

# Windham School District



## ***Math K-8 Curriculum***

Approved by the Windham School Board on 7/12/2022

# WINDHAM SCHOOL DISTRICT

## Math

### TEAM

All of the math teachers, K-12, participated in the mathematics curriculum by reading, writing, offering input, and editing the mathematics curriculum. This collaboration was extremely valuable.

A special thank you to the following teachers who also took time out of their summer vacation to help lead the mathematics curriculum review:

Jessica Benson	GBS	Sara Whitney	GBS
Judiann Burzlaff	GBS	Robert Hemmer	WCS
Jamie Carrier	GBS	Alex krishnamoorthy	WCS
Danielle Catabia	GBS	Jordan Lemay	WCS
Cindy Clemons	GBS	Ashley Clemons	WMS
Anne Connors	GBS	Jessica Cyr	WMS
Janet Dancy	GBS	Leah Doughty	WMS
Lisa Iannuzzi	GBS	Cathy Croteau	WHS
Becky Schneider	GBS	Stephen Latvis	WHS
Doug Stahlheber	GBS	Amit Sharma	WHS
Erin Russell	GBS	Shannan McKenna	SAU

## Mission Statement

The Windham School District K-12 Mathematics Curriculum has undergone a formal review and revision during the 2021-2022 school year. Previously, the mathematics curriculum was approved in April 2018. Mathematics teachers, representing all grade levels, worked together to revise the math curriculum to ensure that it is a comprehensive math curriculum incorporating both the Common Core State Standards as well as Local Windham School District Standards. There was also a vertical review of core mastery standards to ensure that teachers are emphasizing the same key concepts through a spiral review format. This will help ensure that students are prepared for both state assessments as well as the following grade level or course.

There are three versions of the Windham K-12 Math Curriculum. By grade level or course, there is a summary overview section followed by a more detailed version of the curriculum. The summary overview section gives both parents and teachers a quick list of the concepts to be taught, which includes both vocabulary and skills that will be learned. The second detailed version of the curriculum also includes essential questions and the formal list of Common Core Standards. At the end of this document, there is also a mastery overview document. This document shows the concepts and skills, per grade level or course, that will be emphasized, reviewed, and assessed multiple times throughout the school year.

Title of Curriculum: Kindergarten Mathematics

Unit Name	What (content, vocab)	Why (enduring understandings)	How (skills)
<b>Place Value:</b> <b>Numbers and Operations in Base 10</b>	<ul style="list-style-type: none"> <li>● Numbers 11 to 19</li> <li>● Vocabulary: how many more?</li> <li>● Tens and ones</li> <li>● Relationship between whole and parts</li> <li>● Counting on</li> <li>● 10 can be added to another digit to make a whole number.</li> </ul>	<ul style="list-style-type: none"> <li>● Numbers from 11-19 can be represented as the sum of 10 and some more.</li> <li>● A pattern is a repetition of shapes, numbers, or any item selected. These patterns can be used to help solve problems.</li> </ul>	<ul style="list-style-type: none"> <li>● Identify the value of a digit in a 2 digit number (11-19)</li> <li>● Use ten frames to understand base ten</li> <li>● Identify symbols +, -, and = in equations</li> <li>● Count on from a number to find how many in all.</li> <li>● Put parts together to find a whole and taking a whole apart to find parts.</li> </ul>
<b>Operations and Algebraic Thinking:</b> <b>Addition and Subtraction</b>	<ul style="list-style-type: none"> <li>● Vocabulary: in all, join, addition sentence, add, equal, equation, sum, left, separate, subtraction sentence, take away, subtract, difference.</li> <li>● Symbols: Plus sign (+), equal sign (=) minus sign (-)</li> <li>● Adding is joining 2 numbers or groups, subtracting is taking apart</li> <li>● The addition symbol can be read as “plus” or “and.”</li> <li>● The minus sign can be read as “take away.”</li> <li>● The equal sign symbol can be read as “equals” or “is” or “same as”.</li> <li>● Equations can be written with addends before the sum or the sum before the addends.</li> <li>● Fact families</li> </ul>	<ul style="list-style-type: none"> <li>● Addition and subtraction can be shown in many different ways. These include putting together, taking apart, separating, and pattern building.</li> <li>● Subtraction equations using - and = can be used to show subtraction situations.</li> <li>● Equations using plus signs and equal signs can be used to show parts of a whole.</li> <li>● The ability to solve problems is the heart of mathematics.</li> </ul>	<ul style="list-style-type: none"> <li>● Demonstrate fluency of addition and subtraction facts (0 to 5).</li> <li>● Represent addition and subtraction (6 to 10) with objects, fingers, mental images, and drawings.</li> <li>● Solve addition and subtraction word problems.</li> <li>● Decompose numbers (0 to 10) into pairs in more than one way by using objects or drawings.</li> </ul>
<b>Counting and Cardinality:</b> <b>Counting and Ordering Numbers</b>	<ul style="list-style-type: none"> <li>● Numbers and counting 0 to 100</li> <li>● The name and formation for each number 0 to 10.</li> <li>● Counting begins with zero.</li> </ul>	<ul style="list-style-type: none"> <li>● There is a unique symbol that goes with each number word.</li> <li>● There is more than one way to show a number.</li> </ul>	<ul style="list-style-type: none"> <li>● Count to find how many objects and write the number 0 to 20.</li> <li>● Count to 100 by ones and tens.</li> <li>● Counting forward from any given number to 100.</li> </ul>

	<ul style="list-style-type: none"> <li>● Meaning of greater than, less than, and equal groups</li> <li>● 1:1 correspondence when counting</li> </ul>	<ul style="list-style-type: none"> <li>● There is a specific order to the set of whole numbers.</li> <li>● Zero is a number that tells how many objects there are when there are none.</li> <li>● Counting tells the total number in a group no matter which order the objects are counted.</li> <li>● Two groups of objects are equal if they can be directly matched, one-to-one, with no extras in either group.</li> </ul>	<ul style="list-style-type: none"> <li>● Identify and compare numbers, between 1 and 10, in terms of greater than, less than or equal.</li> </ul>
<b>Geometry</b>	<ul style="list-style-type: none"> <li>● Two-dimensional shapes (squares, circles, triangles, rectangles, and hexagons)</li> <li>● Three-dimensional shapes (cubes, cones, cylinders, and spheres)</li> <li>● Describe position of objects using <i>above, below, beside, in front of, behind, next to</i>.</li> <li>● Objects can be described, classified, analyzed, compared, and created by their attributes.</li> </ul>	<ul style="list-style-type: none"> <li>● Shapes are everywhere in our world.</li> <li>● Objects can be classified into two categories, based on whether they have or do not have particular attributes.</li> </ul>	<ul style="list-style-type: none"> <li>● Describe objects using names of shapes.</li> <li>● Identify two and three-dimensional shapes.</li> <li>● Name shapes using attributes.</li> <li>● Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g. number of sides and vertices) and other attributes (e.g. having sides of equal length).</li> <li>● Construct shapes using various materials.</li> <li>● Describe relative position of objects using positional words.</li> <li>● Name shapes regardless of their overall size or orientation.</li> <li>● Compose simple shapes to form larger shapes (e.g join two triangles to make a rectangle).</li> </ul>
<b>Measurement and Data</b>	<ul style="list-style-type: none"> <li>● Vocabulary: category, classify, chart, tally mark</li> </ul>	<ul style="list-style-type: none"> <li>● Measuring identifies how long things are, how much things are, how much they weigh, and how much they hold.</li> </ul>	<ul style="list-style-type: none"> <li>● Describe measurable attributes of objects, such as length or weight.</li> <li>● Describe several measurable attributes of a single object.</li> </ul>

	<ul style="list-style-type: none"> <li>● objects have measurable attributes, such as length or weight, that can be recognized and described.</li> <li>● objects can have similar measurable attributes.</li> <li>● objects can be sorted and classified by attribute</li> <li>● objects in a group can be counted, sorted and compared</li> </ul>	<ul style="list-style-type: none"> <li>● Objects can be classified into two categories, based on whether they have or do not have particular attributes.</li> </ul>	<ul style="list-style-type: none"> <li>● Compare two objects with a measurable attribute in common to see which object has more of / less of a given attribute and describe the difference.</li> <li>● Classify objects into categories.</li> <li>● Sort and classify objects by attribute.</li> <li>● Count the number of objects in each category and sort the categories by how many objects (0 to 10) are in each category (e.g. 2 circles, 1 triangle, 3 rectangles).</li> <li>● Use tally marks to count.</li> <li>● Chart data</li> </ul>
--	---	---	--

# Windham School District Curriculum Mathematics - Kindergarten

## Unit #1: Place Value: Numbers and Operations in Base 10

Stage 1 Desired Results			
<p>ESTABLISHED GOALS: Students will begin their formal study of mathematics. In this unit, students will build a foundation for understanding place value by focusing on composing and decomposing numbers 11 - 19 into a group of 10 ones and some additional ones. To help visualize this, students will use objects, drawings and equations.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● <i>K.NBT.A.1</i> Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (such as <math>18 = 10 + 8</math>); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones</li> </ul>	<i>Transfer</i>		
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● correctly form and identify numbers in mathematics.</li> <li>● use base 10 when counting and composing higher numbers to 100.</li> <li>● use 1:1 correspondence, understanding of base 10, and number naming fluency to build skills of addition, subtraction, story problem comprehension, etc.</li> </ul>		
	<i>Meaning</i>		
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;"> <p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Numbers from 11-19 can be represented as the sum of 10 and some more.</li> <li>● A pattern is a repetition of shapes, numbers, or any items selected. These patterns can be used to help solve problems.</li> </ul> </td> <td style="width: 50%; padding: 5px;"> <p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● How does knowing that teen numbers are made of ten and more help me to know the number?</li> <li>● Why can I start with any number and continue counting?</li> <li>● Why do we count in increasing order?</li> <li>● Where have I seen these numbers in my life?</li> <li>● Why do I need to count how many?</li> <li>● How can I show ways to make 11, 12, 13, 14, 15, 16, 17, 18, 19, or 20?</li> <li>● Why do you need to count in order?</li> <li>● How can one problem help me to solve another?</li> </ul> </td> </tr> </table>	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Numbers from 11-19 can be represented as the sum of 10 and some more.</li> <li>● A pattern is a repetition of shapes, numbers, or any items selected. These patterns can be used to help solve problems.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● How does knowing that teen numbers are made of ten and more help me to know the number?</li> <li>● Why can I start with any number and continue counting?</li> <li>● Why do we count in increasing order?</li> <li>● Where have I seen these numbers in my life?</li> <li>● Why do I need to count how many?</li> <li>● How can I show ways to make 11, 12, 13, 14, 15, 16, 17, 18, 19, or 20?</li> <li>● Why do you need to count in order?</li> <li>● How can one problem help me to solve another?</li> </ul>
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Numbers from 11-19 can be represented as the sum of 10 and some more.</li> <li>● A pattern is a repetition of shapes, numbers, or any items selected. These patterns can be used to help solve problems.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● How does knowing that teen numbers are made of ten and more help me to know the number?</li> <li>● Why can I start with any number and continue counting?</li> <li>● Why do we count in increasing order?</li> <li>● Where have I seen these numbers in my life?</li> <li>● Why do I need to count how many?</li> <li>● How can I show ways to make 11, 12, 13, 14, 15, 16, 17, 18, 19, or 20?</li> <li>● Why do you need to count in order?</li> <li>● How can one problem help me to solve another?</li> </ul>	
<i>Acquisition</i>			
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;"> <p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● Numbers 11-19</li> <li>● Vocabulary: how many more?</li> <li>● Tens and ones</li> <li>● Relationship between whole and parts</li> <li>● Counting on</li> </ul> </td> <td style="width: 50%; padding: 5px;"> <p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● Identifying the value of a digit in a 2 digit number (11-19)</li> <li>● Adding 10 and another digit to make a whole number.</li> <li>● Using ten frames to understand base ten</li> <li>● Being mindful of symbols in equations</li> <li>● Counting on from 10</li> <li>● Finding parts of a whole</li> </ul> </td> </tr> </table>	<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● Numbers 11-19</li> <li>● Vocabulary: how many more?</li> <li>● Tens and ones</li> <li>● Relationship between whole and parts</li> <li>● Counting on</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● Identifying the value of a digit in a 2 digit number (11-19)</li> <li>● Adding 10 and another digit to make a whole number.</li> <li>● Using ten frames to understand base ten</li> <li>● Being mindful of symbols in equations</li> <li>● Counting on from 10</li> <li>● Finding parts of a whole</li> </ul>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● Numbers 11-19</li> <li>● Vocabulary: how many more?</li> <li>● Tens and ones</li> <li>● Relationship between whole and parts</li> <li>● Counting on</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● Identifying the value of a digit in a 2 digit number (11-19)</li> <li>● Adding 10 and another digit to make a whole number.</li> <li>● Using ten frames to understand base ten</li> <li>● Being mindful of symbols in equations</li> <li>● Counting on from 10</li> <li>● Finding parts of a whole</li> </ul>		

	<ul style="list-style-type: none"> <li>• 10 can be added to another digit to make a whole number.</li> </ul>	
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
<i>not applicable</i>		<ul style="list-style-type: none"> <li>• Problem solving</li> <li>• Communication</li> <li>• Perseverance</li> </ul>

### Stage 2 - Evidence

<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	ASSESSMENT: Written Assessments or Projects
	Other Evidence: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Kindergarten

### Unit 2: Operations & Algebraic Thinking - Addition & Subtraction

Stage 1 Desired Results					
<p>ESTABLISHED GOALS: Students will continue their study of mathematics. In this unit, Students will gain an understanding that addition is “putting together” and subtraction is “taking apart”. Students will learn to represent and solve addition and subtraction word problems, decompose numbers, and fluently add and subtract within 5.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● K.OA.A.1 Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.</li> <li>● K.OA.A.2 Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.</li> <li>● K.OA.A.3 Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., <math>5 = 2 + 3</math> and <math>5 = 4 + 1</math>).</li> <li>● K.OA.A.4 For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.</li> <li>● K.OA.A.5 Fluently add and subtract within 5.</li> </ul>	<i>Transfer</i>				
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● add and subtract to solve more complex equations.</li> <li>● add and subtract to find differences in daily life.</li> <li>● add and subtract to complete fact families.</li> </ul>				
	<i>Meaning</i>				
	<table border="1"> <thead> <tr> <th>ENDURING UNDERSTANDINGS</th> <th>ESSENTIAL QUESTIONS</th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> <li>● Addition and subtraction can be shown in many different ways. These include putting together, taking apart, separating, and pattern building.</li> <li>● Subtraction equations using - and = can be used to show subtraction situations.</li> <li>● Equations using plus signs and equal signs can be used to show parts of a whole.</li> <li>● The ability to solve problems is the heart of mathematics.</li> </ul> </td> <td> <ul style="list-style-type: none"> <li>● Why doesn't the order numbers in an addition number sentence matter?</li> <li>● Why does the order of numbers in a subtraction number sentence matter?</li> <li>● Why does the number sentence show equal groups?</li> <li>● When do you need to put things together?</li> <li>● When do you need to take groups apart?</li> <li>● Do math symbols help you understand equations?</li> <li>● Why do growing patterns help us solve addition and subtraction problems?</li> <li>● How can math tools help me solve equations?</li> <li>● How can I use objects to show subtraction?</li> <li>● What are ways to separate 10, 9, 8, 7, 6, 5, 4, 3, 2 or 1?</li> <li>● What are ways to take away from 10, 9, 8, 7, 6, 5, 4, 3, 2 or 1?</li> </ul> </td> </tr> </tbody> </table>	ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS	<ul style="list-style-type: none"> <li>● Addition and subtraction can be shown in many different ways. These include putting together, taking apart, separating, and pattern building.</li> <li>● Subtraction equations using - and = can be used to show subtraction situations.</li> <li>● Equations using plus signs and equal signs can be used to show parts of a whole.</li> <li>● The ability to solve problems is the heart of mathematics.</li> </ul>	<ul style="list-style-type: none"> <li>● Why doesn't the order numbers in an addition number sentence matter?</li> <li>● Why does the order of numbers in a subtraction number sentence matter?</li> <li>● Why does the number sentence show equal groups?</li> <li>● When do you need to put things together?</li> <li>● When do you need to take groups apart?</li> <li>● Do math symbols help you understand equations?</li> <li>● Why do growing patterns help us solve addition and subtraction problems?</li> <li>● How can math tools help me solve equations?</li> <li>● How can I use objects to show subtraction?</li> <li>● What are ways to separate 10, 9, 8, 7, 6, 5, 4, 3, 2 or 1?</li> <li>● What are ways to take away from 10, 9, 8, 7, 6, 5, 4, 3, 2 or 1?</li> </ul>
ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS				
<ul style="list-style-type: none"> <li>● Addition and subtraction can be shown in many different ways. These include putting together, taking apart, separating, and pattern building.</li> <li>● Subtraction equations using - and = can be used to show subtraction situations.</li> <li>● Equations using plus signs and equal signs can be used to show parts of a whole.</li> <li>● The ability to solve problems is the heart of mathematics.</li> </ul>	<ul style="list-style-type: none"> <li>● Why doesn't the order numbers in an addition number sentence matter?</li> <li>● Why does the order of numbers in a subtraction number sentence matter?</li> <li>● Why does the number sentence show equal groups?</li> <li>● When do you need to put things together?</li> <li>● When do you need to take groups apart?</li> <li>● Do math symbols help you understand equations?</li> <li>● Why do growing patterns help us solve addition and subtraction problems?</li> <li>● How can math tools help me solve equations?</li> <li>● How can I use objects to show subtraction?</li> <li>● What are ways to separate 10, 9, 8, 7, 6, 5, 4, 3, 2 or 1?</li> <li>● What are ways to take away from 10, 9, 8, 7, 6, 5, 4, 3, 2 or 1?</li> </ul>				

<b>Acquisition</b>	
	<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● Vocabulary: in all, join, addition sentence, add, equal, equation, sum, left, separate, subtraction sentence, take away, subtract, difference.</li> <li>● Symbols: Plus sign (+), equal sign (=) minus sign (-)</li> <li>● Adding is joining 2 numbers or groups, subtracting is taking apart</li> <li>● The addition symbol can be read as “plus” or “and.”</li> <li>● The minus sign can be read as “take away.”</li> <li>● The equal sign symbol can be read as “equals” or “is” or “same as”.</li> <li>● Equations can be written with addends before the sum or the sum before the addends.</li> <li>● Fact families</li> </ul>
	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● Identifying the value of a digit in a 2 digit number (11-19).</li> <li>● Using ten frames to understand base ten.</li> <li>● Identifying symbols +, -, = in equations.</li> <li>● Counting on from to find how many in all.</li> <li>● Putting parts together to make a whole and taking a whole apart to find parts.</li> <li>● Using patterns to develop fluency</li> <li>● Demonstrating fluency of addition and subtraction facts (0 - 5).</li> <li>● Representing addition and subtraction with objects (6 - 10) fingers, mental images, drawings, and sounds.</li> <li>● Solving addition and subtraction word problems.</li> <li>● Decomposing numbers 0 -10 into pairs in more than one way by using objects and drawings and equations</li> </ul>
<b>Used in Content Area Standards</b>	<b>21<sup>st</sup> Century Skills</b>
<i>not applicable</i>	<ul style="list-style-type: none"> <li>● Problem solving</li> <li>● Communication</li> <li>● Perseverance</li> </ul>

## Stage 2 - Evidence

<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Kindergarten

### Unit 3: Counting & Cardinality - Counting & Ordering Numbers

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics. In this unit, students will learn to write, identify and count objects in a variety of arrangements, and understand the quantity of a group in order to compare groups to find greater than, less than and equal to.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● K.CC.A.1 Count to 100 by ones and by tens.</li> <li>● K.CC.A.2 Count forward beginning from a given number within the known sequence (instead of having to begin at 1).</li> <li>● K.CC.A.3 Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects)</li> <li>● K.CC.B.4 Understand the relationship between numbers and quantities; connect counting to cardinality</li> <li>● K.CC.B.5 Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1-20, count out that many objects.</li> <li>● K.CC.C.6 Identify whether the number of objects in one group is greater than, less than, or equal to</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● correctly form and identify numbers in mathematics.</li> <li>● build skills of addition, subtraction, story problem comprehension, etc. by using 1:1 correspondence, comparing numbers, and number names.</li> </ul>	
	<i>Meaning</i>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● There is a unique symbol that goes with each number word.</li> <li>● There is more than one way to show a number.</li> <li>● There is a specific order to the set of whole numbers.</li> <li>● Zero is a number that tells how many objects there are when there are none.</li> <li>● Counting tells the total number in a group no matter which order the objects are counted.</li> <li>● Two groups of objects are equal if they can be directly matched, one-to-one, with no extras in either group.</li> <li>● Counting helps us solve problems in our lives.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● Why do I need to count how many?</li> <li>● Why do you need to count in order?</li> <li>● Can we count how many objects no matter how we set them up?</li> <li>● Where have I seen numbers in my life?</li> <li>● Why do we need to know the numbers?</li> <li>● How can I show ways to make 0,1,2,3,4,5,6, 7, 8, 9, or 10?</li> <li>● How is zero different from the other numbers?</li> <li>● Why are the groups equal or not equal?</li> </ul>
<i>Acquisition</i>		
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● The name and formation for each number from 0-10</li> <li>● Counting begins with zero</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● Counting to find how many objects and writing the number 0-20.</li> <li>● Counting to 100 by ones and tens.</li> </ul>	

<p>the number of objects in another group, e.g., by using matching and counting strategies.1</p> <ul style="list-style-type: none"> <li>● K.C.C.7 Compare two numbers between 1 and 10 presented as written numerals.</li> </ul>	<ul style="list-style-type: none"> <li>● Meaning of greater than, less than, and equal groups</li> <li>● Vocabulary: total, zero, number, part, whole, group order, compare, equal/equal to, greater than, less than, same number as, not</li> <li>● 1:1 correspondence</li> </ul>	<ul style="list-style-type: none"> <li>● Counting forward from any given number to 100.</li> <li>● Identifying and comparing numbers, between 1 and 10, in terms of greater than, less than or equal to.</li> </ul>
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
<i>not applicable</i>		<ul style="list-style-type: none"> <li>● Problem solving</li> <li>● Communication</li> <li>● Perseverance</li> </ul>

### Stage 2 - Evidence

<i>Evaluative Criteria</i>	<i>Assessment Evidence</i>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Kindergarten

### Unit 4: Geometry

#### Stage 1 Desired Results

<p><b>ESTABLISHED GOALS:</b> Students will continue their study of mathematics. In this unit, students will identify two and three dimensional shapes as well as analyze and compare various shapes by their attributes.</p> <p><b>Content Standards:</b></p> <ul style="list-style-type: none"> <li>● CCSS.MATH.CONTENT.K.G.A.1 Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind, and next to.</li> <li>● CCSS.MATH.CONTENT.K.G.A.2 Correctly name shapes regardless of their orientations or overall size.</li> <li>● CCSS.MATH.CONTENT.K.G.A.3 Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid").</li> <li>● CCSS.MATH.CONTENT.K.G.B.4 Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length).</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● name and recognize shapes in their authentic forms and within their environment</li> <li>● compare and sort shapes by kind</li> </ul>	
	<i>Meaning</i>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Shapes are everywhere in our world.</li> <li>● Objects can be classified into two categories, based on whether they have or do not have particular attributes.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● How do shapes make up our world?</li> </ul>
	<i>Acquisition</i>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● Two-dimensional shapes (squares, circles, triangles, rectangles, hexagons)</li> <li>● Three-dimensional shapes (cubes, cones, cylinders, spheres)</li> <li>● Positional words such as <i>above, below, beside, in front of, behind, next to</i>, to describe an object's location.</li> <li>● objects can be described, classified, analyzed, compared, and created by their attributes.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● describing objects in the environment using names of shapes.</li> <li>● identifying two-dimensional and three-dimensional shapes.</li> <li>● naming shapes using attributes.</li> <li>● analyzing and comparing two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g. number of sides and vertices) and other attributes (e.g., having sides of equal length).</li> <li>● constructing shapes using various materials (e.g. sticks and clay balls), and draw shapes.</li> </ul>	

<ul style="list-style-type: none"> <li>● CCSS.MATH.CONTENT.K.G.B.5 Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.</li> <li>● CCSS.MATH.CONTENT.K.G.B.6 Compose simple shapes to form larger shapes. For example, "Can you join these two triangles with full sides touching to make a rectangle?"</li> </ul>		<ul style="list-style-type: none"> <li>● describing the relative position of objects using positional words.</li> <li>● naming shapes regardless of their orientations or overall size.</li> <li>● composing simple shapes to form larger shapes. (For example, "Can you join these two triangles with full sides touching to make a rectangle?").</li> </ul>
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
<i>not applicable</i>		<ul style="list-style-type: none"> <li>● Problem solving</li> <li>● Communication</li> <li>● Perseverance</li> </ul>

### Stage 2 - Evidence

<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	ASSESSMENT: Written Assessments or Projects
	Other Evidence: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Kindergarten

### Unit 5: Measurement & Data

Stage 1 Desired Results		
<p><b>ESTABLISHED GOALS:</b> Students will continue their study of mathematics. In this unit, students will be able to measure an object's length, width, height and volume and compare these attributes to those of other objects.</p> <p><b>Content Standards:</b></p> <ul style="list-style-type: none"> <li>● K.MD.A.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.</li> <li>● K.MD.A.2 Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference. For example, directly compare the heights of two children and describe one child as taller/shorter.</li> <li>● K.MD.B.3 Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● understand differences in objects based on size.</li> <li>● use charts to understand data (how many more, how many fewer, which is the most? which is the least? etc.)</li> </ul>	
	<i>Meaning</i>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Measuring identifies how long things are, how much they weigh, and how much they hold.</li> <li>● Objects can be classified into two categories, based on whether they have or do not have particular attributes.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● Can all things be measured?</li> <li>● How do we use measurement every day?</li> <li>● Why do we measure things?</li> <li>● How many ways can you sort a group of objects?</li> <li>● How can classifying data help to answer questions?</li> <li>● Why do we chart our data?</li> </ul>
<i>Acquisition</i>		
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● Vocabulary: category, classify, chart, tally mark</li> <li>● objects have measurable attributes, such as length or weight, that can be recognized and described.</li> <li>● objects can have similar measurable attributes.</li> <li>● objects can be sorted and classified by attribute.</li> <li>● objects in a group can be counted, sorted and compared.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● describing measurable attributes of objects, such as length or weight.</li> <li>● describing several measurable attributes of a single object.</li> <li>● comparing two objects with a measurable attribute in common to see which object has more of/less of a given attribute and describe the difference.</li> <li>● classifying objects into categories.</li> </ul>	

		<ul style="list-style-type: none"> <li>● sorting and classifying objects by attribute.</li> <li>● counting the number of objects in each category and sorting the categories by how many objects (0 to 10) are in each category (e.g. 2 circles, 1 triangle, 3 rectangles).</li> <li>● using tally marks to count.</li> <li>● charting data using real life objects and pictographs.</li> </ul>
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
<i>not applicable</i>		<ul style="list-style-type: none"> <li>● Problem solving</li> <li>● Communication</li> <li>● Perseverance</li> </ul>

### Stage 2 - Evidence

<i>Evaluative Criteria</i>	<i>Assessment Evidence</i>
	ASSESSMENT: Written Assessments or Projects
	Other Evidence: independent practice, classroom observations and discussions

Title of Curriculum: Grade 1 Mathematics

Unit Name	What (content, vocab)	Why (enduring understandings)	How (skills)
<b>Counting</b>	<ul style="list-style-type: none"> <li>● Counting follows a sequence</li> <li>● Numbers represent an object (1:1 correspondence)</li> <li>● Numbers 1-120</li> <li>● Numbers can be expressed in pictures, objects and numerals</li> </ul>	<ul style="list-style-type: none"> <li>● Counting helps us solve problems in our lives.</li> </ul>	<ul style="list-style-type: none"> <li>● Identify the value of a whole number (0 to 120)</li> <li>● Count by 1s, 2s, 5s, 10s</li> <li>● Order whole number from 0-120</li> <li>● Write whole numbers from 0 -120</li> <li>● Recognize visual representations of numbers (0-120)</li> <li>● Create visual representations using models and written numbers.</li> <li>● Represent a quantity of objects with a numeral</li> <li>● ordering whole numbers (0-120).</li> </ul>
<b>Place Value</b>	<ul style="list-style-type: none"> <li>● Tens and ones</li> <li>● Symbols &lt;, &gt;, and =</li> <li>● 2-digit numbers</li> <li>● Multiples of 10 (10, 20, 30, 40, 50, 60, 70, 80, 90)</li> </ul>	<ul style="list-style-type: none"> <li>● Numbers can be organized by ones and tens.</li> <li>● Place value can help to solve math problems more efficiently.</li> <li>● Place value can be used to compare numbers using symbols.</li> </ul>	<ul style="list-style-type: none"> <li>● Represent ten ones as a bundle called “ten”.</li> <li>● Identify the digit in the tens and ones places in a given two digit number.</li> <li>● Identify the value of each digit within a 2-digit number</li> <li>● Use mental math to add groups of 10 to a number</li> <li>● Compare two-digit numbers using &lt;, &gt;, =</li> <li>● add within 100, including adding a two-digit number and a one digit number (23+7=30), and adding a two-digit number and a multiple of 10 (23+20=43).</li> <li>● understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.</li> <li>● mentally finding ten more and ten less than a given two-digit number without having to count and explain reasoning.</li> <li>● subtracting multiples of 10 in the range of 10-90 from multiples of 10 in the range 10-90 (positive or zero differences).</li> </ul>

			<ul style="list-style-type: none"> <li>relating strategies used to add or subtract two two-digit numbers to a written method and explain reasoning used</li> </ul>
<b>Addition and Subtraction</b>	<ul style="list-style-type: none"> <li>Addition and subtraction</li> <li>Drawings, symbols, equations</li> <li>Numbers 1- 20</li> <li>Properties of addition and subtraction</li> </ul>	<ul style="list-style-type: none"> <li>Addition and subtraction can be shown in many different ways, including putting together, taking apart and separating.</li> </ul>	<ul style="list-style-type: none"> <li>Use addition and subtraction within 20 to solve problems, including word problems (adding to, taking from, putting together, taking apart, comparing) by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.</li> <li>Solve word problems using addition of three whole numbers whose sum is less than or equal to 20.</li> <li>Fluently add and subtract facts within 10</li> <li>Determine the unknown number in an addition or subtraction equation relating to three whole numbers (<math>8+?=10</math>).</li> </ul>
<b>Geometry</b>	<ul style="list-style-type: none"> <li>2-D and 3-D shapes</li> <li>Equal shares of a whole</li> </ul>	<ul style="list-style-type: none"> <li>Shapes are everywhere in our world.</li> <li>A whole can be divided into equal shares.</li> <li>Addition and subtraction can be represented by models &amp; equal equations.</li> </ul>	<ul style="list-style-type: none"> <li>Distinguish between defining and non-defining attributes</li> <li>Build and draw shapes with defining attributes</li> <li>composing (making) two-dimensional shapes to create a composite shape (e.g. two trapezoids to create a hexagon).</li> <li>Compose three-dimensional shapes (e.g. 6 squares to create a cube)</li> <li>Compare new shapes made from composite shapes</li> <li>Partition circles and rectangles into two and four equal shares</li> <li>Describing two and four equal shares using the words halves, fourths, and quarters, and use the phrases half of, fourth of, and quarter of.</li> </ul>
<b>Measurement and Data</b>	<ul style="list-style-type: none"> <li>Length</li> <li>Tools for measurement</li> <li>Data</li> </ul>	<ul style="list-style-type: none"> <li>Measuring objects allows us to compare the size of objects.</li> </ul>	<ul style="list-style-type: none"> <li>measuring and recording the length of an object using same size units that span the object with no gaps or overlaps. expressing the length of an</li> </ul>

	<ul style="list-style-type: none"> <li>● Graphs, charts, pictures</li> <li>● Graphing categories</li> <li>● Analog clock</li> <li>● Digital clock</li> <li>● Hour hand</li> <li>● Minute hand</li> </ul>	<ul style="list-style-type: none"> <li>● Data and graphs are used to make decisions and solve problems.</li> <li>● Time can be measured in a variety of forms including to the nearest hour and half hour.</li> </ul>	<p>object by stating the length as a whole number of units (5 same size pencils) by laying multiple copies of a shorter object end to end.</p> <ul style="list-style-type: none"> <li>● comparing the lengths of two objects indirectly by using a third object (a pencil, a shoe, a cube).</li> <li>● measuring the length of an object using same size units that span the object with no gaps or overlaps.</li> <li>● ordering three objects by length.</li> <li>● organizing and representing data with up to three categories (Pets: dog, cat, bird).</li> <li>● interpreting data with up to three categories.</li> <li>● asking and answering questions about the total number of data points: How many in each category? How many more or less are in one category than in another?</li> <li>● telling and writing time to the hour and half-hour using analog and digital clocks.</li> </ul>
--	--	---	---

# Windham School District Curriculum

## Mathematics - Grade 1

### Unit 1: Counting

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics. In this unit, students will be able to count sequentially, read and write numbers correctly, and recognize visual representations of numbers.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.1.NBT.A. 1. Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.</li> <li>CCSS.MP.4 Model with mathematics.</li> <li>● CCSS.MP.6 Attend to precision.</li> <li>● CCSS.MP.7 Look for and make use of structure.</li> <li>● CCSS.MP.8 Look for and express regularity in repeated reasoning</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● Recognize the value and order of numbers</li> <li>● Create and recognize visual representations of numbers</li> </ul>	
	<i>Meaning</i>	
	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● Counting helps us solve problems in our lives.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● What can numbers represent?</li> <li>● How can numbers be represented using symbols, words and tools?</li> <li>● Why do we need numbers?</li> </ul>
	<i>Acquisition</i>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● counting follows a sequence.</li> <li>● numbers represent an object (1:1 correspondence).</li> <li>● Numbers 1-120.</li> <li>● understand numbers can be expressed in pictures, objects and numerals.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● identifying the value of a whole number (0 to 120).</li> <li>● counting forward by 1, 2, 5, 10s (0 to 120).</li> <li>● writing whole numbers (0 to 120).</li> <li>● recognizing visual representations of numbers (0 to 120).</li> <li>● creating visual representation using models and written numbers (0 to 120).</li> <li>● ordering whole numbers (0 to 120).</li> <li>● Representing a quantity of objects with a number.</li> </ul>	
<i>Used in Content Area Standards</i>	<i>21<sup>st</sup> Century Skills</i>	
<i>not applicable</i>	<ul style="list-style-type: none"> <li>● Problem Solving</li> <li>● Communication</li> <li>● Perseverance</li> </ul>	

## Stage 2 - Evidence

<i>Evaluative Criteria</i>	<i>Assessment Evidence</i>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 1

### Unit 2: Place Value

Stage 1 Desired Results		
<p><b>ESTABLISHED GOALS:</b> Students will continue their study of mathematics. In this unit, students will learn to organize numbers based on ones and tens. They will be able to compare numbers using symbols. Students' understanding of place value will help them to solve math problems more efficiently.</p> <p><b>Content Standards:</b></p> <ul style="list-style-type: none"> <li>● CCSS.1.NBT.B. 2. Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases: - 10 can be thought of as a bundle of ten ones – called a “ten”. - The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones. - The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).</li> <li>● CCSS.1.NBT.B.3. Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols <math>&gt;</math>, <math>=</math>, and <math>&lt;</math>. Use place value understanding and properties of operations to add and subtract.</li> <li>● CCSS.1.NBT.C.4. Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10 using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and</li> </ul>	<b>Transfer</b>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● Make sense of and solve various math problems and real life problems</li> <li>● Recognize the value and order of numbers</li> <li>● Use appropriate tools strategically</li> <li>● Create and recognize visual representations of numbers</li> </ul>	
	<b>Meaning</b>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Numbers can be organized by ones and tens</li> <li>● Place value can help to solve math problems more efficiently.</li> <li>● Place value can be used to compare numbers using symbols.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● How does understanding place value help us to compare and order numbers?</li> <li>● How can knowing the value of a number help us to make decisions?</li> <li>● Why are zero and ten important?</li> </ul>
<b>Acquisition</b>		
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● two digits of a 2-digit number represents amounts of tens and ones.</li> <li>● symbols <math>&lt;</math>, <math>&gt;</math>, and <math>=</math> can be used to compare numbers</li> <li>● value of zero in a multiple of 10 (10, 20, 30, 40, etc).</li> <li>● meaning of base-ten and its use for solving number and real life</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● representing ten ones as a bundle called “ten”.</li> <li>● identifying the digit in the tens and one places in a given two-digit number.</li> <li>● identifying the value of each digit within a 2-digit number.</li> <li>● Using mental math to add groups of 10 to a number.</li> <li>● comparing two two-digit numbers using <math>&lt;</math>, <math>&gt;</math>, and <math>=</math>.</li> </ul>	

<p>subtraction; relate the strategy to a written method and explain the reasoning used.</p> <ul style="list-style-type: none"> <li>● CCSS.1.NBT.C. 5. Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.</li> <li>● CCSS.1.NBT.C. 6. Subtract multiples of 10 in the range 10 to 90 from multiples of 10 in the range 10 to 90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. CCSS.MP1 Make sense of problems and persevere in solving them.</li> <li>● CCSS.MP4 Model with mathematics.</li> <li>● CCSS.MP6 Attend to precision.</li> <li>● CCSS.MP7 Look for and make use of structure.</li> <li>● CCSS.MP8 Look for and express regularity in repeated reasoning.</li> </ul>	<p>problems (addition, subtraction, comparison).</p>	<ul style="list-style-type: none"> <li>● adding within 100, including adding a two-digit number and a one digit number (<math>23+7=30</math>), and adding a two-digit number and a multiple of 10 (<math>23+20=43</math>).</li> <li>● understanding that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.</li> <li>● mentally finding ten more and ten less than a given two-digit number without having to count and explain reasoning.</li> <li>● subtracting multiples of 10 in the range of 10 to 90 from multiples of 10 in the range 10 to 90 (positive or zero differences).</li> <li>● relating strategies used to add or subtract two two-digit numbers to a written method and explain reasoning used</li> </ul>
<p><b>Used in Content Area Standards</b></p>		<p><b>21<sup>st</sup> Century Skills</b></p>
<p><i>not applicable</i></p>		<ul style="list-style-type: none"> <li>● Problem Solving</li> <li>● Communication</li> <li>● Perseverance</li> </ul>

### Stage 2 - Evidence

<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	ASSESSMENT: Written Assessments or Projects
	Other Evidence: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 1

### Unit 3: Addition & Subtraction

#### Stage 1 Desired Results

<p>ESTABLISHED GOALS: Students will continue their study of mathematics. In this unit, students will be able to use multiple strategies to solve addition and subtraction word problems. Students will demonstrate fluency in addition and subtraction problems within 10.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.1.OA.A.1. Use addition and subtraction within 20 to solve word problems involving situations of adding to taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.</li> <li>● CCSS.1.OA.A.2. Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. Understand and apply properties of operations and the relationship between addition and subtraction.</li> <li>● CCSS.1.OA.B.3. Apply properties of operations as strategies to add and subtract. 3 Examples: If <math>8+3=11</math> is known, then <math>3+8=11</math> is also known. (Commutative property of addition.) To add <math>2+6+4</math>, the second two numbers can be added to make a ten, so <math>2+6+4=2+10=12</math>. (Associative property of addition.)</li> <li>● CCSS.1.OA.B. 4. Understand subtraction as an unknown-addend problem. For example, subtract <math>10-8</math> by finding the number that makes 10 when added to 8.</li> <li>● CCSS.1.OA.C.5. Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).</li> </ul>	<b>Transfer</b>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● Apply addition and subtraction strategies to solve problems in everyday life.</li> </ul>	
	<b>Meaning</b>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Addition and subtraction can be shown in many different ways including putting together, taking apart, and separating.</li> <li>● Addition and subtraction can be represented by models and equations.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● How do addition and subtraction help me function in my world?</li> <li>● How does comparing numbers help us solve problems?</li> </ul>
	<b>Acquisition</b>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● multiple ways to solve addition and subtraction equations with whole numbers.</li> <li>● addition and subtraction procedures have real world application.</li> <li>● commutative and associative properties of addition and subtraction.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● using addition and subtraction within 20 to solve problems, including word problems (adding to, taking from, putting together, taking apart, comparing) by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.</li> <li>● solving word problems that call for addition of three whole numbers</li> </ul>	

<ul style="list-style-type: none"> <li>● CCSS.1.OA.C. 6 Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., <math>8+6=8+2+4=10+4=14</math>); decomposing a number leading to a ten (e.g., <math>13-4=13-3-1=10-1=9</math>); using the relationship between addition and subtraction (e.g., knowing that <math>8+4=12</math>, one knows <math>12-8=4</math>); and creating equivalent but easier or known sums (e.g., adding <math>6+7</math> by creating the known equivalent <math>6+6+1=12+1=13</math>).</li> <li>● CCSS.1.OA.D.7. Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. For example, which of the following equations are true and which are false? <math>6=6</math>, <math>7=8-1</math>, <math>4+1=5+2</math>. CCSS.</li> <li>● 1.OA.D. 8. Determine the unknown whole number in an addition or subtraction equation relating to three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations <math>8+?=11</math>, <math>5=?+3</math>, <math>6+6=?</math></li> <li>● CCSS.MP1 Make sense of problems and persevere in solving them.</li> <li>● CCSS.MP2 Reason abstractly and quantitatively.</li> <li>● CCSS.MP3 Construct viable arguments and critique the reasoning of others.</li> <li>● CCSS.MP4 Model with mathematics.</li> <li>● CCSS.MP6 Attend to precision.</li> <li>● CCSS.MP7 Look for and make use of structure.</li> </ul>	<ul style="list-style-type: none"> <li>● number models, objects and drawings are various ways to solve problems.</li> <li>● meaning of the symbols and the equal sign within equations.</li> <li>● an unknown number in an equation can be determined by demonstrating the relationship between addition and subtraction</li> </ul>	<p>whose sum is less than or equal to 20.</p> <ul style="list-style-type: none"> <li>● fluently adding and subtracting facts within ten.</li> <li>● determining the unknown number in an addition or subtraction equation relating to three whole numbers (<math>8+?=10</math>).</li> </ul>
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
<i>not applicable</i>		<ul style="list-style-type: none"> <li>● Problem Solving</li> <li>● Communication</li> <li>● Perseverance</li> </ul>

### Stage 2 - Evidence

<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	ASSESSMENT: Written Assessments or Projects
	Other Evidence: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade

### Unit 4: Geometry

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics. In this unit, students will identify two-dimensional and three-dimensional shapes according to defining attributes. Students will be able to partition circles, squares, and rectangles into two and four equal parts, describing those parts as halves, fourths, or quarters.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.1.G.A. 1. Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g. color, orientation, overall size); build and draw shapes to possess defining attributes.</li> <li>● CCSS.1.G.A.2. Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.</li> <li>● CCSS.1.G.A. 3. Partition circles and rectangles into two and four equal shares, describe the shares using the words halves, fourths, and quarters, and use the phrases half of, fourth of, and quarter of. Describe the whole as two of, or four of the shares.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● Divide shapes into equal shares and identify those shares</li> <li>● Recognize shapes in their environment</li> </ul>	
	<i>Meaning</i>	
	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● Shapes are everywhere in our world.</li> <li>● A whole can be divided into equal shares.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● How do shapes make up our world? How is the world of geometry connected to the world of numbers?</li> </ul>
	<i>Acquisition</i>	
	<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● Two and three-dimensional objects can be described, classified and analyzed by their attributes.</li> <li>● The names of two and three-dimensional shapes are based on their attributes.</li> <li>● shapes can be partitioned in equal shares.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● distinguishing between defining (triangles have three sides) and non-defining attributes (color, orientation, overall size).</li> <li>● building and drawing shapes with defining attributes.</li> <li>● composing (making) two-dimensional shapes to create a composite shape (e.g. two trapezoids to create a hexagon).</li> <li>● composing (making) three-dimensional shapes (e.g. 6 squares to create a cube).</li> <li>● comparing new shapes made from composite shapes.</li> <li>● partitioning circles and rectangles into two and four equal shares</li> </ul>

<p>Understand for these examples that decomposing into more equal shares creates smaller shares.</p> <ul style="list-style-type: none"> <li>● CCSS.MP1 Make sense of problems and persevere in solving them.</li> <li>● CCSS.MP4 Model with mathematics.</li> <li>● CCSS.MP5 Use appropriate tools strategically.</li> <li>● CCSS.MP6 Attend to precision.</li> <li>● CCSS.MP7 Look for and make use of structure.</li> </ul>		<ul style="list-style-type: none"> <li>● describing two and four equal shares using the words halves, fourths, and quarters, and use the phrases half of, fourth of, and quarter of.</li> <li>● describing a whole as two of, or four of the shares. (Ex. A whole circle is made of two halves).</li> <li>● demonstrating an understanding that decomposing (taking apart) an object into more equal shares creates smaller shares.</li> </ul>
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
<i>not applicable</i>		<ul style="list-style-type: none"> <li>● Problem Solving</li> <li>● Communication</li> <li>● Perseverance</li> </ul>

### Stage 2 - Evidence

<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 1

### Unit 5: Measurement & Data

Stage 1 Desired Results			
<p><b>ESTABLISHED GOALS:</b> Students will continue their study of mathematics. In this unit, students will make accurate measurements using non-standard units. They will be able to read, create, and ask and answer questions using different types of graphs. Students will also write and tell time to the hour and half hour.</p> <p><b>Content Standards:</b></p> <ul style="list-style-type: none"> <li>● CCSS.1.MD.A. 1. Order three objects by length; compare the lengths of two objects indirectly by using a third object.</li> <li>● CCSS.1.MD.A. 2. Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.</li> <li>● CCSS.1.MD.B. 3. Tell and write time in hours and half-hours using analog and digital clocks.</li> <li>● CCSS.1.MD.C. 4. Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points,</li> </ul>	<i>Transfer</i>		
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● make accurate measurements</li> <li>● order objects from longest to shortest or shortest to longest based on measurement</li> <li>● read different types of graphs in different situations and use the information to make accurate decisions in their lives.</li> <li>● display data in a variety of ways.</li> <li>● look at graphs and charts and explain their meaning and make sense of the data to apply to their everyday lives.</li> <li>● accurately tell and write time to help make decisions.</li> </ul>		
	<i>Meaning</i>		
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Measuring objects allow us to compare the size of objects,</li> <li>● Data and graphs are used to make decisions and solve problems.</li> <li>● Time can be measured in a variety of forms including to the nearest hour and half hour.</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● Can all things be measured?</li> <li>● Why is measuring important?</li> <li>● How can data help us to make decisions and solve problems?</li> <li>● How can time affect the decisions we make?</li> </ul> </td> </tr> </table>	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Measuring objects allow us to compare the size of objects,</li> <li>● Data and graphs are used to make decisions and solve problems.</li> <li>● Time can be measured in a variety of forms including to the nearest hour and half hour.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● Can all things be measured?</li> <li>● Why is measuring important?</li> <li>● How can data help us to make decisions and solve problems?</li> <li>● How can time affect the decisions we make?</li> </ul>
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Measuring objects allow us to compare the size of objects,</li> <li>● Data and graphs are used to make decisions and solve problems.</li> <li>● Time can be measured in a variety of forms including to the nearest hour and half hour.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● Can all things be measured?</li> <li>● Why is measuring important?</li> <li>● How can data help us to make decisions and solve problems?</li> <li>● How can time affect the decisions we make?</li> </ul>	
<i>Acquisition</i>			
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● attributes (e.g. length, height) of objects are measurable and can be quantified using unit amounts.</li> <li>● time can be determined using an analog or a digital clock.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● measuring and recording the length of an object using same size units that span the object with no gaps or overlaps. expressing the length of an object by stating the length as a whole number of units (5 same size pencils) by</li> </ul>		

<p>how many in each category, and how many more or less are in one category than in another.</p> <ul style="list-style-type: none"> <li>● CCSS.MP1 Make sense of problems and persevere in solving them.</li> <li>● CCSS.MP4 Model with mathematics.</li> <li>● CCSS.MP5 Use appropriate tools strategically.</li> <li>● CCSS.MP6 Attend to precision.</li> <li>● CCSS.MP7 Look for and make use of structure.</li> </ul>	<ul style="list-style-type: none"> <li>● the different features of a clock such as hour hand and minute hand.</li> <li>● questions can be answered by collecting and analyzing data.</li> <li>● data represents real world objects and ideas.</li> <li>● data can be represented in different forms (chart, graph, picture).</li> </ul>	<p>laying multiple copies of a shorter object end to end.</p> <ul style="list-style-type: none"> <li>● comparing the lengths of two objects indirectly by using a third object (a pencil, a shoe, a cube).</li> <li>● measuring the length of an object using same size units that span the object with no gaps or overlaps.</li> <li>● ordering three objects by length.</li> <li>● organizing and representing data with up to three categories (Pets: dog, cat, bird).</li> <li>● interpreting data with up to three categories.</li> <li>● asking and answering questions about the total number of data points: How many in each category? How many more or less are in one category than in another?</li> <li>● telling and writing time to the hour and half-hour using analog and digital clocks.</li> </ul>
<p><b>Used in Content Area Standards</b></p>		<p><b>21<sup>st</sup> Century Skills</b></p>
<p><i>not applicable</i></p>		<ul style="list-style-type: none"> <li>● Problem Solving</li> <li>● Communication</li> <li>● Perseverance</li> </ul>

<p><b>Stage 2 - Evidence</b></p>	
<p><b>Evaluative Criteria</b></p>	<p><b>Assessment Evidence</b></p>
	<p>ASSESSMENT: Written Assessments or Projects</p>
	<p>Other Evidence: independent practice, classroom observations and discussions</p>

Title of Curriculum: Grade 2 Mathematics

Unit Name	What (content, vocab)	Why (enduring understandings)	How (skills)
<b>Time and Money</b>	<ul style="list-style-type: none"> <li>● Analog and digital clocks</li> <li>● Hour and minute hand</li> <li>● Coins and bills</li> <li>● \$ and cent symbols</li> </ul>	<ul style="list-style-type: none"> <li>● Time can be given in many forms including to the nearest 5 minutes.</li> <li>● When counting money, it is usually easier to start with the coin with the greater value.</li> <li>● The same amount of money can be represented using different combinations of coins and bills.</li> </ul>	<ul style="list-style-type: none"> <li>● Telling time from analog and digital clock to the nearest five minutes, using a.m. and p.m.</li> <li>● Writing time from analog and digital clock to the nearest five minutes, using a.m. and p.m.</li> <li>● Determining total amount of a collection of various coins (half dollars, quarters, dimes, nickels, pennies).</li> <li>● Showing an amount several different ways using quarters, dimes, nickels and pennies.</li> <li>● Solving word problems involving dollar bills and coins.</li> </ul>
<b>Addition and Subtraction within 20</b>	<ul style="list-style-type: none"> <li>● Addition &amp; subtraction drawings, symbols, equations, properties</li> <li>● Sum, difference</li> <li>● Fact Families</li> <li>● Equal Groups / Arrays</li> <li>● Odd and even</li> </ul>	<ul style="list-style-type: none"> <li>● There are strategies for learning addition and subtraction facts within 20 that will help with fluency. This includes counting on, making ten, and decomposing.</li> </ul>	<ul style="list-style-type: none"> <li>● Solving one- and two- step problems using addition and subtraction within 20 with unknowns in all positions.</li> <li>● demonstrating fluency of addition and subtraction facts within 20., using mental math strategies.</li> <li>● writing fact families that consist of 2 addition and 2 subtraction equations using 3 numerals.</li> <li>● arranging objects in rectangular arrays with up to 5 rows and 5 columns and writing an equation to express the total as a sum of equal addends.</li> </ul>
<b>Addition and Subtraction for Larger Units</b>	<ul style="list-style-type: none"> <li>● Addition and subtraction equations</li> <li>● Regrouping</li> <li>● Composing and decomposing three digit numbers</li> </ul>	<ul style="list-style-type: none"> <li>● Students will use place value understanding and properties of operations to solve two-digit three-digit addition and subtraction equations.</li> <li>● Two digit numbers can be broken apart using tens and ones and added in different ways.</li> </ul>	<ul style="list-style-type: none"> <li>● adding and subtracting numbers within 100 using place value strategies.</li> <li>● breaking apart numbers into tens and ones to find their sums and differences.</li> <li>● explaining their mathematical thinking.</li> <li>● adding up to four 2-digit numbers</li> <li>● understanding addends can be added in any order.</li> <li>● adding 10 or 100 mentally using place value</li> </ul>

		<ul style="list-style-type: none"> <li>• Three-digit numbers can be broken apart using hundreds, tens, and ones and added in different ways.</li> </ul>	<ul style="list-style-type: none"> <li>• adding 3 digit numbers using a variety of strategies such as adding partial sums, compensation, traditional algorithms and mental math.</li> </ul>
<b>Representing and Interpreting Data</b>	<ul style="list-style-type: none"> <li>• Bar graphs, picture graphs and line plots</li> <li>• Data</li> </ul>	<ul style="list-style-type: none"> <li>• Some questions can be answered by collecting and analyzing data.</li> <li>• Data can be represented visually using charts &amp; graphs</li> </ul>	<ul style="list-style-type: none"> <li>• drawing a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. (Fall, Winter, Spring, Summer).</li> <li>• solving simple addition, subtraction, and comparing word problems using information presented in a bar graph and a picture graph.</li> <li>• collecting measurement data by measuring lengths of several objects to the nearest whole unit and showing the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.</li> </ul>
<b>Geometry</b>	<ul style="list-style-type: none"> <li>• 2D and 3D shapes</li> <li>• Equal shares of a whole</li> <li>• Fraction</li> <li>• Halves</li> <li>• Thirds</li> <li>• Fourths</li> <li>• Quarters</li> <li>• Attributes</li> </ul>	<ul style="list-style-type: none"> <li>• Two-and-three dimensional objects have unique attributes.</li> <li>• A shape can be divided into equal parts.</li> </ul>	<ul style="list-style-type: none"> <li>• recognizing the specified attributes of shapes, such as a given number of angles or a given number of equal faces.</li> <li>• drawing shapes with specified attributes, such as a given number of angles or a given number of equal faces.</li> <li>• identifying triangles, quadrilaterals, pentagons, hexagons, cubes, pyramids, cones, and cylinders.</li> <li>• dividing a rectangle into rows and columns of same-size squares.</li> <li>• counting the same-size squares within the rows and columns to find the total number of squares.</li> <li>• dividing circles and rectangles into two, three or four equal shares and describing the equal shares as halves, thirds, fourths respectively.</li> <li>• describing the whole as two halves, three thirds, four fourths, etc.</li> <li>• recognizing that equal shares of identical wholes need not have the same shape.</li> </ul>

<p><b>Measurement</b></p>	<ul style="list-style-type: none"> <li>● Rulers, yard and meter sticks, tape measures</li> <li>● Number lines</li> <li>● Units of measure: inches, feet, yards, centimeters and meters</li> <li>● Length</li> </ul>	<ul style="list-style-type: none"> <li>● Some attributes of objects are measurable and can be quantified using unit amounts.</li> <li>● Objects can be measured using multiple units of measurement.</li> </ul>	<ul style="list-style-type: none"> <li>● measuring the length of an object twice, using two different units of measure, and describing how the two measurements relate to the size of the unit chosen. estimating lengths using units of inches, feet, centimeters, and meters.</li> <li>● Estimating the length of an object using appropriate units for that object.</li> <li>● measuring to determine how much longer one object is than another.</li> <li>● expressing the differences in length in terms of a standard length unit.</li> <li>● using addition and subtraction within 100 to solve word problems involving lengths that are given in the same unit by using drawings and equations with a symbol for the unknown number to represent the problem.</li> <li>● representing whole numbers as lengths from 0 on a number line with equally spaced points corresponding to the numbers 0, 1, 2... and represent whole number sums and differences within 100 on a number line.</li> <li>● generating measurement data by measuring lengths of several objects to the nearest whole unit or by making repeated measurements of the same object.</li> </ul>
<p><b>Place Value</b></p>	<ul style="list-style-type: none"> <li>● Base 10 blocks</li> <li>● Hundreds charts</li> <li>● &lt;, &gt;, = symbols</li> <li>● 2, 3, 4 digit numbers</li> <li>● Greater than</li> <li>● Less than</li> <li>● Equal to</li> <li>● Value</li> </ul>	<ul style="list-style-type: none"> <li>● The value of a number can be determined by the place value of the number.</li> <li>● Place value can be used to compare and order numbers.</li> </ul>	<ul style="list-style-type: none"> <li>● Representing 3 digit numbers using models, words, and numbers.</li> <li>● Identifying and understanding the value of digits in the hundreds, tens, and ones places</li> <li>● Skip-counting by 5s, 10s and 100s to 1000.</li> <li>● Identifying the hundreds, tens and ones place in a 3 digit number</li> <li>● Comparing the value of two three-digit numbers</li> </ul>

# Windham School District Curriculum

## Mathematics - Grade 2

### Unit 1: Time & Money

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics. In this unit, students will be able to tell and write time to the nearest 5 minutes. Students will be able to show an amount using dollars and/or coins.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.2.MD 7. Tell and write time from analog and digital clocks to the nearest five minutes using a.m. and p.m.</li> <li>● CCSS.2.MD 8. Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using dollar and cent symbols appropriately. Example: If you have two dimes and three pennies, how many cents do you have?</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● tell and write time to the nearest 5 minutes.</li> <li>● show an amount using dollars and/or coins.</li> </ul>	
	<i>Meaning</i>	
	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● Time can be given in many forms including o the nearest 5 minutes.</li> <li>● When counting money, it is usually easier to start with the coin with the greater value.</li> <li>● The same account of money can be represented using different combinations of coins and bills.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● How would life be different if we couldn't measure time?</li> <li>● What would the world be like without money?</li> <li>● How can time affect the decisions we make?</li> </ul>
	<i>Acquisition</i>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● analog and digital clocks</li> <li>● time to the nearest five minutes</li> <li>● am. and pm.</li> <li>● names and value of quarters, nickels, pennies, dimes, dollar bills</li> <li>● dollar and cent symbols</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● telling time from analog and digital clock to the nearest five minutes, using a.m. and p.m.</li> <li>● writing time from analog and digital clock to the nearest five minutes, using a.m. and p.m.</li> <li>● Determining the total amount of a collection of various coins (half dollars, quarters, dimes, nickels, pennies).</li> <li>● showing an amount several different ways using quarters, dimes, nickels and pennies.</li> <li>● solving word problems involving dollar bills and coins.</li> </ul>	
<i>Used in Content Area Standards</i>		<i>21<sup>st</sup> Century Skills</i>

<i>not applicable</i>	<ul style="list-style-type: none"> <li>● Problem Solving</li> <li>● Communication</li> <li>● Perseverance</li> </ul>
-----------------------	--

### Stage 2 - Evidence

<i>Evaluative Criteria</i>	<i>Assessment Evidence</i>
	ASSESSMENT: Written Assessments or Projects
	Other Evidence: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 2

### Unit 2: Addition & Subtraction Within 20

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics. In this unit, students will use addition and subtraction strategies to solve problems in everyday life.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>2.OA.A.1. Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing with unknowns in all positions; e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.</li> <li>2.OA.B.2. Fluently add and subtract within 20 using mental strategies. By the end of Grade 2, know from memory all sums of two one-digit numbers.</li> <li>2.OA.C.3 Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.</li> <li>2.OA.C.4 Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>use addition and subtraction strategies to solve problems in everyday life.</li> </ul>	
	<i>Meaning</i>	
	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>There are strategies for learning addition and subtraction facts within 20 that will help with fluency. This includes counting on, making ten, and decomposing.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>How would life be different if we couldn't add or subtract?</li> <li>Why is being able to add and subtract important?</li> <li>What would happen if you could only add, and not subtract?</li> </ul>
<i>Acquisition</i>		
	<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>how to identify the sum and difference in addition and subtraction equations.</li> <li>fact families are a group of four facts using the same three numbers.</li> <li>whether a number is odd or even</li> <li>how to arrange objects into arrays and write equations that represent the array</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>Solving one- and two- step problems using addition and subtraction within 20 with unknowns in all positions.</li> <li>demonstrating fluency of addition and subtraction facts within 20., using mental math strategies.</li> <li>writing fact families that consist of 2 addition and 2 subtraction equations using 3 numerals.</li> <li>arranging objects in rectangular arrays with up to 5 rows and 5 columns and writing an equation to express the total as a sum of equal addends.</li> </ul>

<i>Used in Content Area Standards</i>	<i>21<sup>st</sup> Century Skills</i>
<i>not applicable</i>	<ul style="list-style-type: none"> <li>● Problem solving</li> <li>● Communication</li> <li>● Perseverance</li> </ul>

<b>Stage 2 - Evidence</b>	
<i>Evaluative Criteria</i>	<i>Assessment Evidence</i>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 2

### Unit 3: Addition & Subtraction For Larger units

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics. In this unit, students will add and subtract within 100, and 1000 using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.2.NBT.B.5. Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.</li> <li>● CCSS.2.NBT.B.6. Add up to four two-digit numbers using strategies based on place value and properties of operations.</li> <li>● CCSS.2.NBT.B.7 Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● add and subtract within 100, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction</li> <li>● add and subtract 3-digit numbers using a variety of strategies such as the standard algorithm, mental math or partial sums.</li> </ul>	
	<i>Meaning</i>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Two digit numbers can be broken apart using tens and ones and added in different ways.</li> <li>● Three-digit numbers can be broken apart using hundreds, tens, and ones and added in different ways.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● How do we understand place value and use properties of operations to add and subtract?</li> <li>● How does the position of a digit in a number affect its value?</li> </ul>
<i>Acquisition</i>		
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● a variety of strategies to add and subtract.</li> <li>● how to compose and decompose 2 and 3-digit numbers to add and subtract.</li> <li>● place value</li> <li>● properties of operations of addition and subtraction</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● adding and subtracting numbers within 100 using place value strategies.</li> <li>● breaking apart numbers into tens and ones to find their sums and differences.</li> <li>● explaining their mathematical thinking.</li> <li>● adding up to four 2-digit numbers</li> <li>● understanding addends can be added in any order.</li> <li>● adding 10 or 100 mentally using place value</li> </ul>	

<ul style="list-style-type: none"> <li>● CCSS.2.NBT.B.8 Mentally add 10 or 100 to a given number 100-900 and mentally subtract 10 or 100 from a given number 100-900.</li> <li>● CCSS.2.NBT.B.9 Explain why addition and subtraction strategies work, using place value and the properties of operations.</li> </ul>		<ul style="list-style-type: none"> <li>● adding 3 digit numbers using a variety of strategies such as adding partial sums, compensation, traditional algorithms and mental math.</li> </ul>
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
<i>not applicable</i>		<ul style="list-style-type: none"> <li>● Problem Solving</li> <li>● Communication</li> <li>● Perseverance</li> </ul>

<b>Stage 2 - Evidence</b>	
<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	ASSESSMENT: Written Assessments or Projects
	Other Evidence: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 2

### Unit 4: Representing & Interpreting Data

Stage 1 Desired Results			
<p>ESTABLISHED GOALS: Students will continue their study of mathematics. In this unit, students will use data and graphs to make decisions and solve problems.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.2. MD 9. Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.</li> <li>● CCSS.2. MD 10. Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.</li> </ul>	<i>Transfer</i>		
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● use data and graphs to make decisions and solve problems.</li> </ul>		
	<i>Meaning</i>		
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● Some questions can be answered by collecting and analyzing data.</li> <li>● Data can be represented visually using charts and graphs.</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● Why is graphing important?</li> <li>● Is one graph better than another?</li> <li>● How do graphs help us learn about our world?</li> </ul> </td> </tr> </table>	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● Some questions can be answered by collecting and analyzing data.</li> <li>● Data can be represented visually using charts and graphs.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● Why is graphing important?</li> <li>● Is one graph better than another?</li> <li>● How do graphs help us learn about our world?</li> </ul>
	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● Some questions can be answered by collecting and analyzing data.</li> <li>● Data can be represented visually using charts and graphs.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● Why is graphing important?</li> <li>● Is one graph better than another?</li> <li>● How do graphs help us learn about our world?</li> </ul>	
<i>Acquisition</i>			
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● Data represents real world objects and ideas.</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● Drawing a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. (Fall, Winter, Spring, Summer).</li> <li>● Solving simple addition, subtraction, and comparing word problems using information presented in a bar graph and a picture graph.</li> <li>● Collecting measurement data by measuring lengths of several objects to the nearest whole unit and showing the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.</li> </ul> </td> </tr> </table>	<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● Data represents real world objects and ideas.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● Drawing a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. (Fall, Winter, Spring, Summer).</li> <li>● Solving simple addition, subtraction, and comparing word problems using information presented in a bar graph and a picture graph.</li> <li>● Collecting measurement data by measuring lengths of several objects to the nearest whole unit and showing the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.</li> </ul>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● Data represents real world objects and ideas.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● Drawing a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. (Fall, Winter, Spring, Summer).</li> <li>● Solving simple addition, subtraction, and comparing word problems using information presented in a bar graph and a picture graph.</li> <li>● Collecting measurement data by measuring lengths of several objects to the nearest whole unit and showing the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.</li> </ul>		
<i>Used in Content Area Standards</i>	<i>21<sup>st</sup> Century Skills</i>		
<i>not applicable</i>	<ul style="list-style-type: none"> <li>● Problem solving</li> <li>● Communication</li> <li>● Perseverance</li> </ul>		

**Stage 2 - Evidence**

<i>Evaluative Criteria</i>	<i>Assessment Evidence</i>
	ASSESSMENT: Written Assessments or Projects
	Other Evidence: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 2

### Unit 5: Geometry

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics. In this unit, students will be able to identify shapes in the world around them based on their attributes and also be able to divide wholes into equal shares.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.2.G.1. Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.</li> <li>● CCSS.2.G.2. Partition a rectangle into rows and columns of same-size squares and count to find the total number of them</li> <li>● CCSS.2.G.3. Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● identify shapes in the world around them based on their attributes .</li> <li>● divide wholes into equal shares.</li> </ul>	
	<i>Meaning</i>	
	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● Two-and-three-dimensional objects have unique attributes.</li> <li>● A shape can be divided into equal sized parts.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● How can geometry be used to solve problems?</li> <li>● How does understanding shapes help you to build?</li> <li>● How can you prove that something is divided equally?</li> </ul>
	<i>Acquisition</i>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● attributes of 2-D shapes (angles, sides, and vertices)</li> <li>● attributes of 3-D shapes (angles, vertices, faces)</li> <li>● 2-D shapes can be divided into equal shares (halves, thirds, fourths).</li> <li>● The names of shapes are based on their attributes</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● recognizing the specified attributes of shapes, such as a given number of angles or a given number of equal faces.</li> <li>● drawing shapes with specified attributes, such as a given number of angles or a given number of equal faces.</li> <li>● identifying triangles, quadrilaterals, pentagons, hexagons, cubes, pyramids, cones, and cylinders.</li> <li>● dividing a rectangle into rows and columns of same-size squares.</li> </ul>	

		<ul style="list-style-type: none"> <li>● counting the same-size squares within the rows and columns to find the total number of squares.</li> <li>● dividing circles and rectangles into two, three or four equal shares and describing the equal shares as halves, thirds, fourths respectively.</li> <li>● describing the whole as two halves, three thirds, four fourths, etc.</li> <li>● recognizing that equal shares of identical wholes need not have the same shape.</li> </ul>
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
<i>not applicable</i>		<ul style="list-style-type: none"> <li>● Problem Solving</li> <li>● Communication</li> <li>● Perseverance</li> </ul>

<b>Stage 2 - Evidence</b>	
<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	ASSESSMENT: Written Assessments or Projects
	Other Evidence: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 2

### Unit 6: Measurement

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics. In this unit, students will be able to use their understanding of measuring tools to measure objects.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.2.MD. 1 Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.</li> <li>● CCSS.2.MD. 2. Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.</li> <li>● CCSS.2.MD. 3 Estimate lengths using units of inches, feet, centimeters, and meters.</li> <li>● CCSS.2.MD. 4. Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard-length unit.</li> <li>● CCSS.2.MD.B5 Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● use their understanding of measuring tools to measure objects.</li> </ul>	
	<i>Meaning</i>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Some attributes of objects are measurable and can be quantified using unit amounts.</li> <li>● Objects can be measured using multiple units of measurements.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● What would life be like if standard units of measurement did not exist?</li> <li>● How does what we measure affect what we use to measure?</li> </ul>
	<i>Acquisition</i>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● Use the appropriate tool for measuring objects is important for accuracy.</li> <li>● Measurements can be compared.</li> <li>● similarity between a measuring tool and a number line.</li> <li>● how to use rulers, yardsticks, meter sticks, and measuring tapes to measure objects.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● measuring the length of an object twice, using two different units of measure, and describing how the two measurements relate to the size of the unit chosen. estimating lengths using units of inches, feet, centimeters, and meters.</li> <li>● Estimating the length of an object using appropriate units for that object.</li> <li>● measuring to determine how much longer one object is than another.</li> <li>● expressing the differences in length in terms of a standard length unit.</li> <li>● using addition and subtraction within 100 to solve word problems involving lengths that are given in the same unit by using drawings and</li> </ul>	

<p>symbol for the unknown number to represent the problem.</p> <ul style="list-style-type: none"> <li>● CCSS.2.MD.B6 Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, and represent whole-number sums and differences within 100 on a number line diagram.</li> </ul>		<p>equations with a symbol for the unknown number to represent the problem.</p> <ul style="list-style-type: none"> <li>● representing whole numbers as lengths from 0 on a number line with equally spaced points corresponding to the numbers 0, 1, 2... and represent whole number sums and differences within 100 on a number line.</li> <li>● generating measurement data by measuring lengths of several objects to the nearest whole unit or by making repeated measurements of the same object.</li> </ul>
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
<i>not applicable</i>		<ul style="list-style-type: none"> <li>● Problem solving</li> <li>● Communication</li> <li>● Perseverance</li> </ul>

### Stage 2 - Evidence

<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	ASSESSMENT: Written Assessments or Projects
	Other Evidence: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 2

### Unit 7: Place Value

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics. In this unit, students will understand the significance of ordering numbers in ones, tens, hundreds and thousands. Students will use place value to solve problems more efficiently.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● 2.NBT.A.1. Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:               <ul style="list-style-type: none"> <li>● - 100 can be thought of as a bundle of ten tens – called a “hundred”.</li> <li>● - The numbers 100, 200, 300, 400, 500, 600 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).</li> </ul> </li> <li>● 2.NBT.A.2. Count within 1000; skip-count by 5s, 10s, and 100s.</li> <li>● 2.NBT.A.3. Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.</li> <li>● 2.NBT.A.4. Compare two three-digit numbers based on meanings of the hundreds, tens, and</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● understand the significance of ordering numbers in ones, tens, hundreds and thousands.</li> <li>● use place value to solve problems more efficiently.</li> </ul>	
	<i>Meaning</i>	
	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● The value of a number can be determined by the place value of the number.</li> <li>● Place value can be used to compare and order numbers.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● How does the value of a digit change when it is moved from one place value to another?</li> <li>● Why is the number zero important in place value?</li> </ul>
	<i>Acquisition</i>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● value of a digit based on its position in a multi-digit number</li> <li>● Numbers can be represented using number names, base ten blocks, expanded form and numerals.</li> <li>● Numbers can be compared using symbols</li> <li>● The number 100 can be thought of as a bundle of ten 10s.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● Representing 3 digit numbers using models, words, and numbers.</li> <li>● Identifying and understanding the value of digits in the hundreds, tens, and ones places</li> <li>● Skip-counting to 1000 by 5s, 10s and 100s.</li> <li>● Identify the hundreds, tens and ones place in a 3 digit number.</li> <li>● Writing a 3-digit number using expanded notation.</li> <li>● Comparing the value of two three-digit numbers.</li> </ul>	

<p>ones digits, using <math>&gt;</math>, <math>=</math>, and <math>&lt;</math> symbols to record the results of comparisons.</p> <ul style="list-style-type: none"> <li>● 2.NBT.B.7. Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens ones and ones; and sometimes it is necessary to compose or decompose tens and hundreds.</li> <li>● 2.NBT.B.8. Mentally add 10 or 100 to a given number 100 to 900, and mentally subtract 10 or 100 from a given number 100 to 900.</li> </ul>		
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
<i>not applicable</i>		<ul style="list-style-type: none"> <li>● Problem solving</li> <li>● Communication</li> <li>● Perseverance</li> </ul>

<b>Stage 2 - Evidence</b>	
<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	ASSESSMENT: Written Assessments or Projects
	Other Evidence: independent practice, classroom observations and discussions

Title of Curriculum: Grade 3 Mathematics

Unit Name	What (content, vocab)	Why (enduring understandings)	How (skills)
<b>Multiplication and Division</b>	<ul style="list-style-type: none"> <li>● Multiplication</li> <li>● Repeated addition</li> <li>● Relationship between multiplication and division</li> <li>● Equal groups</li> <li>● Array</li> <li>● Commutative Property</li> <li>● Associative Property</li> <li>● Distributive Property</li> <li>● Identity Property</li> <li>● Zero Property</li> <li>● Patterns</li> <li>● Factors</li> <li>● Products</li> <li>● Unknown</li> <li>● Equation</li> <li>● Operation</li> </ul>	<ul style="list-style-type: none"> <li>● There are many strategies for multiplication including repeated addition of equal groups, arrays and patterns for modeling..</li> <li>● Division can be represented by fair share or equal groups situations.</li> <li>● Unknowns can be used in all positions when solving problems.</li> <li>● Multiplication and division have an inverse relationship and can be used to solve problems and check answers.</li> </ul>	<ul style="list-style-type: none"> <li>● Use repeated addition of equal groups to multiply.</li> <li>● Use patterns to multiply with different factors.</li> <li>● Use strategies to multiply (e.g. manipulatives, pictures, other facts they know).</li> <li>● Apply properties of operations as strategies to multiply and divide (Commutative, Distributive and Associative Property).</li> <li>● Determine the unknown whole number in a multiplication or division equation</li> <li>● Show mastery of all multiplication facts 0 to 10 with accuracy and fluency</li> <li>● Use multiplication facts to solve division facts</li> <li>● Solve one and two-step word problems using all four operations</li> </ul>
<b>Multiplication &amp; Division Math Fact Fluency</b>	<ul style="list-style-type: none"> <li>● properties of multiplication: commutative, associative, and distributive.</li> <li>● relationship between multiplication and division.</li> <li>● multiplication is repeated addition.</li> <li>● multiplication is the number of objects in a number of equal groups.</li> </ul>	<ul style="list-style-type: none"> <li>● Automaticity of multiplication facts 0-10 is beneficial when learning other computations in mathematics.</li> </ul>	<ul style="list-style-type: none"> <li>● Use multiplication facts to solve division facts.</li> <li>● Show a mastery of all multiplication facts 0 to 10 with accuracy and fluency</li> </ul>
<b>Place Value</b>	<ul style="list-style-type: none"> <li>● Ones, tens, hundreds, thousands</li> <li>● Round</li> <li>● Estimate</li> <li>● Multiples</li> </ul>	<ul style="list-style-type: none"> <li>● Understanding place value is an important strategy for developing proficiency in addition and subtraction.</li> </ul>	<ul style="list-style-type: none"> <li>● Round numbers to nearest ten or hundred.</li> <li>● Use rounding in estimating sums and differences.</li> </ul>

			<ul style="list-style-type: none"> <li>● Use rounding and estimating to assess the reasonableness of an answer. Use place value to multiply one-digit numbers by multiples of 10 in the range of 10 to 90</li> </ul>
<b>Fractions</b>	<ul style="list-style-type: none"> <li>● Numerator and denominator</li> <li>● Equal parts</li> <li>● Unit Fraction</li> <li>● Fraction tiles/ fraction strips</li> <li>● Number lines</li> <li>● Equivalent fractions</li> <li>● Same numerator</li> <li>● Same denominator</li> <li>● Whole numbers</li> <li>● half inch</li> <li>● Quarter inch</li> <li>● Line plot</li> <li>●</li> </ul>	<ul style="list-style-type: none"> <li>● A fraction describes the division of a whole into equal parts. The denominator tells how many equal parts the whole is divided into. The numerator tells how many equal parts are indicated.</li> </ul>	<ul style="list-style-type: none"> <li>● Write or draw a fraction to represent a drawing or place on a number line</li> <li>● Partition a shape into parts with equal areas and label those areas with fractions</li> <li>● Draw a number line from 0 to 1, partition it into equal parts and label each part with a fraction.</li> <li>● Compare fractions that have the same numerator or fractions that have the same denominator and use <math>&lt;</math>, <math>&gt;</math>, or <math>=</math> by reasoning about their size and using a visual model</li> <li>● Generate simple equivalent fractions using a line plot or visual fraction model.</li> <li>● Express same numerator and denominator as one whole</li> <li>● Represent a unit fraction on a number line</li> <li>● Recognize fractions as parts to the whole with an understanding of the numerator and denominator parts.</li> <li>● Students will understand how to use a ruler to measure lengths to the nearest half and quarter inch.</li> </ul>
<b>Measurement and Data: Time</b>	<ul style="list-style-type: none"> <li>● Minute hand</li> <li>● Hour hand</li> <li>● AM and PM</li> <li>● 5 minute intervals</li> <li>● Half past</li> <li>● Quarter past</li> <li>● Quarter of</li> <li>● 1 minute intervals</li> </ul>	<ul style="list-style-type: none"> <li>● Time can be measured using different units that are related to one another.</li> <li>● The minute hand takes 5 minutes to move from one number to the next on a typical clock.</li> </ul>	<ul style="list-style-type: none"> <li>● Tell time to the nearest minute.</li> <li>● Solve problems using addition and subtraction of time intervals in minutes on a number line</li> </ul>

	<ul style="list-style-type: none"> <li>Elapsed time (shown on number line, clock, or paper)</li> </ul>		
<b>Measurement and Data: Area and Perimeter</b>	<ul style="list-style-type: none"> <li>Area</li> <li>Unit square</li> <li>Perimeter</li> <li>Square units</li> <li>Units</li> <li>Length x Width</li> <li>Distributive Property</li> </ul>	<ul style="list-style-type: none"> <li>Perimeter and area are attributes of plane figures.</li> <li>Area is application of multiplication</li> <li>Perimeter is an application of addition</li> <li>There is a distinct difference between area and perimeter and how they are measured.</li> </ul>	<ul style="list-style-type: none"> <li>Measure area by counting squares</li> <li>Find area of a rectangle by using multiplication</li> <li>Solve problems involving area of rectangles and perimeters of polygons.</li> <li>Use area models to represent the Distributive Property.</li> <li>Add to find areas of shapes that consist of non-overlapping rectangles.</li> <li>Find the perimeter of a polygon.</li> <li>When given the perimeter of a polygon and some side lengths, find an unknown side length.</li> <li>Show that different rectangles can have the same perimeter as well as that different rectangles can have the same area.</li> </ul>
<b>Measurement and Data: Mass and Volume</b>	<ul style="list-style-type: none"> <li>Liquid volume/ capacity</li> <li>Mass</li> <li>Grams and kilograms</li> <li>Milliliters and liters</li> </ul>	<ul style="list-style-type: none"> <li>Capacity is a measure of the amount of liquid a container can hold.</li> <li>Mass is a measure of the quantity of matter in an object. Weight and mass are different.</li> </ul>	<ul style="list-style-type: none"> <li>Measure and estimate liquid volumes and masses of objects using standard units.</li> <li>Solve one-step word problems involving any operation using mass and volume given in the same units.</li> </ul>
<b>Geometry: Shapes and Attributes</b>	<ul style="list-style-type: none"> <li>Polygon (closed shapes)</li> <li>Attributes</li> <li>Side</li> <li>Angle, vertex</li> <li>Parallel sides</li> <li>Quadrilateral</li> <li>Rectangle, square, rhombus, parallelogram, trapezoid</li> <li>Category/ Categorize</li> </ul>	<ul style="list-style-type: none"> <li>There are many types of quadrilaterals including rhombuses, rectangles, and squares.</li> <li>Shapes are categorized based on attributes they share.</li> </ul>	<ul style="list-style-type: none"> <li>Identify types of quadrilaterals by their attributes (rhombuses, rectangles, and squares as examples of quadrilaterals.)</li> <li>Categorize shapes based on attributes they share.</li> </ul>

<b>Measurement and Data: Picture Graphs and Bar Graphs</b>	<ul style="list-style-type: none"> <li>● Bar graph</li> <li>● Picture Graph</li> <li>● Data</li> <li>● Scale</li> <li>● Key</li> <li>● Survey</li> <li>● Tally marks</li> </ul>	<ul style="list-style-type: none"> <li>● Some problems can be solved by making, reading, and analyzing a graph.</li> </ul>	<ul style="list-style-type: none"> <li>● Use bar graphs and picture graphs, to answer questions and solve problems.</li> <li>● Draw a bar graph or picture graph, with given data.</li> <li>● Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch.</li> </ul>
--	---	--	---

# Windham School District Curriculum

## Mathematics - Grade 3

### Unit 1: Multiplication & Division

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics. In this unit, students will represent and solve problems involving multiplication and division.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.MATH.CONTENT.3.OA.A.1: Interpret products of whole numbers, e.g., interpret <math>5 \times 7</math> as the total number of objects in 5 groups of 7 objects each.</li> <li>● CCSS.MATH.CONTENT.3.OA.A.2: Interpret whole-number quotients of whole numbers, e.g., interpret <math>56 \div 8</math> as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each.</li> <li>● CCSS.MATH.CONTENT.3.OA.A.3: Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.1</li> <li>● CCSS.MATH.CONTENT.3.OA.A.4: Determine the unknown whole number in a multiplication or division equation relating three whole numbers.</li> <li>● CCSS.MATH.CONTENT.3.OA.B.5: Apply properties of operations as strategies to multiply and divide.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● understand what multiplication is and how to represent it.</li> <li>● understand what division is and how to represent it.</li> <li>● solve multiplication and division facts using the strategies and properties.</li> </ul>	
	<i>Meaning</i>	
	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● There are many strategies for multiplication including repeated addition of equal groups, arrays and patterns for modeling..</li> <li>● Division can be represented by fair share or equal groups situations.</li> <li>● Unknowns can be used in all positions when solving problems.</li> <li>● Multiplication and division have an inverse relationship and can be used to solve problems and check answers.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● What are different meanings of multiplication?</li> <li>● What patterns can be found in multiplication?</li> <li>● What are different meanings of division?</li> <li>● How is division related to other operations?</li> </ul>
<i>Acquisition</i>		
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● properties of multiplication: commutative, associative, and distributive.</li> <li>● relationship between multiplication and division.</li> <li>● multiplication is repeated addition.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● Use repeated addition of equal groups to multiply.</li> <li>● Use patterns to multiply with different factors.</li> </ul>	

<ul style="list-style-type: none"> <li>● CCSS.MATH.CONTENT.3.OA.B.6: Understand division as an unknown-factor problem.</li> <li>● CCSS.MATH.CONTENT.3.OA.C.7: Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that <math>8 \times 5 = 40</math>, one knows <math>40 \div 5 = 8</math>) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.</li> <li>● CCSS.MATH.CONTENT.3.OA.D.8: Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.</li> <li>● CCSS.MATH.CONTENT.3.OA.D.9: Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations.</li> </ul>	<ul style="list-style-type: none"> <li>● multiplication is the number of objects in a number of equal groups.</li> </ul>	<ul style="list-style-type: none"> <li>● Use strategies to multiply (e.g. manipulatives, pictures, other facts they know).</li> <li>● Apply properties of operations as strategies to multiply and divide (Commutative, Distributive and Associative Property).</li> <li>● Determine the unknown whole number in a multiplication or division equation</li> <li>● Show mastery of all multiplication facts 0 to 10 with accuracy and fluency</li> <li>● Use multiplication facts to solve division facts</li> <li>● Solve one and two-step word problems using all four operations</li> </ul>
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
<i>not applicable</i>		<ul style="list-style-type: none"> <li>● Problem solving</li> <li>● Communication</li> <li>● Perseverance</li> </ul>

<b>Stage 2 - Evidence</b>	
<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	ASSESSMENT: Written Assessments or Projects
	Other Evidence: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 3

### Unit 2: Multiplication & Division Math Fact Fluency

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics. In this unit, students will fluently multiply and divide within 100.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>CCSS.MATH.CONTENT.3.OA.C.7: Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that <math>8 \times 5 = 40</math>, one knows <math>40 \div 5 = 8</math>) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>Master multiplication facts within 100</li> <li>Use multiplication to solve division facts</li> </ul>	
	<i>Meaning</i>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>Automaticity of multiplication facts 0-10 is beneficial when learning other computations in mathematics.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>Why do we need to know math facts?</li> </ul>
	<i>Acquisition</i>	
	<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>Multiplication facts 0 - 10</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>using multiplication facts to solve division facts.</li> <li>stating all multiplication facts 0 to 10 with accuracy and fluency</li> </ul>
<i>Used in Content Area Standards</i>		<i>21<sup>st</sup> Century Skills</i>
<i>not applicable</i>		<ul style="list-style-type: none"> <li>Perseverance</li> <li>Communication</li> </ul>

Stage 2 - Evidence	
<i>Evaluative Criteria</i>	<i>Assessment Evidence</i>
	ASSESSMENT: Written Assessments or Projects
	Other Evidence: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 3

### Unit 3: Place Value

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics. In this unit, students will use place value to add and subtract within 1,000. Students will round to the nearest 10 and 100 and use that to estimate sums and differences. Students will multiply single digit numbers by multiples of 10 in the range of 10 - 90.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.MATH.CONTENT.3.NBT.A.1: Use place value understanding to round whole numbers to the nearest 10 or 100.</li> <li>● CCSS.MATH.CONTENT.3.NBT.A.2: Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.</li> <li>● CCSS.MATH.CONTENT.3.NBT.A.3: Multiply one-digit whole numbers by multiples of 10 in the range 10-90 (e.g., <math>9 \times 80</math>, <math>5 \times 60</math>) using strategies based on place value and properties of operations.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● Multiply one-digit numbers by multiples of 10 in the range of 10 to 90</li> <li>● Estimate answers to check for accuracy and understanding.</li> </ul>	
	<i>Meaning</i>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Understanding place value is an important strategy for developing proficiency in addition and subtraction.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● Why is estimation useful?</li> <li>● How does place value affect estimation?</li> <li>● Why is estimation used in our everyday lives?</li> <li>● When is adding and subtraction two and three-digit numbers useful in our everyday lives?</li> </ul>
<i>Acquisition</i>		
	<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● rounding of two-digit and three-digit whole numbers .</li> <li>● regrouping for multi-digit arithmetic.</li> <li>● place value</li> </ul>	<p><i>Students will be skilled at....</i></p> <ul style="list-style-type: none"> <li>● multiplying one-digit whole numbers by multiples of 10 in the range 10 to 90.</li> <li>● rounding numbers to the nearest ten or hundred (up to 1,000)</li> <li>● rounding when estimating sums and differences.</li> <li>● estimating to assess the reasonableness of their answers.</li> <li>● regrouping when performing multi-digit arithmetic.</li> </ul>

		<ul style="list-style-type: none"> <li>● using place value to break large addition problems into smaller ones that are easier to add.</li> </ul>
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
<i>not applicable</i>		<ul style="list-style-type: none"> <li>● Problem Solving</li> <li>● Communication</li> <li>● Perseverance</li> </ul>

<b>Stage 2 - Evidence</b>	
<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 3

### Unit 4: Fractions

#### Stage 1 Desired Results

<p><b>ESTABLISHED GOALS:</b> Students will continue their study of mathematics. In this unit, students will recognize the relationship between parts and whole. Students will write and represent fractions using pictures, number lines and other visual tools. Students will be able to compare fractions of the same size whole.</p> <p><b>Content Standards:</b></p> <ul style="list-style-type: none"> <li>● CCSS.MATH.CONTENT.3.NF.A.1: Understand a fraction <math>1/b</math> as the quantity formed by 1 part when a whole is partitioned into <math>b</math> equal parts; understand a fraction <math>a/b</math> as the quantity formed by <math>a</math> part of size <math>1/b</math>.</li> <li>● CCSS.MATH.CONTENT.3.NF.A.2: Understand a fraction as a number on the number line; represent fractions on a number line diagram.</li> <li>● CCSS.MATH.CONTENT.3.NF.A.2.A: Represent a fraction <math>1/b</math> on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into <math>b</math> equal parts. Recognize that each part has size <math>1/b</math> and that the endpoint of the part based at 0 locates the number <math>1/b</math> on the number line.</li> <li>● CCSS.MATH.CONTENT.3.NF.A.2.B: Represent a fraction <math>a/b</math> on a number line diagram by marking off a length <math>1/b</math> from 0. Recognize that the resulting interval has size <math>a/b</math> and that its endpoint locates the number <math>a/b</math> on the number line.</li> <li>● CCSS.MATH.CONTENT.3.NF.A.3: Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.</li> </ul>	<b>Transfer</b>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● Explain how numbers are fractions</li> <li>● Expand their knowledge of a number line to include fractions</li> </ul>	
	<b>Meaning</b>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● A fraction describes the division of a whole into equal parts. The denominator tells how many equal parts the whole is divided into. The numerator tells how many equal parts are indicated.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● How is a fraction related to a whole?</li> </ul>
<b>Acquisition</b>		
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● a fraction is a quantity formed when a part of a whole is divided into equal parts.</li> <li>● a fraction is made up of equal parts.</li> <li>● equivalent fractions</li> <li>● Numerator and denominator</li> <li>● Equal parts</li> <li>● Unit Fraction</li> <li>● Fraction tiles/ fraction strips</li> <li>● Number lines</li> <li>● Equivalent fractions</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● writing a fraction to represent a drawing or place on a number line.</li> <li>● partitioning a shape into parts with equal areas and labeling those areas with fractions.</li> <li>● drawing a number line from 0 to 1, partitioning it into equal parts and labeling each part with a fraction.</li> <li>● drawing a number line with more than 1 whole, partitioning it into</li> </ul>	

<ul style="list-style-type: none"> <li>● CCSS.MATH.CONTENT.3.NF.A.3.A: Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.</li> <li>● CCSS.MATH.CONTENT.3.NF.A.3.B: Recognize and generate simple equivalent fractions, e.g., <math>1/2 = 2/4</math>, <math>4/6 = 2/3</math>. Explain why the fractions are equivalent, e.g., by using a visual fraction model.</li> <li>● CCSS.MATH.CONTENT.3.NF.A.3.C: Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. <i>Examples: Express 3 in the form <math>3 = 3/1</math>; recognize that <math>6/1 = 6</math>; locate <math>4/4</math> and 1 at the same point of a number line diagram.</i></li> <li>● CCSS.MATH.CONTENT.3.NF.A.3.D: Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols <math>&gt;</math>, <math>=</math>, or <math>&lt;</math>, and justify the conclusions, e.g., by using a visual fraction model.</li> <li>● CCSS.MATH.CONTENT.3.MD.B.4: Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.</li> </ul>	<ul style="list-style-type: none"> <li>● Same numerator</li> <li>● Same denominator</li> <li>● Whole numbers</li> <li>● half inch</li> <li>● Quarter inch</li> <li>● Line plot</li> </ul>	<p>equal parts and labeling each part with a fraction.</p> <ul style="list-style-type: none"> <li>● comparing two fractions that have the same numerator or two fractions that have the same denominator and use <math>&lt;</math>, <math>&gt;</math> or <math>=</math> by reasoning about their size and using a visual model.</li> <li>● recognizing and generating simple equivalent fractions and explaining why they are equivalent.</li> <li>● expressing whole numbers as fractions.</li> <li>● recognizing fractions as parts to the whole with an understanding of the numerator and denominator parts.</li> <li>● measuring lengths using rulers marked with halves and fourths of an inch.</li> </ul>
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
<i>not applicable</i>		<ul style="list-style-type: none"> <li>● Problem solving</li> <li>● Communication</li> <li>● Perseverance</li> </ul>

<b>Stage 2 - Evidence</b>	
<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 3

### Unit 5: Time

Stage 1 Desired Results			
<p>ESTABLISHED GOALS: Students will continue their study of mathematics. In this unit, students will tell and write time to the nearest minute. Students will solve problems involving time intervals.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.MATH.CONTENT.3.MD.A.1: Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.</li> </ul>	<i>Transfer</i>		
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● Tell and write time in hours, half-hours, quarter hours, five-minutes, and minutes using analog and digital clocks.</li> </ul>		
	<i>Meaning</i>		
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● Time can be measured using different units that are related to one another.</li> <li>● The minute hand takes 5 minutes to move from one number to the next on a typical clock.</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● Why is a clock designed the way it is?</li> <li>● How is time measured?</li> <li>● How are problems related to time used in our everyday life?</li> </ul> </td> </tr> </table>	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● Time can be measured using different units that are related to one another.</li> <li>● The minute hand takes 5 minutes to move from one number to the next on a typical clock.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● Why is a clock designed the way it is?</li> <li>● How is time measured?</li> <li>● How are problems related to time used in our everyday life?</li> </ul>
	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● Time can be measured using different units that are related to one another.</li> <li>● The minute hand takes 5 minutes to move from one number to the next on a typical clock.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● Why is a clock designed the way it is?</li> <li>● How is time measured?</li> <li>● How are problems related to time used in our everyday life?</li> </ul>	
<i>Acquisition</i>			
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><i>Students will understand...</i></p> <p>Fractions of time.</p> <ul style="list-style-type: none"> <li>● Minute hand</li> <li>● Hour hand</li> <li>● AM and PM</li> <li>● 5 minute intervals</li> <li>● Half past</li> <li>● Quarter past</li> <li>● Quarter of</li> <li>● 1 minute intervals</li> </ul> <p>Elapsed time (shown on number line, clock, or paper)</p> </td> <td style="width: 50%; vertical-align: top;"> <p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● telling time to the nearest minute.</li> <li>● Solving problems using time.</li> </ul> </td> </tr> </table>	<p><i>Students will understand...</i></p> <p>Fractions of time.</p> <ul style="list-style-type: none"> <li>● Minute hand</li> <li>● Hour hand</li> <li>● AM and PM</li> <li>● 5 minute intervals</li> <li>● Half past</li> <li>● Quarter past</li> <li>● Quarter of</li> <li>● 1 minute intervals</li> </ul> <p>Elapsed time (shown on number line, clock, or paper)</p>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● telling time to the nearest minute.</li> <li>● Solving problems using time.</li> </ul>	
<p><i>Students will understand...</i></p> <p>Fractions of time.</p> <ul style="list-style-type: none"> <li>● Minute hand</li> <li>● Hour hand</li> <li>● AM and PM</li> <li>● 5 minute intervals</li> <li>● Half past</li> <li>● Quarter past</li> <li>● Quarter of</li> <li>● 1 minute intervals</li> </ul> <p>Elapsed time (shown on number line, clock, or paper)</p>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● telling time to the nearest minute.</li> <li>● Solving problems using time.</li> </ul>		
<b>Used in Content Area Standards</b>	<b>21<sup>st</sup> Century Skills</b>		
<i>not applicable</i>	<ul style="list-style-type: none"> <li>● Communication</li> <li>● Perseverance</li> </ul>		

**Stage 2 - Evidence**

<i>Evaluative Criteria</i>	<i>Assessment Evidence</i>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 3

### Unit 6: Area & Perimeter

#### Stage 1 Desired Results

<p>ESTABLISHED GOALS: Students will continue their study of mathematics. In this unit, students will find the area and perimeter of given shapes.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.MATH.CONTENT.3.MD.C.5: Recognize area as an attribute of plane figures and understand concepts of area measurement.</li> <li>● CCSS.MATH.CONTENT.3.MD.C.5.A: A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area.</li> <li>● CCSS.MATH.CONTENT.3.MD.C.5.B: A plane figure which can be covered without gaps or overlaps by <math>n</math> unit squares is said to have an area of <math>n</math> square units.</li> <li>● CCSS.MATH.CONTENT.3.MD.C.6: Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).</li> <li>● CCSS.MATH.CONTENT.3.MD.C.7: Relate area to the operations of multiplication and addition.</li> <li>● CCSS.MATH.CONTENT.3.MD.C.7.A: Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.</li> <li>● CCSS.MATH.CONTENT.3.MD.C.7.B: Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent</li> </ul>	<b>Transfer</b>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● explain the difference between perimeter and area</li> <li>● solve real world problems involving the area perimeter.</li> </ul>	
	<b>Meaning</b>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Perimeter and area are attributes of plane figures.</li> <li>● Area is application of multiplication</li> <li>● Perimeter is an application of addition</li> <li>● There is a distinct difference between area and perimeter and how they are measured.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● How do we use area and perimeter in our everyday lives?</li> </ul>
<b>Acquisition</b>		
<p><b>Students will understand...</b></p> <ul style="list-style-type: none"> <li>● a unit square as a square with a side length of 1 unit</li> <li>● area as a certain number of unit squares with no gaps or overlaps</li> <li>● Area</li> <li>● Unit square</li> <li>● Perimeter</li> <li>● Square units</li> <li>● Units</li> </ul>	<p><b>Students will be skilled at...</b></p> <ul style="list-style-type: none"> <li>● measuring the area by counting squares.</li> <li>● finding the area of a rectangle using multiplication.</li> <li>● solving real world problems involving the area of rectangles and perimeters of polygons.</li> <li>● using area models to represent the distributive property.</li> </ul>	

<p>whole-number products as rectangular areas in mathematical reasoning.</p> <ul style="list-style-type: none"> <li>● CCSS.MATH.CONTENT.3.MD.C.7.C: Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths <math>a</math> and <math>b + c</math> is the sum of <math>a \times b</math> and <math>a \times c</math>. Use area models to represent the distributive property in mathematical reasoning.</li> <li>● CCSS.MATH.CONTENT.3.MD.C.7.D: Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.</li> <li>● CCSS.MATH.CONTENT.3.MD.D.8: Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.</li> </ul>	<ul style="list-style-type: none"> <li>● Length x Width</li> <li>● Distributive Property</li> <li>● distributive property as an area model</li> <li>● perimeter as the outside distance around a polygon.</li> </ul>	<ul style="list-style-type: none"> <li>● using addition to find areas of shapes that consist of non-overlapping rectangles.</li> <li>● finding the perimeter of a polygon.</li> <li>● when given the perimeter of a polygon and some side lengths, finding an unknown side length.</li> <li>● showing that different rectangles can have the same perimeter</li> <li>● showing that different rectangles can have the same area</li> <li>● finding the perimeter of a polygon.</li> </ul>
<b>Used in Content Area Standards</b>	<b>21<sup>st</sup> Century Skills</b>	
<i>not applicable</i>	<ul style="list-style-type: none"> <li>● Communication</li> <li>● Perseverance</li> <li>● Problem solving</li> </ul>	

<b>Stage 2 - Evidence</b>	
<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 3

### Unit 7: Mass & Volume

Stage 1 Desired Results			
<p>ESTABLISHED GOALS: Students will continue their study of mathematics. In this unit, students will use standard units to read and write mass and volume measurements.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>CCSS.MATH.CONTENT.3.MD.A.2: Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).1 Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.</li> </ul>	<b>Transfer</b>		
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>use standard units of measurement of mass and volume to solve problems.</li> </ul>		
	<b>Meaning</b>		
	<table border="1" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>Capacity is a measure of the amount of liquid a container can hold.</li> <li>Mass is a measure of the quantity of matter in an object. Weight and mass are different.</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>Why is measurement important in our lives?</li> <li>How is measurement used and shared around the world?</li> </ul> </td> </tr> </table>	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>Capacity is a measure of the amount of liquid a container can hold.</li> <li>Mass is a measure of the quantity of matter in an object. Weight and mass are different.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>Why is measurement important in our lives?</li> <li>How is measurement used and shared around the world?</li> </ul>
	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>Capacity is a measure of the amount of liquid a container can hold.</li> <li>Mass is a measure of the quantity of matter in an object. Weight and mass are different.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>Why is measurement important in our lives?</li> <li>How is measurement used and shared around the world?</li> </ul>	
<b>Acquisition</b>			
<table border="1" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>mass, volume, and length.</li> <li>appropriate units to use when measuring mass and volume: grams, kilograms, liters</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>measuring liquid volumes and masses of objects using standard units of grams, kilograms and liters.</li> <li>estimating liquid volumes and masses of objects using standard units of grams, kilograms and liters.</li> <li>solving one-step word problems involving any operation using mass and volume given in the same units.</li> </ul> </td> </tr> </table>	<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>mass, volume, and length.</li> <li>appropriate units to use when measuring mass and volume: grams, kilograms, liters</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>measuring liquid volumes and masses of objects using standard units of grams, kilograms and liters.</li> <li>estimating liquid volumes and masses of objects using standard units of grams, kilograms and liters.</li> <li>solving one-step word problems involving any operation using mass and volume given in the same units.</li> </ul>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>mass, volume, and length.</li> <li>appropriate units to use when measuring mass and volume: grams, kilograms, liters</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>measuring liquid volumes and masses of objects using standard units of grams, kilograms and liters.</li> <li>estimating liquid volumes and masses of objects using standard units of grams, kilograms and liters.</li> <li>solving one-step word problems involving any operation using mass and volume given in the same units.</li> </ul>		
<b>Used in Content Area Standards</b>	<b>21<sup>st</sup> Century Skills</b>		
<i>not applicable</i>	<ul style="list-style-type: none"> <li>Communication</li> <li>Perseverance</li> <li>Problem solving</li> </ul>		

**Stage 2 - Evidence**

<i>Evaluative Criteria</i>	<i>Assessment Evidence</i>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 3

### Unit 8: Geometry Shapes & Attributes

#### Stage 1 Desired Results

<p>ESTABLISHED GOALS: Students will continue their study of mathematics. In this unit, students will be able to identify and classify quadrilaterals based on their attributes.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>CCSS.MATH.CONTENT.3.G.A.1: Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>distinguish quadrilaterals based on their attributes.</li> <li>Categorize shapes based on shared attributes.</li> </ul>	
	<i>Meaning</i>	
	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>There are many types of quadrilaterals including rhombuses, rectangles, and squares.</li> <li>Shapes are categorized based on attributes they share.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>How can two-dimensional shapes be described, analyzed and classified?</li> <li>Why is a square always a rectangle, but a rectangle isn't always a square?</li> <li>How does math define different shapes in our world?</li> </ul>
	<i>Acquisition</i>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>shapes and their attributes (i.e. angles, lines, sides).</li> <li>hierarchical way for defining shapes into larger categories (i.e. quadrilaterals) and subcategories (such as rectangles).</li> <li>Polygon (closed shapes)</li> <li>Attributes</li> <li>Side</li> <li>Angle, vertex</li> <li>Parallel sides</li> <li>Quadrilateral</li> <li>Rectangle, square, rhombus, parallelogram, trapezoid</li> <li>Category/ Categorize</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>recognizing rhombuses, rectangles and squares as examples of quadrilaterals.</li> <li>drawing quadrilaterals that do not belong to any special subcategories of quadrilaterals (such as rhombuses, rectangles and squares).</li> <li>categorizing shapes based on their properties and attributes they share..</li> </ul>	

<i>Used in Content Area Standards</i>	<i>21<sup>st</sup> Century Skills</i>
<i>not applicable</i>	<ul style="list-style-type: none"> <li>● Communication</li> <li>● Perseverance</li> <li>● Problem solving</li> </ul>

<b>Stage 2 - Evidence</b>	
<i>Evaluative Criteria</i>	<i>Assessment Evidence</i>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 3

### Unit 9: Measurement & Data - Picture Graphs & Bar Graphs

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics. In this unit, students will create graphs to show data. Students will analyze and interpret pictures and bar graphs.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.MATH.CONTENT.3.MD.B.3: Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● read and understand graphs and what they represent.</li> <li>● compare data using a graph setting.</li> </ul>	
	<i>Meaning</i>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Some problems can be solved by making, reading, and analyzing a graph.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● How can we use graphs to represent and show data?</li> <li>● How can understanding (interpreting) pictures and bar graphs help us to understand real world data?</li> </ul>
	<i>Acquisition</i>	
	<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● Bar graph</li> <li>● Picture Graph</li> <li>● Data</li> <li>● Scale</li> <li>● Key</li> <li>● Survey</li> <li>● Tally marks</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● Use bar graphs and picture graphs, to answer questions and solve problems.</li> <li>● Draw a bar graph or picture graph, with given data.</li> <li>● Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch.</li> </ul>
<i>Used in Content Area Standards</i>	<i>21<sup>st</sup> Century Skills</i>	
<i>not applicable</i>	<ul style="list-style-type: none"> <li>● Communication</li> <li>● Perseverance</li> <li>● Problem solving</li> <li>● Critical Thinking</li> </ul>	

**Stage 2 - Evidence**

<i>Evaluative Criteria</i>	<i>Assessment Evidence</i>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

Title of Curriculum: Grade 4 Mathematics

Unit Name	What (content, vocab)	Why (enduring understandings)	How (skills)
<b>Place Value</b>	<ul style="list-style-type: none"> <li>● Round</li> <li>● Compare</li> <li>● Periods (ones, thousands etc.)</li> <li>● Determine operation</li> <li>● Break down (steps)</li> <li>● Estimate to check</li> </ul>	<ul style="list-style-type: none"> <li>● Place value is based on groups of ten and helps to organize our number system.</li> <li>● Place value can be used to compare and order numbers.</li> </ul>	<ul style="list-style-type: none"> <li>● Regroup numbers to the next place value</li> <li>● Write a multi-digit whole number in expanded, standard, and word form</li> <li>● Round whole numbers to any place</li> <li>● Compare multi-digit whole numbers</li> <li>● Read multi-digit numbers</li> <li>● Order multi-digit numbers</li> <li>● Use multiple strategies to solve problems</li> <li>● Assess the reasonableness of answers</li> </ul>
<b>Multi-digit Addition and Subtraction</b>	<ul style="list-style-type: none"> <li>● Line up place value</li> <li>● Regroup</li> <li>● Determine operation</li> <li>● Break down (steps)</li> <li>● Estimate to check</li> </ul>	<ul style="list-style-type: none"> <li>● Place value, properties of operations, and the relationship between addition and subtraction can be used in fluently adding &amp; subtracting whole numbers</li> <li>● Operations with whole numbers can be used to solve word problems.</li> </ul>	<ul style="list-style-type: none"> <li>● lining up numbers before adding/subtracting</li> <li>● adding multi digit number with regrouping</li> <li>● using borrowing when subtracting</li> <li>● identifying whether a word problem requires addition or subtraction</li> </ul>
<b>Multi-digit Multiplication and Division</b>	<ul style="list-style-type: none"> <li>● Different algorithms</li> <li>● Inverse operations</li> <li>● Equations</li> <li>● Rectangular arrays</li> <li>● Area models</li> <li>● Determine operation</li> <li>● Break down (steps)</li> <li>● Estimate to check</li> </ul>	<ul style="list-style-type: none"> <li>● Multiplication and division have an inverse relationship. The inverse relationship between multiplication and division can be used to solve problems.</li> <li>● When dividing the remainder must be less than the divisor. The nature of the question</li> </ul>	<ul style="list-style-type: none"> <li>● Multiply a whole number (up to four digits) by a one-digit whole number</li> <li>● Multiply two two-digit numbers</li> <li>● Demonstrate that multiplication is the inverse of division</li> <li>● Show mastery of all division facts with accuracy and fluency</li> <li>● Find whole number quotients and remainders with up to four-digit dividends and one-digit divisors</li> <li>● Use multiple strategies to solve problems</li> </ul>

		<p>asked determines how to interpret and use the remainder.</p> <ul style="list-style-type: none"> <li>Each estimation technique gives a way to replace numbers with other numbers that are close and easy to compute with mentally.</li> </ul>	<ul style="list-style-type: none"> <li>Assess the reasonableness of answers</li> </ul>
<b>Factors and Multiples</b>	<ul style="list-style-type: none"> <li>factor and multiple</li> <li>prime and composite</li> <li>a whole number as a product of each of its factors.</li> <li>1 is neither prime nor composite.</li> </ul>	<ul style="list-style-type: none"> <li>Every counting number is divisible by 1 and itself.</li> <li>Some counting numbers are divisible by numbers beyond 1 and itself.</li> <li>The product of any nonzero number and any other nonzero number is divisible by each number and called a multiple of each number.</li> </ul>	<ul style="list-style-type: none"> <li>Find all factor pairs for a whole number in the range 1 to 100</li> <li>Recognize that a whole number is a multiple of each of its factors</li> <li>Determine whether a given whole number, in the range 0 to 100, is a multiple of a given one-digit number</li> <li>Determine whether a given whole number, in the range 0 to 100, is prime or composite.</li> <li>Use factors and multiples to solve problems including finding equivalent fractions.</li> <li>Use multiple strategies to solve problems</li> <li>Assess the reasonableness of answers</li> </ul>
<b>Algebra: Patterns</b>	<ul style="list-style-type: none"> <li>Predictable</li> <li>Numerical/Geometrical</li> <li>Rules</li> <li>Determine operation</li> <li></li> </ul>	<ul style="list-style-type: none"> <li>Relationships can be described and generalizations made for mathematical situations that have numbers or objects that repeat in predictable ways.</li> <li>Some patterns consist of shapes or numbers that are arranged in a unit that repeats.</li> </ul>	<ul style="list-style-type: none"> <li>extending a given pattern.</li> <li>writing a rule for a given pattern.</li> <li>identifying the features of a pattern.</li> <li>creating a pattern</li> <li>Naming a pattern's rule.</li> </ul>

		<ul style="list-style-type: none"> <li>• Some sequences have patterns that can be described using mathematical rules.</li> <li>• Some real-world quantities have a mathematical relationship; the value of one quantity can be found if you know the value of another quantity.</li> </ul>	
<b>Fractions and Decimals</b>	<ul style="list-style-type: none"> <li>• The same fractional amount can be represented by an infinite set of different but equivalent fractions.</li> <li>• Benchmark fractions such as <math>\frac{1}{2}</math> are useful when comparing two fractions to each other.</li> <li>• Fractions can be built from unit fractions by applying and extending understandings of operations on whole numbers.</li> <li>• There is an equivalence between fractions and decimals.</li> </ul>	<ul style="list-style-type: none"> <li>• The same fractional amount can be represented by an infinite set of different but equivalent fractions.</li> <li>• Benchmark fractions such as <math>\frac{1}{2}</math> are useful when comparing two fractions to each other.</li> <li>• Fractions can be built from unit fractions by applying and extending understandings of operations on whole numbers.</li> <li>• There is an equivalence between fractions and decimals.</li> </ul>	<ul style="list-style-type: none"> <li>• Add and subtract fractions and mixed number with like denominators</li> <li>• Subtract fractions from a whole</li> <li>• Use models and pictures to show fraction addition and subtraction</li> <li>• Solve word problems using multiplication of fractions</li> <li>• Use a visual model to represent fraction multiplication</li> <li>• Find equivalent fractions</li> <li>• Determine if two fractions are equivalent</li> <li>• Compare fractions with like and unlike denominators</li> <li>• Use visual models to compare fractions</li> <li>• Convert fractions to decimals</li> <li>• Convert decimals to fractions with simplification</li> <li>• Locate decimals on number line</li> <li>• Compare decimals to hundredths</li> <li>• Use <math>&gt;</math>, <math>&lt;</math>, <math>=</math> in comparison sentence</li> <li>• Use multiple strategies to solve problems</li> <li>• Assess the reasonableness of answers</li> <li>• Display measurement data with fractions in a line plot.</li> </ul>

			<ul style="list-style-type: none"> <li>● Solve fraction addition and subtraction using a line plot</li> </ul>
<b>Measurement &amp; Data: Conversion and Area/Perimeter</b>	<ul style="list-style-type: none"> <li>● Systems of measurement</li> <li>● Relative units</li> <li>● Measurement equivalence</li> <li>● Area and perimeter</li> <li>● Formulas for rectangles</li> <li>● Determine operation</li> <li>● Break down (steps)</li> <li>● Estimate to check</li> </ul>	<ul style="list-style-type: none"> <li>● Some attributes of objects are measurable and can be quantified using unit amounts.</li> <li>● Time can be expressed using different units that are related to each other.</li> <li>● Some problems can be solved by applying the formula for the perimeter of a rectangle or the formula for the area of a rectangle.</li> </ul>	<ul style="list-style-type: none"> <li>● finding area and perimeter using formulas.</li> <li>● applying area and perimeter in real world problems.</li> <li>● solving problems related to the addition and subtraction of time in minutes.</li> <li>● finding elapsed time.</li> <li>● using strategies such as a number line to solve problems relating to time intervals.</li> <li>● showing measurement data on a line plot and draw a horizontal scale using whole numbers, halves, and quarters.</li> </ul>
<b>Measurement &amp; Data: Lines and Angles</b>	<ul style="list-style-type: none"> <li>● Formed by two rays common endpoint</li> <li>● Fraction of a circle</li> <li>● Angle represents turn</li> <li>● Lines, line segments, and rays</li> <li>● Right, acute, and obtuse</li> <li>● Symmetry</li> <li>● Determine operation</li> <li>● Break down (steps)</li> <li>● Estimate to check</li> </ul>	<ul style="list-style-type: none"> <li>● Line segments and rays are sets of points that describe parts of lines, shapes and solids.</li> <li>● Angles are formed by two intersecting lines or by rays with a common endpoint and are classified by size.</li> </ul>	<ul style="list-style-type: none"> <li>● Measure angles with a protractor</li> <li>● Represent an angle measurement as a fraction of a circle (over 360)</li> <li>● Draw an angle with a given measurement</li> <li>● Find unknown angle using addition and subtraction</li> <li>● Identify points, lines, line segments, rays, perpendicular, and parallel lines.</li> <li>● Identify right, acute, and obtuse angles.</li> <li>● Identify right triangles</li> <li>● Classify two-dimensional figures based on parallel and perpendicular lines</li> <li>● Identify and draw lines of symmetry on two-dimensional figures</li> <li>● Use multiple strategies to solve problems</li> <li>● Assess the reasonableness of answers</li> </ul>

# Windham School District Curriculum

## Mathematics - Grade 4

### Unit 1: Place Value

Stage 1 Desired Results		
<p><b>ESTABLISHED GOALS:</b> Students will continue their study of mathematics. In this unit, students will use place value to read, write, compare and round whole numbers to a given place.</p> <p><b>Content Standards:</b></p> <ul style="list-style-type: none"> <li>● CCSS.MATH.CONTENT.4.NBT.A.1: Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. <i>For example, recognize that <math>700 \div 70 = 10</math> by applying concepts of place value and division.</i></li> <li>● CCSS.MATH.CONTENT.4.NBT.A.2: Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using <math>&gt;</math>, <math>=</math>, and <math>&lt;</math> symbols to record the results of comparisons.</li> <li>● CCSS.MATH.CONTENT.4.NBT.A.3: Use place value understanding to round multi-digit whole numbers to any place.</li> <li>● CCSS.MATH.CONTENT.4.OA.A.3: Solve multi-step word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which</li> </ul>	<b>Transfer</b>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● read multi digit numbers from 1,000-1,000,000.</li> <li>● compare two multi digit numbers from 1,000-1,000,000.</li> </ul>	
	<b>Meaning</b>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Place value is based on groups of ten and helps to organize our number system.</li> <li>● Place value can be used to compare and order numbers.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● How is our number system organized?</li> <li>● How does the position of a digit in a number affect its value?</li> <li>● In what ways can numbers be composed and decomposed?</li> <li>● When can rounding be useful and in what situations should we not round?</li> </ul>
<b>Acquisition</b>		
	<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● That a digit in one place represents ten times what it represents in the place to its right.</li> <li>● Base-ten numerals, number names, and expanded form.</li> <li>● Round</li> <li>● Compare</li> <li>● Periods (ones, thousands etc.)</li> <li>● Determine operation</li> <li>● Break down (steps)</li> <li>● Estimate to check</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● Regroup numbers to the next place value</li> <li>● Write a multi-digit whole number in expanded, standard, and word form</li> <li>● Round whole numbers to any place</li> <li>● Compare multi-digit whole numbers</li> <li>● Read multi-digit numbers</li> <li>● Order multi-digit numbers</li> <li>● Use multiple strategies to solve problems</li> <li>● Assess the reasonableness of answers</li> </ul>

<p>remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.</p> <ul style="list-style-type: none"> <li>• *Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.</li> </ul>		
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
<i>not applicable</i>		<ul style="list-style-type: none"> <li>• Problem solving</li> <li>• Communication</li> <li>• Perseverance</li> </ul>

<b>Stage 2 - Evidence</b>	
<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 4

### Unit 2: Multi-Digit Addition & Subtraction

<b>Stage 1 Desired Results</b>		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics. In this unit, students will fluently add and subtract multi-digit whole numbers.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.MATH.CONTENT.4.NBT.B.4: Fluently add and subtract multi-digit whole numbers using the standard algorithm.</li> <li>● CCSS.MATH.CONTENT.4.OA.A.3: Solve multi-step word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.*Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● Add and subtract multi-digit numbers from 1,000-1,000,000.</li> </ul>	
	<i>Meaning</i>	
	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● Place value, properties of operations, and the relationship between addition and subtraction can be used in fluently adding and subtracting whole numbers.</li> <li>● Operations with whole numbers can be used to solve word problems.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● Why is it important to be fluent in adding and subtracting multi-digit whole numbers?</li> </ul>
	<i>Acquisition</i>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● Placement of the digits (line up the digits) when adding/subtracting</li> <li>● That you add/subtract from right to left</li> <li>● borrowing for subtracting</li> <li>● regrouping for adding               <ul style="list-style-type: none"> <li>○ Line up place value</li> <li>○ Regroup</li> <li>○ Determine operation</li> <li>○ Break down (steps)</li> <li>○ Estimate to check</li> </ul> </li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● lining up numbers before adding/subtracting</li> <li>● adding multi digit number with regrouping</li> <li>● using borrowing when subtracting</li> <li>● identifying whether a word problem requires addition or subtraction</li> </ul>	
<i>Used in Content Area Standards</i>		<i>21<sup>st</sup> Century Skills</i>
		<ul style="list-style-type: none"> <li>● Problem solving</li> </ul>

<i>not applicable</i>	<ul style="list-style-type: none"> <li>● Communication</li> <li>● Perseverance</li> </ul>
-----------------------	---

**Stage 2 - Evidence**

<i>Evaluative Criteria</i>	<i>Assessment Evidence</i>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 4

### Unit 3: Multi-Digit Multiplication & Division

Stage 1 Desired Results		
<p><b>ESTABLISHED GOALS:</b> Students will continue their study of mathematics. In this unit, students will be able to multiply a whole number (up to four digits) by a one digit whole number as well as two two digit numbers.</p> <p><b>Content Standards:</b></p> <ul style="list-style-type: none"> <li>● CCSS.MATH.CONTENT.4.NBT.B.5: Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.</li> <li>● CCSS.MATH.CONTENT.4.NBT.B.6: Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.</li> <li>● CCSS.MATH.CONTENT.4.OA.A.3: Solve multi-step word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which</li> </ul>	<b>Transfer</b>	
	<p>Students will be able to independently use their learning to...</p> <ul style="list-style-type: none"> <li>● demonstrate the connection between multiplication and division.</li> <li>● multiply multi-digit numbers</li> <li>● divide 4 digit dividends by 1 digit divisors</li> </ul>	
	<b>Meaning</b>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Multiplication and division have an inverse relationship. The inverse relationship between multiplication and division can be used to solve problems.</li> <li>● When dividing the remainder must be less than the divisor. The nature of the question asked determines how to interpret and use the remainder.</li> <li>● Each estimation technique gives a way to replace numbers with other numbers that are close and easy to compute with mentally.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● How can we use a model to show how the standard algorithm works?</li> <li>● Why is place value important in all algorithms for multiplication?</li> <li>● What is the relationship between repeated addition and multiplication?</li> <li>● How are multiplication and division related?</li> <li>● What is the relationship between repeated subtraction and division?</li> </ul>
<b>Acquisition</b>		
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● distributive property</li> <li>● set up for a long division problem</li> <li>● connection between multiplying and dividing</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● multiplying with multiples of 10</li> <li>● estimating products</li> <li>● multiplying a whole number (up to four digits) by a one-digit whole number.</li> <li>● multiplying two two-digit numbers.</li> </ul>	

<p>remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.</p>		<ul style="list-style-type: none"> <li>● demonstrating that multiplication is the inverse of division.</li> <li>● showing mastery of all division facts 0-9 with accuracy and fluency.</li> <li>● finding whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division.</li> </ul>
<p><b><i>Used in Content Area Standards</i></b></p>		<p><b><i>21<sup>st</sup> Century Skills</i></b></p>
<p><b><i>not applicable</i></b></p>		<ul style="list-style-type: none"> <li>● Problem solving</li> <li>● Communication</li> <li>● Perseverance</li> </ul>

### Stage 2 - Evidence

<b><i>Evaluative Criteria</i></b>	<b><i>Assessment Evidence</i></b>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 4

### Unit 4: Factors & Multiples

Stage 1 Desired Results		
<p><b>ESTABLISHED GOALS:</b> Students will continue their study of mathematics. In this unit, students will identify factors and multiples as well as find prime and composite numbers.</p> <p><b>Content Standards:</b></p> <ul style="list-style-type: none"> <li>CCSS.MATH.CONTENT.4.OA.B.4: Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-100 is prime or composite.</li> <li>CCSS.MATH.CONTENT.4.OA.A.3: Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>Name factors and multiples of a given number.</li> <li>Identify prime and composite numbers.</li> </ul>	
	<i>Meaning</i>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>Every counting number is divisible by 1 and itself.</li> <li>Some counting numbers are divisible by numbers beyond 1 and itself.</li> <li>The product of any nonzero number and any other nonzero number is divisible by each number and called a multiple of each number.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>In what ways are factors and multiples connected and what is the difference between them?</li> </ul>
<i>Acquisition</i>		
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>factor and multiple</li> <li>prime and composite</li> <li>a whole number as a product of each of its factors.</li> <li>1 is neither prime nor composite.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>Finding all factor pairs for a whole number in the range 1 to 100</li> <li>Recognizing that a whole number is a multiple of each of its factors</li> <li>Determining whether a given whole number, in the range 0 to 100, is a multiple of a given one-digit number</li> <li>Determining whether a given whole number, in the range 0 to 100, is prime or composite.</li> <li>Using factors and multiples to solve problems</li> </ul>	

		including finding equivalent fractions. <ul style="list-style-type: none"> <li>● Using multiple strategies to solve problems</li> <li>● Assessing the reasonableness of answers</li> </ul>
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
<i>not applicable</i>		<ul style="list-style-type: none"> <li>● Communication</li> <li>● Perseverance</li> <li>● Critical Thinking</li> </ul>

<b>Stage 2 - Evidence</b>	
<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 4

### Unit 5: Algebra - Patterns

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics. In this unit, students will generate and analyze patterns.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.MATH.CONTENT.4.OA.C.5: Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself.</li> <li>● CCSS.MATH.CONTENT.4.OA.A.3: Solve multi-step word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● Use patterns found in a sequence to solve real-world problems.</li> </ul>	
	<i>Meaning</i>	
	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● Relationships can be described and generalizations made for mathematical situations that have numbers or objects that repeat in predictable ways.</li> <li>● Some patterns consist of shapes or numbers that are arranged in a unit that repeats.</li> <li>● Some sequences have patterns that can be described using mathematical rules.</li> <li>● Some real-world quantities have a mathematical relationship; the value of one quantity can be found if you know the value of another quantity.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● How do patterns help us to make predictions and solve problems?</li> <li>● How are geometric and numerical patterns similar and different from one another?</li> <li>● How can we identify features of a pattern?</li> <li>● How does understanding patterns help you understand relationships between numbers?</li> </ul>
	<i>Acquisition</i>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● patterns can be predictable.</li> <li>● difference between a numerical and geometric pattern.</li> <li>● pattern rules.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● extending a given pattern.</li> <li>● writing a rule for a given pattern.</li> <li>● identifying the features of a pattern.</li> <li>● creating a pattern</li> <li>● Naming a pattern's rule.</li> </ul>	
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
<i>not applicable</i>		<ul style="list-style-type: none"> <li>● Communication</li> <li>● Perseverance</li> </ul>

	<ul style="list-style-type: none"> <li>● Critical thinking</li> <li>● Problem solving</li> </ul>
--	--

<b>Stage 2 - Evidence</b>	
<i>Evaluative Criteria</i>	<i>Assessment Evidence</i>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 4

### Unit 6: Fractions/Decimals

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics. In this unit, students will be able to add, subtract, multiply fractions as well as order and find equivalent fractions. Students will also be able to compare decimals.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.MATH.CONTENT.4.NF.A.1: Explain why a fraction <math>a/b</math> is equivalent to a fraction <math>(n \times a)/(n \times b)</math> by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.</li> <li>● CCSS.MATH.CONTENT.4.NF.A.2: Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as <math>1/2</math>. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols <math>&gt;</math>, <math>=</math>, or <math>&lt;</math>, and justify the conclusions, e.g., by using a visual fraction model.</li> <li>● CCSS.MATH.CONTENT.4.NF.B.3.B: Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. <i>Examples:</i> <math>3/8 = 1/8 + 1/8 + 1/8</math>; <math>3/8 = 1/8 + 2/8</math>; <math>2 \frac{1}{8} = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8</math>.</li> <li>● CCSS.MATH.CONTENT.4.NF.B.3.C: Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● Add, subtract, and multiply fractions.</li> <li>● Order and find equivalent fractions comparing to a benchmark fraction.</li> <li>● Compare decimals.</li> </ul>	
	<i>Meaning</i>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● The same fractional amount can be represented by an infinite set of different but equivalent fractions.</li> <li>● Benchmark fractions such as <math>1/2</math> are useful when comparing two fractions to each other.</li> <li>● Fractions can be built from unit fractions by applying and extending understandings of operations on whole numbers.</li> <li>● There is an equivalence between fractions and decimals.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● In what situations would we need to involve fractions in a word problem?</li> <li>● Why don't we add or subtract the denominators when adding/subtracting fractions?</li> <li>● Why is it that when we multiply a fraction by a fraction we get a smaller result?</li> <li>● Why do we multiply or divide the numerator and denominator by the same number when finding equivalent fractions?</li> <li>● How can you use a model to show equivalent fractions?</li> <li>● Why do we need denominators of 10 and 100 when we turn fractions into decimals?</li> </ul>

<ul style="list-style-type: none"> <li>● CCSS.MATH.CONTENT.4.NF.B.3.D: Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.</li> </ul>		<ul style="list-style-type: none"> <li>● Why is a hundredth smaller than a tenth when a hundred is bigger than a ten?</li> <li>● How are decimals related to fractions?</li> </ul>
<b>Acquisition</b>		
<ul style="list-style-type: none"> <li>● CCSS.MATH.CONTENT.4.NF.C.5: Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100.2 <i>For example, express <math>3/10</math> as <math>30/100</math>, and add <math>3/10 + 4/100 = 34/100</math>.</i></li> <li>● CCSS.MATH.CONTENT.4.NF.C.6: Use decimal notation for fractions with denominators 10 or 100. <i>For example, rewrite <math>0.62</math> as <math>62/100</math>; describe a length as <math>0.62</math> meters; locate <math>0.62</math> on a number line diagram.</i></li> <li>● CCSS.MATH.CONTENT.4.NF.C.7: Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols <math>&gt;</math>, <math>=</math>, or <math>&lt;</math>, and justify the conclusions, e.g., by using a visual model.</li> <li>● CCSS.MATH.CONTENT.4.NF.B.4: Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.</li> <li>● CCSS.MATH.CONTENT.4.NF.B.4.A: Understand a fraction <math>a/b</math> as a multiple of <math>1/b</math>. For example, use a visual fraction model to represent <math>5/4</math> as the product <math>5 \times (1/4)</math>, recording the conclusion by the equation <math>5/4 = 5 \times (1/4)</math>.</li> <li>● CCSS.MATH.CONTENT.4.NF.B.4.B: Understand a multiple of <math>a/b</math> as a multiple of <math>1/b</math>, and use this understanding to multiply a fraction by a whole number. For example, use a visual fraction model to express <math>3 \times (2/5)</math> as <math>6 \times (1/5)</math>, recognizing this product as <math>6/5</math>. (In general, <math>n \times (a/b) = (n \times a)/b</math>.)</li> <li>● CCSS.MATH.CONTENT.4.NF.B.4.C: Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. For example, if each person at a party will eat <math>3/8</math> of a pound of roast beef, and there</li> </ul>	<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● addition and subtraction of fractions as joining and separating parts referring to the same whole.</li> <li>● fractions with the same denominator can be decomposed into a sum of fractions in more than one way.</li> <li>● fractions can be expressed as a multiple of a whole number and a fraction</li> <li>● when two fractions are equivalent.</li> <li>● benchmark fractions</li> <li>● numerators and denominators</li> <li>● place value system for decimals up to the thousandths place.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● adding and subtracting fractions and mixed numbers with like denominators.</li> <li>● solving word problems involving addition and subtraction of fractions with like denominators.</li> <li>● subtracting fractions from a whole.</li> <li>● showing fraction addition and subtraction using models and pictures.</li> <li>● solving word problems using multiplication of fractions.</li> <li>● using a visual model to represent fraction multiplication.</li> <li>● finding equivalent fractions.</li> <li>● determining if two fractions are equivalent.</li> <li>● comparing fractions with like and unlike denominators</li> <li>● using <math>&lt;</math>, <math>&gt;</math> and <math>=</math> when comparing fractions.</li> <li>● using visual models to compare fractions.</li> <li>● identifying the relationship of “10 times as much” and “<math>1/10</math> of” in multi-digit numbers within our place value system.</li> <li>● reading and writing decimals from 0.001 to 10,000,000 in standard, expanded, and word form.</li> </ul>

<p>will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?</p>		<ul style="list-style-type: none"> <li>● comparing decimals.</li> <li>● identifying the place value of any digit in numbers 0.001 to 10,000,000.</li> <li>● explaining the pattern in the number of zeroes and placement of the decimal point when a number is multiplied or divided by a power of 10.</li> <li>● rounding decimals to the nearest tenths, hundredths, and thousandths.</li> </ul>
<p><b><i>Used in Content Area Standards</i></b></p>		<p><b><i>21<sup>st</sup> Century Skills</i></b></p>
<p><b><i>not applicable</i></b></p>		<ul style="list-style-type: none"> <li>● Communication</li> <li>● Perseverance</li> <li>● Problem solving</li> <li>● Critical Thinking</li> </ul>

<p><b>Stage 2 - Evidence</b></p>	
<p><b><i>Evaluative Criteria</i></b></p>	<p><b><i>Assessment Evidence</i></b></p>
	<p>ASSESSMENT: Written Assessments or Projects</p>
	<p>OTHER EVIDENCE: independent practice, classroom observations and discussions</p>

# Windham School District Curriculum

## Mathematics - Grade 4

### Unit 7: Measurement & Data - Conversion & Area/Perimeter

Stage 1 Desired Results		
<p><b>ESTABLISHED GOALS:</b> Students will continue their study of mathematics. In this unit, students will find equivalence in units of measure as well as use measurement formulas to find area/perimeter.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>CCSS.MATH.CONTENT.4.MD.A.1: Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. <i>For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...</i></li> <li>CCSS.MATH.CONTENT.4.MD.A.2: Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>Understand when the different forms of measurement are applicable to use</li> <li>Find equivalence in units of measure</li> <li>Use different forms of measurement to solve real-world problems</li> </ul>	
	<i>Meaning</i>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>Some attributes of objects are measurable and can be quantified using unit amounts.</li> <li>Time can be expressed using different units that are related to each other.</li> <li>Some problems can be solved by applying the formula for the perimeter of a rectangle or the formula for the area of a rectangle.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>What is the importance of measuring?</li> <li>What is a system of measurement and why are there different systems?</li> <li>What is the purpose of having more than one unit of measurement within a system?</li> <li>What are some real-world situations where we would use area and perimeter?</li> <li>How are area and perimeter related?</li> </ul>
<i>Acquisition</i>		
	<p><i>Students will understand...</i></p> <p>Systems of measurement</p> <ul style="list-style-type: none"> <li>Relative units</li> <li>Measurement equivalence</li> <li>Area and perimeter</li> <li>Formulas for rectangles</li> <li>Determine operation</li> <li>Break down (steps)</li> <li>Estimate to check</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>finding area and perimeter using formulas.</li> <li>applying area and perimeter in real world problems.</li> <li>solving problems related to the addition and subtraction of time in minutes.</li> <li>finding elapsed time.</li> <li>using strategies such as a number line to solve problems relating to time intervals.</li> </ul>

<p>such as number line diagrams that feature a measurement scale.</p> <ul style="list-style-type: none"> <li>● CCSS.MATH.CONTENT.4.MD.A.3: Apply the area and perimeter formulas for rectangles in real world and mathematical problems. <i>For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.</i></li> <li>● CCSS.MATH.CONTENT.4.OA.A.3: Solve multi-step word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.</li> </ul>		<ul style="list-style-type: none"> <li>● showing measurement data on a line plot and drawing a horizontal scale using whole numbers, halves, and quarters.</li> </ul>
<b><i>Used in Content Area Standards</i></b>		<b><i>21<sup>st</sup> Century Skills</i></b>
<b><i>not applicable</i></b>		<ul style="list-style-type: none"> <li>● Communication</li> <li>● Perseverance</li> <li>● Problem solving</li> <li>● Critical Thinking</li> </ul>

<b>Stage 2 - Evidence</b>	
<b><i>Evaluative Criteria</i></b>	<b><i>Assessment Evidence</i></b>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 4

### Unit 8: Measurement & Data Lines & Angles

#### Stage 1 Desired Results

**ESTABLISHED GOALS:**

Students will continue their study of mathematics. In this unit, students will understand concepts of angles and angle measurement as well as understand and classify lines, angles, and shapes.

*Content Standards:*

- CCSS.MATH.CONTENT.4.MD.C.5: Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:
- CCSS.MATH.CONTENT.4.MD.C.5.A: An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through  $\frac{1}{360}$  of a circle is called a "one-degree angle," and can be used to measure angles.
- CCSS.MATH.CONTENT.4.MD.C.5.B: An angle that turns through  $n$  one-degree angles is said to have an angle measure of  $n$  degrees.
- CCSS.MATH.CONTENT.4.OA.A.3: Solve multi-step word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers

*Transfer*

**Students will be able to independently use their learning to...**

- Find angle measurements and use them in solving real-world problems
- Understand the connection between lines, angles, and circles.

*Meaning*

**ENDURING UNDERSTANDINGS**

- Line segments and rays are sets of points that describe parts of lines, shapes and solids.
- Angles are formed by two intersecting lines or by rays with a common endpoint and are classified by size.

**ESSENTIAL QUESTIONS**

- When measuring angles, why is it important to use the correct measuring tool?
- How do angles relate to circles and lines?
- What should be taken into consideration when solving an angle's measurement?
- How is symmetry present in our everyday life?
- What strategies can be used to verify symmetry, parallel lines, and perpendicular lines?

*Acquisition*

*Students will understand...*

- angle is formed when two rays share a common endpoint.
- angles as a fraction of a circle.
- angles as turns.
- lines, line segments, and rays.

*Students will be skilled at...*

- measuring angles with a protractor.
- representing an angle measurement as a fraction over 360.
- drawing an angle with a given measurement.

<p>using mental computation and estimation strategies including rounding.</p> <ul style="list-style-type: none"> <li>● CCSS.MATH.CONTENT.4.G.A.1: Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.</li> <li>● CCSS.MATH.CONTENT.4.G.A.2: Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.</li> <li>● CCSS.MATH.CONTENT.4.G.A.3: Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.</li> </ul>	<ul style="list-style-type: none"> <li>● Parallel and perpendicular lines</li> <li>● classification of angles as right, acute, and obtuse.</li> <li>● right triangles</li> <li>● line of symmetry means that a figure can be folded on a line into matching parts.</li> </ul>	<ul style="list-style-type: none"> <li>● solving problems related to angle addition and subtraction.</li> <li>● finding an unknown angle using addition, subtraction, or sums of parts.</li> <li>● identifying points, lines, line segments, rays, perpendicular, and parallel lines in two-dimensional figures.</li> <li>● identify right, acute, and obtuse angles in two-dimensional figures.</li> <li>● classifying two-dimensional figures based on parallel and perpendicular lines.</li> <li>● identifying and drawing lines of symmetry in two-dimensional figures.</li> </ul>
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
<i>not applicable</i>		<ul style="list-style-type: none"> <li>● Communication</li> <li>● Perseverance</li> <li>● Problem solving</li> <li>● Critical Thinking</li> </ul>

<b>Stage 2 - Evidence</b>	
<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

Title of Curriculum: 5th Grade Mathematics

Unit Name	What (content, vocab)	Why (enduring understandings)	How (skills)
<b>Unit 1: Numbers and Operations: Place Value of Decimals; Adding and Subtracting Decimals</b>	<ul style="list-style-type: none"> <li>● place value system</li> <li>● decimal places to thousandths</li> <li>● exponents</li> <li>● powers of 10</li> <li>● decimal point placement</li> </ul>	<ul style="list-style-type: none"> <li>● The Base Ten numeration system is a scheme for recording numbers using digits 0-9, groups of ten and place value.</li> <li>● Place value patterns lead to a deeper understanding of decimal place value and increases the skill of reading and writing decimals.</li> <li>● Place value can be used to compare and order whole numbers and decimals.</li> </ul>	<ul style="list-style-type: none"> <li>● Identify the relationship between digits of a number in reference “10 times as much” and “1/10 of”</li> <li>● Read and write decimals in standard, expanded and word form</li> <li>● Identify place value</li> <li>● Explain patterns in number of zeroes/placement of decimal when a number is multiplied or divided by a power 10</li> <li>● Round decimals</li> <li>● Compare and order decimals</li> <li>● Add and subtract decimals to hundredths</li> <li>● Explain and/or model answers</li> <li>● Recognize the connections between addition and subtraction of decimals</li> <li>● Check for reasonableness of answers using estimation</li> </ul>
<b>Unit 2: Numbers and Operations: Multiplying Multi-digit Whole Numbers and Decimals</b>	<ul style="list-style-type: none"> <li>● place value</li> <li>● regrouping</li> <li>● multi-digit whole numbers</li> <li>● array area model</li> <li>● partial products</li> <li>● product</li> <li>● decimal operations</li> <li>● decimal point placement</li> <li>● standard multiplication algorithm</li> </ul>	<ul style="list-style-type: none"> <li>● The standard multiplication algorithm involving decimals is an extension of the standard algorithm for multiplying whole numbers. Place value determines the placement of the decimal point in a product.</li> <li>● The product of two decimals less than one is less than either factor.</li> </ul>	<ul style="list-style-type: none"> <li>● Multiply multi-digit whole numbers fluently</li> <li>● Solve multi-digit multiplication problems</li> <li>● Explain answers using words, rectangular arrays, and/or area models</li> <li>● Multiply decimals to hundredths</li> <li>● Check for reasonableness of answers using estimation</li> <li>● Solve problems using multiplication of decimals</li> </ul>
<b>Unit 3: Numbers and Operations: Dividing Multi-digit Whole Numbers</b>	<ul style="list-style-type: none"> <li>● divisor</li> <li>● dividend</li> <li>● quotient</li> </ul>	<ul style="list-style-type: none"> <li>● Using models can help students understand the standard</li> </ul>	<ul style="list-style-type: none"> <li>● Divide multi-digit whole numbers</li> </ul>

<p><b>and Decimals</b></p>	<ul style="list-style-type: none"> <li>• decimal point placement</li> </ul>	<p>algorithm for dividing whole numbers.</p> <ul style="list-style-type: none"> <li>• Estimation techniques are beneficial when checking for reasonableness of answers.</li> <li>• Dividing by 2-digit divisors is just an extension of the steps for dividing with 1-digit divisors.</li> <li>• A number divided by a decimal can be represented as an equivalent calculation using place value to change the divisor to a whole number.</li> </ul>	<ul style="list-style-type: none"> <li>• Recognize the connection between multiplication and division of whole numbers</li> <li>• Explain answers using words, rectangular arrays, and/or area models</li> <li>• Check for reasonableness of answers using estimation</li> <li>• Solve problems using division including decimals</li> <li>• Divide decimals to hundredths</li> </ul>
<p><b>Unit 4: Numbers and Operations: Adding and Subtracting Fractions and Mixed Numbers</b></p>	<ul style="list-style-type: none"> <li>• fractions</li> <li>• fraction bar</li> <li>• common denominator</li> <li>• mixed number</li> <li>• improper fraction</li> <li>• equivalent fractions</li> <li>• simplest form</li> </ul>	<ul style="list-style-type: none"> <li>• The same fractional amount can be represented by an infinite set of different but equivalent fractions.</li> <li>• A fraction in simplest form is when 1 is the only common factor of the numerator and denominator.</li> <li>• A number line can be used to estimate fractions to the nearest half or whole fraction.</li> <li>• All whole numbers can be represented as fractions.</li> <li>• Fractional amounts greater than 1 can be represented using a whole number and a fraction.</li> </ul>	<ul style="list-style-type: none"> <li>• Add and subtract fractions with unlike denominators</li> <li>• Add and subtract mixed numbers</li> <li>• Determine equivalent fractions</li> <li>• Use estimation to check for reasonableness of answers</li> <li>• Solve real world word problems using addition and subtraction of fractions and mixed numbers</li> </ul>
<p><b>Unit 5: Numbers and Operations: Multiplying and Dividing Fractions and Mixed Numbers</b></p>	<ul style="list-style-type: none"> <li>• improper fraction</li> <li>• mixed number</li> <li>• equivalence</li> <li>• simplest form</li> <li>• area</li> </ul>	<ul style="list-style-type: none"> <li>• When you multiply two fractions that are both less than 1, the product is smaller than either fraction.</li> </ul>	<ul style="list-style-type: none"> <li>• Multiply fractions with whole numbers</li> <li>• Multiply mixed numbers</li> <li>• Solve word problems involving multiplying fractions and/or mixed numbers</li> </ul>

	<ul style="list-style-type: none"> <li>● inverse operations</li> <li>● multiplication/division relationship</li> <li>● reciprocal</li> </ul>	<ul style="list-style-type: none"> <li>● One way to find the product of mixed numbers is to change the calculation to an equivalent one involving improper fractions.</li> <li>● The inverse relationship between multiplication and division can be used to divide with fractions.</li> </ul>	<ul style="list-style-type: none"> <li>● Find the area of a rectangle with fractional side lengths</li> <li>● Compare the size of factors to the size of a product</li> <li>● Solve real life word problems involving the division of whole numbers that give quotients of fractions or mixed numbers</li> <li>● Divide unit fractions by whole numbers and whole numbers by unit fractions</li> <li>● Explain answers using words, models and the relationship between multiplication and division</li> </ul>
<b>Unit 6: Geometry and Data: Volume Concepts and Measurement Conversions</b>	<ul style="list-style-type: none"> <li>● volume</li> <li>● cubic units</li> <li>● formula</li> <li>● base</li> <li>● area</li> <li>● unit cubes</li> <li>● three-dimensional figure</li> <li>● right rectangular prism</li> <li>● solid figure</li> <li>● measurement system</li> <li>● conversions</li> <li>● metric</li> <li>● U.S. Customary</li> </ul>	<ul style="list-style-type: none"> <li>● Many everyday objects closely approximate standard geometric solids.</li> <li>● Volume is a measure of the amount of space inside a solid.</li> <li>● Relationships exist that enable you to convert between units of measurements by multiplying or dividing.</li> </ul>	<ul style="list-style-type: none"> <li>● Find the volume of a right rectangular prism by counting cubic units</li> <li>● Find the volume of a right rectangular prism using a formula</li> <li>● Create multiple solid figures given a common volume.</li> <li>● Solve real world problems related to volume</li> <li>● Find the volume of a solid figure formed by two right rectangular prisms</li> <li>● Convert within a measurement system</li> <li>● Solve multi-step, real world problems involving conversions within a measurement system</li> </ul>
<b>Unit 7: Algebraic Thinking: Numerical Expressions</b>	<ul style="list-style-type: none"> <li>● grouping symbols</li> <li>● parentheses, brackets, braces</li> <li>● order of operations</li> <li>● numerical expressions</li> </ul>	<ul style="list-style-type: none"> <li>● There is an agreed upon order for which operations in a numerical expression are performed.</li> <li>● Some mathematical phrases can be represented using mathematical expressions.</li> </ul>	<ul style="list-style-type: none"> <li>● Simplify expressions involving parentheses, brackets, braces using order of operations</li> <li>● Write simple expressions given verbal or word-form expressions</li> </ul>
<b>Unit 8: Geometry and Data: Coordinate Plane and</b>	<ul style="list-style-type: none"> <li>● coordinate plane</li> <li>● x-axis</li> </ul>	<ul style="list-style-type: none"> <li>● Relationships can be described and generalizations made for</li> </ul>	<ul style="list-style-type: none"> <li>● Plot ordered pairs on a coordinate plane</li> </ul>

<p><b>Classifying Two-Dimensional Figures &amp; Algebraic Thinking: Analyzing Patterns and Relationships</b></p>	<ul style="list-style-type: none"> <li>● y-axis</li> <li>● origin</li> <li>● coordinate</li> <li>● ordered pair</li> <li>● first quadrant</li> <li>● hierarchy</li> <li>● properties/attributes</li> <li>● categories/subcategories</li> <li>● two-dimensional figures</li> <li>● classifying/grouping</li> <li>● triangles by angles and by sides</li> <li>● classifying quadrilaterals</li> <li>● relationships between corresponding terms</li> </ul>	<p>mathematical situations that have numbers or objects that repeat in predictable ways.</p> <ul style="list-style-type: none"> <li>● The coordinate system is a scheme that uses two perpendicular lines intersecting at a 0 to name the location of points on a plane.</li> <li>● Mathematical relationships represented by rules can also be represented by a graph of the rule. Ordered pairs that satisfy the rule can be used to graph the data.</li> <li>● Two-dimensional figures can be classified in a hierarchy based on their properties.</li> </ul>	<ul style="list-style-type: none"> <li>● Name coordinate pairs on a coordinate plane</li> <li>● Represent real world problems involving the first quadrant of the coordinate plane</li> <li>● Explain the meaning of each coordinate in the context of the problem</li> <li>● Form and plot coordinate pairs based on numerical patterns</li> <li>● Locate and label the origin on a coordinate plane</li> <li>● Explain the differences between the terms: axis, coordinate and ordered pairs</li> <li>● Classify and group two-dimensional figures in a hierarchy based on properties</li> <li>● Give all names for a given figure</li> <li>● Name a common property of a group of figures</li> <li>● Generate patterns given rules</li> <li>● Identify relationships between corresponding terms</li> <li>● Form ordered pairs from corresponding terms in two patterns and graph them on a coordinate plane</li> </ul>
--	--	--	--

# Windham School District Curriculum

## Mathematics - Grade 5

### Unit 1: Numbers & Operations

### Place Value & Adding & Subtracting Decimals

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study in Mathematics in the area of Numbers and Operations. In this unit students will gain a deeper understanding about place value from millions to thousandths while mastering the relationship between the different place values. They will gain an understanding of how to add and subtract decimals to the hundredths place.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.5.NBT.2 Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole number exponents to denote powers of 10.</li> <li>● CCSS.5.NBT.1. Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.</li> <li>● CCSS.5.NBT.3. Read, write, and compare decimals to thousandths.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● use knowledge of place value to manipulate numbers using various operations to solve real-life word problems.</li> </ul>	
	<i>Meaning</i>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● The Base Ten numeration system is a scheme for recording numbers using digits 0-9, groups of ten and place value.</li> <li>● Place value patterns lead to a deeper understanding of decimal place value and increases the skill of reading and writing decimals.</li> <li>● Place value can be used to compare and order whole numbers and decimals.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● How can you describe the relationship between any two place-value positions?</li> <li>● How can you use exponents to represent powers of 10?</li> <li>● How do you represent whole numbers and decimals?</li> <li>● How can you use place value to round decimals to a given place value?</li> <li>● How can you use base-ten blocks to model decimal addition/subtraction?</li> </ul>
	<i>Acquisition</i>	
	<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● place value system</li> <li>● decimal places to thousandths</li> <li>● exponents</li> <li>● powers of 10</li> <li>● decimal point placement</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● identifying the relationship between digits of a number in reference “10 times as much” and “1/10 of”</li> <li>● reading and writing decimals in standard, expanded and word form</li> <li>● identifying place value</li> </ul>

<ul style="list-style-type: none"> <li>● CCSS.5.NBT.4 Use place value understanding to round decimals to any place.</li> <li>● CCSS.5.NBT.7. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties, of operations, and/or the relationship between addition and subtractions; relate the strategy to a written method and explain the reasoning used.</li> <li>● CCSS.MP5 Use appropriate tools strategically.</li> <li>● CCSS.MP6 Attend to precision.</li> <li>● CCSS.MP1 Make sense of problems and persevere in solving them. CCSS.MP4 Model with mathematics.</li> <li>● CCSS.MP5 Use appropriate tools strategically.</li> <li>● CCSS.MP6 Attend to precision.</li> <li>● CCSS.MP8 Look for and express regularity in repeated reasoning.</li> </ul>		<ul style="list-style-type: none"> <li>● Explaining patterns in the number of zeros and the placement of a decimal point when a number is multiplied or divided by a power 10</li> <li>● rounding decimals</li> <li>● comparing and ordering decimals</li> <li>● Adding and subtracting decimals to hundredths</li> <li>● Explaining and/or modeling answers</li> <li>● Recognizing the connections between addition and subtraction of decimals</li> <li>● Checking for reasonableness of answers using estimation</li> </ul>
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
		<ul style="list-style-type: none"> <li>● Critical thinking</li> <li>● Communication</li> </ul>

<b>Stage 2 - Evidence</b>	
<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 5

### Unit 2: Numbers & Operations

### Multiplying Whole Numbers & Decimals

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study in Mathematics in the area of Numbers and Operations. In this unit students will master multi-digit multiplication of whole numbers and decimals.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.5.NBT.5. Fluently multiply whole numbers using the standard algorithm.</li> <li>● CCSS.5.NBT.7. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties, of operations, and/or the relationship between addition and subtractions; relate the strategy to a written method and explain the reasoning used.</li> <li>● CCSS.MP4 Model with mathematics.</li> <li>● CCSS.MP6 Attend to precision.</li> <li>● CCSS.MP1 Make sense of problems and persevere in solving them. CCSS.MP4 Model with mathematics.</li> <li>● CCSS.MP8 Look for and express regularity in repeated reasoning.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● use their knowledge of multiplying whole numbers to multiply decimals and apply it to solving word problems.</li> </ul>	
	<i>Meaning</i>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● The standard multiplication algorithm involving decimals is an extension of the standard algorithm for multiplying whole numbers. Place value determines the placement of the decimal point in a product.</li> <li>● The product of two decimals less than one is less than either factor.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● How can you use a basic fact or diagram (array area model) and a pattern to multiply a two digit number?</li> <li>● How can your understanding of partial products and place value inform your use of the standard algorithm?</li> <li>● How can powers of ten help you determine the digits' placement in relation to the decimal point?</li> <li>● How can you use models to multiply a decimal and whole number?</li> <li>● What is the connection between multiplying whole numbers and decimals?</li> </ul>
	<i>Acquisition</i>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● place value</li> <li>● regrouping</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● multiplying multi-digit whole numbers fluently</li> <li>● solving multi-digit multiplication problems</li> </ul>	

	<ul style="list-style-type: none"> <li>● multi-digit whole numbers</li> <li>● array area model</li> <li>● partial products</li> <li>● product</li> <li>● decimal operations</li> <li>● decimal point placement</li> <li>● standard multiplication algorithm</li> </ul>	<ul style="list-style-type: none"> <li>● explaining answers using words, rectangular arrays, and/or area models</li> <li>● multiplying decimals to hundredths</li> <li>● checking for reasonableness of answers using estimation</li> <li>● solving problems using multiplication of decimals</li> </ul>
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
		<ul style="list-style-type: none"> <li>● Critical thinking</li> <li>● Communication</li> </ul>

### Stage 2 - Evidence

<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 5

### Unit 3: Numbers & Operations

### Dividing Whole Numbers & Decimals

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study in Mathematics in the area of Numbers and Operations. In this unit students will master multi-digit division of whole numbers and will gain an understanding of how to divide decimals.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.5.NBT.6. Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculations by using equations, rectangular arrays, and/or area models.</li> <li>● CCSS.5.NBT.7. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties, of operations, and/or the relationship between addition and subtractions; relate the strategy to a written method and explain the reasoning used.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● use their understanding of dividing decimals to solve real-life word problems</li> <li>● gain a deeper understanding of estimation.</li> </ul>	
	<i>Meaning</i>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Using models can help students understand the standard algorithm for dividing whole numbers.</li> <li>● Estimation techniques are beneficial when checking for reasonableness of answers.</li> <li>● Dividing by 2-digit divisors is just an extension of the steps for dividing with 1-digit divisors.</li> <li>● A number divided by a decimal can be represented as an equivalent calculation using place value to change the divisor to a whole number.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● How is multiplication used to solve a division problem within the standard algorithm?</li> <li>● How can powers of ten help you determine the digits' placement in relation to the decimal point?</li> <li>● How can you use models to divide decimals?</li> </ul>
	<i>Acquisition</i>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● divisor</li> <li>● dividend</li> <li>● quotient</li> <li>● decimal point placement</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● dividing multi-digit whole numbers</li> <li>● recognizing the connection between multiplication and division of whole numbers</li> <li>● explaining answers using words, rectangular arrays, and/or area models</li> </ul>	

<ul style="list-style-type: none"> <li>● CCSS.MP1 Make sense of problems and persevere in solving them. CCSS.MP4 Model with mathematics.</li> <li>● CCSS.MP4 Model with mathematics.</li> <li>● CCSS.MP5 Use appropriate tools strategically.</li> <li>● CCSS.MP6 Attend to precision.</li> <li>● CCSS.MP8 Look for and express regularity in repeated reasoning.</li> </ul>		<ul style="list-style-type: none"> <li>● checking for reasonableness of answers using estimation</li> <li>● solving problems using division including decimals</li> <li>● dividing decimals to hundredths</li> </ul>
<b><i>Used in Content Area Standards</i></b>		<b><i>21<sup>st</sup> Century Skills</i></b>
		<ul style="list-style-type: none"> <li>● Critical thinking</li> <li>● Communication</li> </ul>

### Stage 2 - Evidence

<b><i>Evaluative Criteria</i></b>	<b><i>Assessment Evidence</i></b>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 5

### Unit 4: Numbers & Operations

#### Adding & Subtracting Fractions & Mixed Numbers

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study in Mathematics in the area of Number and Operations. In this unit students will gain an understanding of how to add and subtract fractions and mixed numbers with unlike denominators.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>CCSS.5.NF.1. Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. <i>For example, <math>\frac{2}{3} + \frac{5}{3} = \frac{15}{12} = \frac{23}{12}</math>. (In general, <math>\frac{a}{b} + \frac{c}{d} = \frac{ad + bc}{bd}</math>).</i></li> <li>CCSS.5.NF.2. Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. <i>For example,</i></li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>use adding and subtracting fractions to solve word problems</li> <li>Use their increased knowledge base in number and operations when learning algebraic skills.</li> </ul>	
	<i>Meaning</i>	
	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>The same fractional amount can be represented by an infinite set of different but equivalent fractions.</li> <li>A fraction in simplest form is when 1 is the only common factor of the numerator and denominator.</li> <li>A number line can be used to estimate fractions to the nearest half or whole fraction.</li> <li>All whole numbers can be represented as fractions.</li> <li>Fractional amounts greater than 1 can be represented using a whole number and a fraction</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>How can you use models to add and subtract fractions that have different denominators?</li> <li>How can you use your knowledge of factors to rewrite a pair of fractions so they have a common denominator?</li> <li>Can you explain why the denominators are not combined?</li> <li>How can you use regrouping to find the sums and differences of two mixed numbers?</li> </ul>
	<i>Acquisition</i>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>fractions</li> <li>fraction bar</li> <li>common denominator</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>Adding and subtracting fractions with unlike denominators</li> <li>Adding and subtracting mixed numbers</li> </ul>	

<p><i>recognize an incorrect result <math>2/5 + 1/2 = 3/7</math>, by observing that <math>3/7 &lt; 1/2</math>.</i></p> <ul style="list-style-type: none"> <li>● CCSS.MP4 Model with mathematics.</li> <li>● CCSS.MP5 Use appropriate tools strategically.</li> <li>● CCSS.MP6 Attend to precision.</li> <li>● CCSS.MP8 Look for and express regularity in repeated reasoning.</li> </ul>	<ul style="list-style-type: none"> <li>● mixed number</li> <li>● improper fraction</li> <li>● equivalent fractions</li> <li>● simplest form</li> </ul>	<ul style="list-style-type: none"> <li>● Determining equivalent fractions</li> <li>● Using estimation to check for reasonableness of answers</li> <li>● Solving real world word problems using addition and subtraction of fractions and mixed numbers</li> </ul>
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
		<ul style="list-style-type: none"> <li>● Critical thinking</li> <li>● Communication</li> <li>● Technology literacy</li> </ul>

### Stage 2 - Evidence

<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 5

### Unit 5: Numbers & Operations - Multiplying & Dividing Fractions

#### Stage 1 Desired Results

**ESTABLISHED GOALS:**

Students will continue their study in Mathematics in the area of Numbers and Operation. In this unit students will gain an understanding of how to multiply and fractions and mixed numbers. They will also gain an understanding of how to divide fractions using the reciprocal of a unit fraction.

*Content Standards:*

- CCSS.5.NF.4. Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.
- CCSS.5.NF.5. Interpret multiplication as scaling (resizing), by:
  - CCSS.MATH.CONTENT.5.NF.B.5.A: Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.
  - CCSS.MATH.CONTENT.5.NF.B.5.B: Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence  $a/b = (n \times a)/(n \times b)$  to the effect of multiplying  $a/b$  by 1.
- CCSS.5.NF.6. Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.
- CCSS.5.NF.3. Interpret a fraction as division of the numerator by the denominator ( $a/b = a \div b$ ). Solve word problems involving division of whole

*Transfer*

**Students will be able to independently use their learning to...**

- use their knowledge of multiplying fractions and mixed numbers to simplify expressions and solve equations
- make a connection between multiplying and dividing fractions
- Use their knowledge of number operations in real-life contexts

*Meaning*

**ENDURING UNDERSTANDINGS**

- When you multiply two fractions that are both less than 1, the product is smaller than either fraction.
- One way to find the product of mixed numbers is to change the calculation to an equivalent one involving improper fractions.
- The inverse relationship between multiplication and division can be used to divide with fractions.

**ESSENTIAL QUESTIONS**

- How can you use modeling to visualize the process of fraction multiplication?
- How can you use a model to show the fractional part of a quantity?

*Acquisition*

*Students will understand...*

- improper fraction
- mixed number
- equivalence
- simplest form
- area

*Students will be skilled at...*

- Multiplying using fractions and whole numbers as factors
- Multiplying using mixed numbers

<p>numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. <i>For example, interpret <math>\frac{3}{4}</math> as the result of dividing 3 by 4, noting that <math>\frac{3}{4}</math> multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size <math>\frac{3}{4}</math>. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?</i></p> <ul style="list-style-type: none"> <li>● CCSS.5.NF.7. Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.</li> <li>● CCSS.5.NF.B.7.C: Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. <i>For example, how much chocolate will each person get if 3 people share <math>\frac{1}{2}</math> lb. of chocolate equally? How many <math>\frac{1}{3}</math>-cup servings are in 2 cups of raisins?</i></li> <li>● CCSS.MP1 Make sense of problems and persevere in solving them.</li> <li>● CCSS.MP2 Reason abstractly and quantitatively.</li> <li>● CCSS.MP4 Model with mathematics.</li> <li>● CCSS.MP5 Use appropriate tools strategically.</li> <li>● CCSS.MP6 Attend to precision.</li> <li>● CCSS.MP8 Look for and express regularity in repeated reasoning.</li> </ul>	<ul style="list-style-type: none"> <li>● inverse operations</li> <li>● multiplication/division relationship</li> <li>● reciprocal</li> </ul>	<ul style="list-style-type: none"> <li>● Solving word problems involving multiplying fractions and/or mixed numbers</li> <li>● Finding the area of a rectangle with fractional side lengths</li> <li>● Comparing the size of factors to the size of a product</li> <li>● Solving real life word problems involving the division of whole numbers that give quotients of fractions or mixed numbers</li> <li>● Dividing unit fractions by whole numbers and whole numbers by unit fractions</li> <li>● Explaining answers using words, models and the relationship between multiplication and division</li> </ul>
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
		<ul style="list-style-type: none"> <li>● Critical thinking</li> <li>● Communication</li> </ul>

## Stage 2 - Evidence

<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 5

### Unit 6: Geometry & Data

#### Volume Concepts & Measurement Conversions

#### Stage 1 Desired Results

**ESTABLISHED GOALS:**

Students will continue their study in Mathematics in the area of Geometry and Data. In this unit students will gain an understanding of volume as an attribute of solid figures and how to compute the volume of right rectangular prisms. Students will also be able to convert measurements within the metric or U.S. Customary systems.

- *Content Standards:*  
CCSS.5.MD.1. Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05m), and use these conversions in solving multi-step, real world problems.
- CCSS.5.MD.3. Recognize volume as an attribute of solid figures and understand concepts of volume measurement.
- CCSS.5.MD.4. Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft., and improvised units.
- CCSS.5.MD.5. Relate volume to the operations of multiplication and addition and solve real world and CCSS.MP1 Make sense of problems and persevere in solving them.
- CCSS.MP3 Construct viable arguments and critique the reasoning of others.
- CCSS.MP6 Attend to precision.
- CCSS.MP7 Look for and make use of structure.

*Transfer*

**Students will be able to independently use their learning to...**

- use their conceptual understanding of volume to compare volumes of different solids
- apply their knowledge of measurement and conversions in science classes
- Apply their knowledge of geometry concepts in real life contexts

*Meaning*

**ENDURING UNDERSTANDINGS**

- Many everyday objects closely approximate standard geometric solids.
- Volume is a measure of the amount of space inside a solid.
- Relationships exist that enable you to convert between units of measurements by multiplying or dividing.

**ESSENTIAL QUESTIONS**

- What is a unit cube and how can you use it to build a solid figure?
- How can you use unit cubes to find the volume of a right rectangular prism and cube?
- How can you use multiplication to find the volume of a right rectangular prism?
- How does the area of the base of a prism relate to the volume of a right rectangular prism?
- How can you compare and convert metric units using base ten multiplication and division knowledge?
- How can you compare and convert customary units of length, capacity, and weight?

<ul style="list-style-type: none"> <li>CCSS.MP8 Look for and express regularity in repeated reasoning. mathematical problems involving volume.</li> </ul>	<b>Acquisition</b>	
	<i>Students will understand...</i> <ul style="list-style-type: none"> <li>volume</li> <li>cubic units</li> <li>formula</li> <li>base</li> <li>area</li> <li>unit cubes</li> <li>three-dimensional figure</li> <li>right rectangular prism</li> <li>solid figure</li> </ul>	<i>Students will be skilled at...</i> <ul style="list-style-type: none"> <li>Finding the volume of a right rectangular prism by counting cubic units</li> <li>Finding the volume of a right rectangular prism using a formula</li> <li>Creating multiple solid figures given a common volume.</li> <li>Solving real world problems related to volume</li> <li>Finding the volume of a solid figure formed by two right rectangular prisms</li> <li>Converting within a measurement system</li> <li>Solving multi-step, real world problems involving conversions within a measurement system</li> </ul>
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
		<ul style="list-style-type: none"> <li>Critical thinking</li> <li>Communication</li> <li>Technology literacy</li> </ul>

### Stage 2 - Evidence

<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 5

### Unit 7: Algebraic Thinking - Numerical Expressions

Stage 1 Desired Results			
<p>ESTABLISHED GOALS: Students will continue their study in Mathematics in the area of Algebraic Thinking. In this unit students will solve various expressions using order of operations.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.5.OA.1. Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.</li> <li>● CCSS.5.OA.2. Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. <i>For example, express the calculation “add 8 and 7, then multiply by 2” as <math>2 \times (8 + 7)</math>. Recognize that <math>3 \times (18932 + 921)</math> is three times as large as <math>18932 + 921</math>, without having to calculate the indicated sum or product.</i></li> <li>● CCSS.MP1 Make sense of problems and persevere in solving them.</li> <li>● CCSS.MP2 Reason abstractly and quantitatively</li> <li>● CCSS.MP6 Attend to precision.</li> <li>● CCSS.MP7 Look for and make use of structure.</li> <li>● CCSS.MP8 Look for and express regularity in repeated reasoning.</li> </ul>	<b>Transfer</b>		
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● apply order of operations to more complex algebraic expressions within algebra.</li> </ul>		
	<b>Meaning</b>		
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● There is an agreed upon order for which operations in a numerical expression are performed.</li> <li>● Some mathematical phrases can be represented using mathematical expressions.</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● Why are parentheses, brackets and braces important in numerical expressions?</li> <li>● How does the order of operations impact the answer?</li> </ul> </td> </tr> </table>	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● There is an agreed upon order for which operations in a numerical expression are performed.</li> <li>● Some mathematical phrases can be represented using mathematical expressions.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● Why are parentheses, brackets and braces important in numerical expressions?</li> <li>● How does the order of operations impact the answer?</li> </ul>
	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● There is an agreed upon order for which operations in a numerical expression are performed.</li> <li>● Some mathematical phrases can be represented using mathematical expressions.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● Why are parentheses, brackets and braces important in numerical expressions?</li> <li>● How does the order of operations impact the answer?</li> </ul>	
<b>Acquisition</b>			
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● grouping symbols</li> <li>● parentheses, brackets, braces</li> <li>● order of operations</li> <li>● numerical expressions</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● Simplifying expressions involving parentheses, brackets, braces using order of operations</li> <li>● Writing simple expressions given verbal or word-form expressions</li> </ul> </td> </tr> </table>	<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● grouping symbols</li> <li>● parentheses, brackets, braces</li> <li>● order of operations</li> <li>● numerical expressions</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● Simplifying expressions involving parentheses, brackets, braces using order of operations</li> <li>● Writing simple expressions given verbal or word-form expressions</li> </ul>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● grouping symbols</li> <li>● parentheses, brackets, braces</li> <li>● order of operations</li> <li>● numerical expressions</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● Simplifying expressions involving parentheses, brackets, braces using order of operations</li> <li>● Writing simple expressions given verbal or word-form expressions</li> </ul>		
<b>Used in Content Area Standards</b>	<b>21<sup>st</sup> Century Skills</b>		
	<ul style="list-style-type: none"> <li>● Critical thinking</li> <li>● Communication</li> </ul>		

## Stage 2 - Evidence

<i>Evaluative Criteria</i>	<i>Assessment Evidence</i>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 5

### Unit 8: Geometry & Data - Coordinate Plane, Classifying Two-Dimensional Figures, & Analyzing Patterns & Relationships

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study in Mathematics in the area of Geometry and Data. In this unit students will learn about the Coordinate Plane and be able to graph points and solve real-world problems by graphing points. Students will also be able to classify and identify characteristics of two dimensional figures. Lastly, students will analyze and identify different number patterns and apply them to real-life word problems.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>CCSS.5.G.1. Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plan located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>use their understanding of graphing ordered pairs to make connections to real life problems such as map locations.</li> <li>see how different figures exist in our world</li> <li>apply number patterns to the coordinate plane when creating lines on a graph.</li> </ul>	
	<i>Meaning</i>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>Relationships can be described and generalizations made for mathematical situations that have numbers or objects that repeat in predictable ways.</li> <li>The coordinate system is a scheme that uses two perpendicular lines intersecting at a 0 to name the location of points on a plane.</li> <li>Mathematical relationships represented by rules can also be represented by a graph of the rule. Ordered pairs that satisfy the rule can be used to graph the data.</li> <li>Two-dimensional figures can be classified in a hierarchy based on their properties.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>How can you identify and plot points on a coordinate grid?</li> <li>How can you use a coordinate grid to display data?</li> <li>How can you identify a relationship within the numerical patterns they generate?</li> <li>How can you classify and compare triangles and quadrilaterals?</li> <li>What types of relationships can occur between corresponding terms in two different numerical patterns?</li> </ul>
	<i>Acquisition</i>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>coordinate plane</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>Plotting ordered pairs on a coordinate plane</li> </ul>	

<ul style="list-style-type: none"> <li>● CCSS.5.G.2. Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.</li> <li>● CCSS.5.G.3. Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have 4 right angles and squares are rectangles, so all squares have 4 right angles.</li> <li>● CCSS.5.G.4. Classify two-dimensional figures in a hierarchy based on properties.</li> <li>● CCSS.5.OA.3. Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane.</li> <li>● CCSS.MP2 Reason abstractly and quantitatively</li> <li>● CCSS.MP3 Construct viable arguments and critique the reasoning of others.</li> <li>● CCSS.MP5 Use appropriate tools strategically.</li> <li>● CCSS.MP7 Look for and make use of structure.</li> </ul>	<ul style="list-style-type: none"> <li>● axis</li> <li>● x-axis</li> <li>● y-axis</li> <li>● origin</li> <li>● coordinate</li> <li>● ordered pair</li> <li>● first quadrant</li> <li>● hierarchy</li> <li>● properties/attributes</li> <li>● categories/subcategories</li> <li>● two-dimensional figures</li> <li>● classifying/grouping</li> <li>● triangles by angles and by sides</li> <li>● classifying quadrilaterals</li> <li>● relationships between corresponding terms</li> </ul>	<ul style="list-style-type: none"> <li>● Naming coordinate pairs on a coordinate plane</li> <li>● Representing real world problems involving the first quadrant of the coordinate plane</li> <li>● Explaining the meaning of each coordinate in the context of the problem</li> <li>● Forming and plotting coordinate pairs based on numerical patterns</li> <li>● Locating and labeling the origin on a coordinate plane</li> <li>● Explaining the differences between the terms: axis, coordinate and ordered pairs</li> <li>● Classifying and grouping two-dimensional figures in a hierarchy based on properties</li> <li>● Giving all names for a given figure</li> <li>● Naming a common property of a group of figures</li> <li>● Generating patterns given rules</li> <li>● Identifying relationships between corresponding terms</li> <li>● Forming ordered pairs from corresponding terms in two patterns and graph them on a coordinate plane</li> </ul>
<b><i>Used in Content Area Standards</i></b>		<b><i>21<sup>st</sup> Century Skills</i></b>
		<ul style="list-style-type: none"> <li>● Communication</li> <li>● Critical thinking</li> </ul>

## Stage 2 - Evidence

<b><i>Evaluative Criteria</i></b>	<b><i>Assessment Evidence</i></b>
	ASSESSMENT: Written Assessments or Projects
	Other Evidence: independent practice, classroom observations and discussions

Title of Curriculum: Grade 6 Mathematics

Unit Name	What (Content and Vocabulary)	Why? (Enduring Understanding)	How (skills)
<b>Unit 1: Number and Operations: Ratios and Proportional Relationships</b>	<ul style="list-style-type: none"> <li>● Ratios</li> <li>● Unit Rates</li> <li>● Proportions</li> <li>● Fraction, decimal, percent conversions</li> <li>● Terminating and repeating decimals</li> <li>● ratios as a fraction or percentage</li> <li>● equivalent ratios</li> <li>● a rate is a ratio involving units</li> <li>● 100% is all of the original amount</li> </ul>	<ul style="list-style-type: none"> <li>● A ratio or rate describes the relationship between two quantities.</li> <li>● Ratio reasoning can be applied to many different types of mathematical and real-life problems</li> <li>● A rate is a type of ratio that represents a measure or quantity. Therefore the process for solving ratio problems can be applied to rates.</li> </ul>	<ul style="list-style-type: none"> <li>● Simplify ratios</li> <li>● Compare ratios in different formats</li> <li>● Find equivalent ratios</li> <li>● Calculate unit rate</li> <li>● Find a missing number in a proportion</li> <li>● Interchange fractions, decimals and percents</li> <li>● Find percent of a quantity.</li> <li>● Solve percent real world problems</li> </ul>
<b>Unit 2: Number and Operations: Fractions and Decimals</b>	<ul style="list-style-type: none"> <li>● Factors</li> <li>● Multiples</li> <li>● Place Value</li> <li>● Reciprocal</li> <li>● Dividend</li> <li>● Divisor</li> <li>● Quotient</li> <li>● the value of a digit in relationship to its position in a number</li> </ul>	<ul style="list-style-type: none"> <li>● Multiplication and division are inverse operations.</li> <li>● Operations on decimals and whole numbers are based upon place value relationships.</li> <li>● Number lines are visual models used to represent the density principle: between any two whole numbers are many rational numbers, including decimals and fractions.</li> <li>● The magnitude of numbers affects the outcome of operations on them.</li> <li>● Computational fluency includes applying the most effective and efficient strategy when applicable.</li> </ul>	<ul style="list-style-type: none"> <li>● Divide fractions by fractions</li> <li>● Find common factors, greatest common factors, and multiples</li> <li>● Add, subtract, multiply and divide mixed numbers</li> <li>● Divide decimals</li> </ul>
<b>Unit 3: Numbers and Operations - Integers</b>	<ul style="list-style-type: none"> <li>● Integers</li> <li>● Rational Number</li> <li>● Absolute Value</li> </ul>	<ul style="list-style-type: none"> <li>● Positive and negative numbers are used together to describe quantities having opposite directions or values</li> </ul>	<ul style="list-style-type: none"> <li>● Create a number line with integers</li> </ul>

	<ul style="list-style-type: none"> <li>● Opposite</li> <li>● Number Line</li> <li>● Coordinate Plane</li> <li>● X Axis</li> <li>● Y Axis</li> <li>● Reflection</li> <li>● Horizontal</li> <li>● Vertical</li> <li>● absolute value as the distance away from zero on a number line</li> </ul>	<ul style="list-style-type: none"> <li>● All rational numbers can be represented as a point on the number line.</li> <li>● Students will understand that absolute value is the distance from zero on a number line.</li> <li>● The coordinate plane can be used to describe location in two dimensions, defined by an ordered pair.</li> </ul>	<ul style="list-style-type: none"> <li>● Understand the relationship between a positive or negative number and its opposite</li> <li>● Find missing values in a situation</li> <li>● Graph with positive and negative coordinates</li> </ul>
<b>Unit 4: Algebraic Thinking - expressions</b>	<ul style="list-style-type: none"> <li>● Algebraic expressions</li> <li>● Exponents</li> <li>● Constant</li> <li>● Coefficient</li> <li>● Term</li> <li>● Like Terms</li> <li>● Variable</li> <li>● Distributive Property</li> </ul>	<ul style="list-style-type: none"> <li>● Expressions are powerful tools for exploring, reasoning about, and representing situations.</li> <li>● Variables have many different meanings, depending on context and purpose.</li> <li>● Variables permit writing expressions whose values are unknown or vary under different circumstances.</li> <li>● Two or more expressions may be equivalent, even when their symbolic forms differ.</li> <li>● Linear expressions may be added to or subtracted from one another.</li> </ul>	<ul style="list-style-type: none"> <li>● Simplify algebraic expressions with whole numbers</li> <li>● Create algebraic expressions from verbal, written and interpretational expressions</li> <li>● Apply and extend previous understandings of arithmetic to algebraic expressions, including whole number exponents</li> </ul>
<b>Unit 5: Algebraic Thinking: Equations</b>	<ul style="list-style-type: none"> <li>● Equations</li> <li>● Inequalities</li> <li>● Greater than</li> <li>● Less than</li> <li>● Greater than or equal to</li> <li>● Less than or equal to</li> <li>● Dependant Variable</li> </ul>	<ul style="list-style-type: none"> <li>● Solving an equation is a process of answering a question by finding the value of the variable that makes the equation true.</li> <li>● An equation is two equivalent expressions.</li> <li>● Variables are used to represent two</li> </ul>	<ul style="list-style-type: none"> <li>● Write an equation to express one quantity, the dependent variable, in terms of the other quantity, the independent variable.</li> <li>● Write an equation from data tables and graphs</li> <li>● Define a variable and create an equation</li> </ul>

	<ul style="list-style-type: none"> <li>• Independent Variable</li> <li>• Constant</li> <li>• Coefficient</li> <li>• Substitution</li> <li>• Equivalent</li> </ul>	quantities in a real world problem that change in relationship to one another.	<p>and / or an inequality from a word problem</p> <ul style="list-style-type: none"> <li>• Solve one step equations and inequalities</li> </ul>
<b>Unit 6: Geometry and Data - Area and Surface Area</b>	<ul style="list-style-type: none"> <li>• Length</li> <li>• Width</li> <li>• Parallelogram</li> <li>• Altitude</li> <li>• Trapezoid</li> <li>• Area as space inside a figure</li> <li>• Area of a parallelogram <math>A = bh</math></li> <li>• Area of a triangle <math>A = \frac{1}{2} bh</math></li> <li>• Area of a trapezoid <math>A = \frac{1}{2} (b_1 + b_2)h</math></li> <li>• Units squared</li> <li>• Net</li> <li>• Surface Area</li> <li>• Area</li> <li>• Composite Figures</li> <li>• Kite</li> <li>• Compose</li> <li>• decompose</li> <li>• irregular shapes</li> <li>• Two-dimensional figures</li> <li>• three-dimensional figures</li> <li>• faces, edges, vertices.</li> <li>• Solid</li> <li>• prism</li> <li>• lateral surface area</li> <li>• area is the surface inside a flat, closed figure.</li> </ul>	<ul style="list-style-type: none"> <li>• The area of all 2-dimensional figures can be calculated by breaking irregular shapes into rectangles or triangles.</li> <li>• A three-dimensional figure can be represented by two-dimensional nets, which can help determine the surface area of three-dimensional figures.</li> </ul>	<ul style="list-style-type: none"> <li>• Draw a net for a given solid</li> <li>• Calculate area of the irregular shapes</li> <li>• Calculate area and surface area using models</li> <li>• Fluently calculate area and surface area using formulas</li> <li>• Calculate surface area of rectangular prisms</li> </ul>

	<ul style="list-style-type: none"> <li>irregular shapes are the combination of multiple figures.</li> <li>nets are three-dimensional figures drawn on a surface.</li> <li>surface area is the sum of the areas of all faces.</li> </ul>		
<b>Unit 7: Geometry and Data - Volume</b>	<ul style="list-style-type: none"> <li>Polygon</li> <li>Polyhedron</li> <li>Edge</li> <li>Vertex</li> <li>Length</li> <li>Width</li> <li>Depth</li> <li>Cubic Units</li> <li>Formula: <math>V=LWH</math> or <math>V=Bh</math></li> <li>Irregular Figures</li> <li>Prism</li> <li>volume as the space inside a solid.</li> </ul>	<ul style="list-style-type: none"> <li>Volume is the number of cubes that can fit inside of a solid.</li> <li>The generic formula for volume is the area of the base multiplied by the height.</li> </ul>	<ul style="list-style-type: none"> <li>Find volume by packing it with unit cubes of the appropriate unit fraction edge lengths (modeling)</li> <li>Identify faces, edges, and vertices</li> <li>Calculate volume using models</li> <li>Fluently calculate volume using formulas</li> <li>Solve real word problems involving volume</li> </ul>
<b>Unit 8: Geometry and Data - Statistics and Probability</b>	<ul style="list-style-type: none"> <li>Variability</li> <li>Data</li> <li>statistical questioning</li> <li>statistical process</li> <li>Sample</li> <li>bar graph</li> <li>Frequency</li> <li>Mode</li> <li>dot plot</li> <li>Distribution</li> <li>Symmetric</li> <li>Outliers</li> <li>Histogram</li> <li>Measure of center</li> <li>Median</li> </ul>	<ul style="list-style-type: none"> <li>A statistical question anticipates variability in the data related to the question and accounts for it in the answers.</li> <li>A set of data collected to answer a statistical question has a distribution, which can be described by its center, spread, and overall shape.</li> <li>A measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.</li> </ul>	<ul style="list-style-type: none"> <li>Create statistical questions</li> <li>Determine measures of central tendency</li> <li>Choose which measure of central tendency is appropriate for a given set of points</li> <li>Analyze data from a given dot plot, histogram, and box plots</li> <li>Report observations about data using mathematical vocabulary: giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation),</li> </ul>

	<ul style="list-style-type: none"><li>● balance point</li><li>● Mean</li><li>● measures of variation</li><li>● Range</li><li>● Quartile</li><li>● Interquartile range (IQR)</li><li>● Box-and-whisker plot</li><li>● Deviation</li><li>● Absolute Deviation</li><li>● Mean Absolute Deviation</li><li>● misleading data</li><li>● statistical variability</li></ul>		
--	---	--	--

# Windham School District Curriculum

## Mathematics - Grade 6

### Unit 1: Numbers & Operations

### Ratios & Proportional Relationships

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the area of numbers and operations. In this unit, students will explore the concepts and ratios and proportions and how they relate to real-world applications.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.6.RP.1. Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.</li> <li>● CCSS.6.RP.2 Understand the concept of a unit rate <math>a/b</math> associated with a ratio <math>a:b</math> with <math>b \neq 0</math>, and use rate language in the context of a ratio relationship.</li> <li>● CCSS.6.RP.3. Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.</li> <li>● CCSS.MP1 Make sense of problems and persevere in solving them.</li> <li>● CCSS.MP3 Construct viable arguments and critique the reasoning of others.</li> <li>● CCSS.MP6 Attend to precision.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● apply their knowledge of ratios and proportions to real-life applications.</li> </ul>	
	<i>Meaning</i>	
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● A ratio or rate describes the relationship between two quantities.</li> <li>● Ratio reasoning can be applied to many different types of mathematical and real-life problems</li> <li>● A rate is a type of ratio that represents a measure or quantity. Therefore the process for solving ratio problems can be applied to rates.</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● What does 100% represent?</li> <li>● How can you define a part to whole relationship?</li> <li>● How can proportions be used for problem solving?</li> <li>● Can you give an example of a rate in a real world setting?</li> <li>● What is the difference between a rate and a ratio?</li> </ul> </td> </tr> </table>	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● A ratio or rate describes the relationship between two quantities.</li> <li>● Ratio reasoning can be applied to many different types of mathematical and real-life problems</li> <li>● A rate is a type of ratio that represents a measure or quantity. Therefore the process for solving ratio problems can be applied to rates.</li> </ul>
<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● A ratio or rate describes the relationship between two quantities.</li> <li>● Ratio reasoning can be applied to many different types of mathematical and real-life problems</li> <li>● A rate is a type of ratio that represents a measure or quantity. Therefore the process for solving ratio problems can be applied to rates.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● What does 100% represent?</li> <li>● How can you define a part to whole relationship?</li> <li>● How can proportions be used for problem solving?</li> <li>● Can you give an example of a rate in a real world setting?</li> <li>● What is the difference between a rate and a ratio?</li> </ul>	
<i>Acquisition</i>		
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● Ratios</li> <li>● Unit Rates</li> <li>● Proportions</li> <li>● Fraction, decimal, percent conversions</li> <li>● Terminating and repeating decimals</li> <li>● ratios as a fraction or percentage</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● Simplifying ratios</li> <li>● Comparing ratios in different formats</li> <li>● Finding equivalent ratios</li> <li>● Calculating unit rate</li> <li>● Finding the missing number in a proportion.</li> </ul>	

<ul style="list-style-type: none"> <li>● CCSS.MP8 Look for and express regularity in repeated reasoning</li> </ul>	<ul style="list-style-type: none"> <li>● equivalent ratios</li> <li>● a rate is a ratio involving units</li> <li>● 100% is all of the original amount</li> <li>● Numbers can be expressed in different formats based on a given situation.</li> </ul>	<ul style="list-style-type: none"> <li>● Converting between fractions, decimals and percents</li> <li>● Finding a missing percent</li> <li>● Finding the percent of a quantity</li> <li>● Solving percent word problems</li> </ul>
<b><i>Used in Content Area Standards</i></b>		<b><i>21<sup>st</sup> Century Skills</i></b>
		<ul style="list-style-type: none"> <li>● Critical Thinking</li> <li>● Collaboration</li> <li>● Communication</li> </ul>

### Stage 2 - Evidence

<b><i>Evaluative Criteria</i></b>	<b><i>Assessment Evidence</i></b>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 6

### Unit 2: Numbers & Operations - Fractions & Decimals

Stage 1 Desired Results		
<p><b>ESTABLISHED GOALS:</b> Students will continue their study of mathematics in the area of numbers and operations. In this unit, students will master fraction and decimal operations and apply them to real-life applications.</p> <p><b>Content Standards:</b></p> <ul style="list-style-type: none"> <li>● CCSS.6.NS.1. Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions.</li> <li>● CCSS.6.NS.2. Fluently divide multi-digit numbers using the standard algorithm.</li> <li>● CCSS.6.NS.3. Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.</li> <li>● CCSS.6.NS.4. Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1-100 with a common factor as a multiple of a sum of two whole numbers with no common factor.</li> <li>● CCSS.MP4 Model with mathematics.</li> <li>● CCSS.MP5 Use appropriate tools strategically.</li> <li>● CCSS.MP7 Look for and make use of structure.</li> </ul>	<b>Transfer</b>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● fluently add, subtract, multiply, and divide rational numbers using the standard algorithm with speed and accuracy without the use of math tools (calculator).</li> <li>● apply their knowledge to real-life applications as well as future algebraic topics</li> </ul>	
	<b>Meaning</b>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Multiplication and division are inverse operations.</li> <li>● Operations on decimals and whole numbers are based upon place value relationships.</li> <li>● Number lines are visual models used to represent the density principle: between any two whole numbers are many rational numbers, including decimals and fractions.</li> <li>● The magnitude of numbers affects the outcome of operations on them.</li> <li>● Computational fluency includes applying the most effective and efficient strategy when applicable.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● Is the product of two numbers always greater than either factor?</li> <li>● Why is the quotient of two fractions larger than the dividend or divisor?</li> <li>● What is the relationship between a mixed number and an improper fraction?</li> <li>● What strategies do you use to find equivalent fractions?</li> <li>● What is the connection between fractions, decimals, and percents?</li> </ul>
	<b>Acquisition</b>	
<p><i>Students will understand:</i></p> <ul style="list-style-type: none"> <li>● Factors</li> <li>● Multiples</li> <li>● Place Value</li> <li>● Reciprocal</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● Dividing fractions by fractions</li> <li>● Dividing decimal numbers</li> <li>● Adding, subtracting, multiplying and dividing mixed numbers</li> </ul>	

	<ul style="list-style-type: none"> <li>• Dividend</li> <li>• Divisor</li> <li>• Quotient</li> <li>• the value of a digit in relationship to its position in a number</li> </ul>	<ul style="list-style-type: none"> <li>• Simplifying numerical expressions using the order of operations.</li> <li>• Finding common factors, greatest common factors, and multiples, least common multiple</li> </ul>
<b><i>Used in Content Area Standards</i></b>		<b><i>21<sup>st</sup> Century Skills</i></b>
		<ul style="list-style-type: none"> <li>• Critical Thinking</li> <li>• Communication</li> <li>• Collaboration</li> </ul>

### Stage 2 - Evidence

<b><i>Evaluative Criteria</i></b>	<b><i>Assessment Evidence</i></b>
	ASSESSMENT: Written Assessments or Projects
	Other Evidence: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 6

### Unit 3: Numbers & Operations - Integers

Stage 1 Desired Results		
<p><b>ESTABLISHED GOALS:</b> Students will continue their study of mathematics in the area of numbers and operations. In this unit, students will understand rational numbers with an emphasis on integers.</p> <p><b>Content Standards:</b></p> <ul style="list-style-type: none"> <li>● CCSS.6.NS.5. Understand that positive and negative numbers are used together to describe quantities having opposite directions or values; use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.</li> <li>● CCSS.6.NS.6. Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.</li> <li>● CCSS.6.NS.7. Understand ordering and absolute value of rational numbers.</li> <li>● CCSS.6.NS.8. Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate plane. Include use of coordinates and absolute value to</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● explain the necessity for both positive and negative numbers.</li> <li>● understand the importance of the sign and direction of a number in real world applications.</li> <li>● discuss the real world significance of an ordered pair as a location on a coordinate plane.</li> </ul>	
	<i>Meaning</i>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Positive and negative numbers are used together to describe quantities having opposite directions or values</li> <li>● All rational numbers can be represented as a point on the number line.</li> <li>● Students will understand that absolute value is the distance from zero on a number line.</li> <li>● The coordinate plane can be used to describe location in two dimensions, defined by an ordered pair.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● How can a number line be used to determine size and direction of a number?</li> <li>● What is the value in distinguishing between positive and negative numbers?</li> <li>● How is the coordinate plane configured?</li> <li>● What are some situations in everyday life where you use negative as well as positive numbers?</li> </ul>
<i>Acquisition</i>		
	<p><i>Students will understand ...</i></p> <ul style="list-style-type: none"> <li>● Integers</li> <li>● Rational Number</li> <li>● Absolute Value</li> <li>● Opposite</li> <li>● Number Line</li> <li>● Coordinate Plane</li> <li>● X Axis</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● Creating a number line with integers</li> <li>● Determining the absolute value, direction, and opposite of a given integer</li> <li>● Writing a number sentence which reflects the actions and changes in real world situations</li> <li>● Graphing with positive and negative coordinates on a coordinate grid</li> </ul>

find distance between points with the same first coordinate or the same second coordinate. <ul style="list-style-type: none"> <li>• CCSS.MP4 Model with mathematics.</li> <li>• CCSS.MP5 Use appropriate tools strategically.</li> <li>• CCSS.MP7 Look for and make use of structure.</li> </ul>	<ul style="list-style-type: none"> <li>• Y Axis</li> <li>• Reflection</li> <li>• Horizontal</li> <li>• Vertical</li> <li>• absolute value as the distance away from zero on a number line</li> </ul>	
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
		<ul style="list-style-type: none"> <li>• Critical Thinking</li> <li>• Communication</li> <li>• Collaboration</li> </ul>

### Stage 2 - Evidence

<i>Evaluative Criteria</i>	<i>Assessment Evidence</i>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 6

### Unit 4: Algebraic Thinking - Expressions

Stage 1 Desired Results		
<p><b>ESTABLISHED GOALS:</b> Students will continue their study of mathematics in the area of Algebraic Thinking. In this unit, students will create, simplify, and evaluate expressions.</p> <p><b>Content Standards:</b></p> <ul style="list-style-type: none"> <li>● CCSS.6.EE.1 Write and evaluate numerical expressions involving whole-number exponents.</li> <li>● CCSS.6.EE.2. Write, read, and evaluate expressions in which letters stand for numbers.</li> <li>● CCSS.6.EE.3. Apply the properties of operations to generate equivalent expressions.</li> <li>● CCSS.6.EE.4. Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them).</li> <li>● CCSS.6.EE.6. Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.</li> <li>● CCSS.MP1 Make sense of problems and persevere in solving them.</li> <li>● CCSS.MP3 Construct viable arguments and critique the reasoning of others.</li> <li>● CCSS.MP7 Look for and make use of structure.</li> </ul>	<b>Transfer</b>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● write algebraic expressions to solve real world problems</li> <li>● use their knowledge of algebraic expressions as they solve algebraic equations</li> </ul>	
	<b>Meaning</b>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Expressions are powerful tools for exploring, reasoning about, and representing situations.</li> <li>● Variables have many different meanings, depending on context and purpose.</li> <li>● Variables permit writing expressions whose values are unknown or vary under different circumstances.</li> <li>● Two or more expressions may be equivalent, even when their symbolic forms differ.</li> <li>● Linear expressions may be added to or subtracted from one another.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● What is meant by an “algebraic expression”?</li> <li>● How can algebraic expressions be used to represent real-life situations?</li> <li>● How is a variable used in the real world?</li> <li>● Why do we need an order of operations?</li> <li>● Why is algebraic reasoning important?</li> </ul>
	<b>Acquisition</b>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● Algebraic expressions</li> <li>● Exponents</li> <li>● Constant</li> <li>● Coefficient</li> <li>● Term</li> <li>● Like Terms</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● simplifying algebraic expressions with whole numbers.</li> <li>● creating algebraic expressions from verbal, written and interpretational expressions</li> <li>● applying and extending previous understandings of arithmetic to algebraic</li> </ul>	

	<ul style="list-style-type: none"> <li>• Variable</li> <li>• Distributive Property</li> </ul>	expressions, including whole number exponents
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
		<ul style="list-style-type: none"> <li>• Collaboration</li> <li>• Critical Thinking</li> <li>• Communication</li> </ul>

### Stage 2 - Evidence

<i>Evaluative Criteria</i>	<i>Assessment Evidence</i>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 6

### Unit 5: Algebraic Thinking - Equations

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the area of Algebraic Thinking. In this unit, students will create and solve one-step questions. They will also use this knowledge in real-life applications.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.6.EE.3. Apply the properties of operations to generate equivalent expressions.</li> <li>● CCSS.6.EE.5. Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.</li> <li>● CCSS.6.EE.7. Solve real-world and mathematical problems by writing and solving equations of the form <math>x + P = q</math> and <math>px = q</math> for cases in which <math>p</math>, <math>q</math> and <math>x</math> are all nonnegative rational numbers.</li> <li>● CCSS.6.EE.8. Write an inequality of the form <math>x &gt; c</math> or <math>x &lt; c</math> have infinitely many solutions; represent solutions of such inequalities on number line diagrams.</li> <li>● CCSS.6.EE.9. Use variable to represent two quantities in a real-world problem that change in relationship to one another; write an equation to</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● use their knowledge of equation writing and solving as a technique for solving problems.</li> </ul>	
	<i>Meaning</i>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Solving an equation is a process of answering a question by finding the value of the variable that makes the equation true.</li> <li>● An equation is two equivalent expressions.</li> <li>● Variables are used to represent two quantities in a real world problem that change in relationship to one another.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● Why do we use inverse operations to solve algebraic equations?</li> <li>● What is a variable in the real world?</li> <li>● How is algebra used in the world we live in every day?</li> <li>● What does it mean to be unequal?</li> </ul>
	<i>Acquisition</i>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● how to solve one-step algebraic equations and inequalities.</li> <li>● the difference between dependent and independent variables.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● Writing an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable.</li> <li>● Writing an equation from data tables and graphs</li> <li>● Defining a variable and create an equation and / or an inequality from a word problem</li> <li>● Solving one step equations and inequalities</li> </ul>	

<p>express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.</p> <ul style="list-style-type: none"> <li>● CCSS.MP1 Make sense of problems and persevere in solving them.</li> <li>● CCSS.MP3 Construct viable arguments and critique the reasoning of others.</li> <li>● CCSS.MP7 Look for and make use of structure.</li> </ul>		
<b><i>Used in Content Area Standards</i></b>		<b><i>21<sup>st</sup> Century Skills</i></b>
		<ul style="list-style-type: none"> <li>● Collaboration</li> <li>● Critical Thinking</li> <li>● Communication</li> </ul>

### Stage 2 - Evidence

<b><i>Evaluative Criteria</i></b>	<b><i>Assessment Evidence</i></b>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 6

### Unit 6: Geometry & Data - Area & Surface Area

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the area of Geometry. In this unit, students will continue their understanding of area, surface area.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.6.G.1. Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.</li> <li>● CCSS.6.G.3. Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.</li> <li>● CCSS.6.G.4. Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● find the surface area of any solid.</li> <li>● apply area formulas when solving real life scenarios.</li> </ul>	
	<i>Meaning</i>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● The area of all 2-dimensional figures can be calculated by breaking irregular shapes into rectangles or triangles.</li> <li>● A three-dimensional figure can be represented by two-dimensional nets, which can help determine the surface area of three-dimensional figures.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● How is geometry part of the world?</li> <li>● How can proportional reasoning help you find the length of a corresponding side of a similar figure?</li> <li>● Why are there different formulas to find the area of different polygons?</li> <li>● How can the use of a coordinate plane aid in finding the area, lengths, and widths of a polygon?</li> <li>● How can a net make it easier to find the surface area of a 3-dimensional object?</li> <li>● How can nets be used to find surface area on irregular polygons?</li> </ul>
	<i>Acquisition</i>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● Length</li> <li>● Width</li> <li>● Parallelogram</li> <li>● Altitude</li> <li>● Trapezoid</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● calculating the area of irregular shapes (composite figures).</li> <li>● drawing a net for a given solid.</li> <li>● identifying faces, edges and vertices.</li> </ul>	

<p>mathematical problems. CCSS.MP1 Make sense of problems and persevere in solving them.</p> <ul style="list-style-type: none"> <li>● CCSS.MP6 Attend to precision.</li> <li>● CCSS.MP8 Look for and express regularity in repeated reasoning.</li> </ul>	<ul style="list-style-type: none"> <li>● Area as space inside a figure</li> <li>● Area of a parallelogram <math>A = bh</math></li> <li>● Area of a triangle <math>A = \frac{1}{2} bh</math></li> <li>● Area of a trapezoid <math>A = \frac{1}{2} (b_1 + b_2)h</math></li> <li>● Units squared</li> <li>● Net</li> <li>● Surface Area</li> <li>● Area</li> <li>● Composite Figures</li> <li>● Kite</li> <li>● Compose</li> <li>● decompose</li> <li>● irregular shapes</li> <li>● Two-dimensional figures</li> <li>● three-dimensional figures</li> <li>● faces, edges, vertices.</li> <li>● Solid</li> <li>● prism</li> <li>● lateral surface area</li> <li>● area is the surface inside a flat, closed figure.</li> <li>● irregular shapes are the combination of multiple figures.</li> <li>● nets are three-dimensional figures drawn on a surface.</li> <li>● surface area is the sum of the areas of all faces.</li> </ul>	<ul style="list-style-type: none"> <li>● calculating surface area of rectangular prisms.</li> <li>● Calculating area and surface area using models</li> <li>● Fluently, calculating area and surface area using formulas</li> <li>● Calculating surface area of rectangular prisms</li> </ul>
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
		<ul style="list-style-type: none"> <li>● Collaboration</li> <li>● Critical Thinking</li> <li>● Communication</li> </ul>

### Stage 2 - Evidence

<i>Evaluative Criteria</i>	<i>Assessment Evidence</i>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 6

### Unit 7: Geometry & Data - Volume

#### Stage 1 Desired Results

<p><b>ESTABLISHED GOALS:</b> Students will continue their study of mathematics in the area of Geometry. In this unit, students will continue their understanding of volume.</p> <p><b>Content Standards:</b></p> <ul style="list-style-type: none"> <li>● CCSS.6.G.2. Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas <math>V = l w h</math> and <math>V = b h</math> to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.</li> <li>● CCSS.MP1 Make sense of problems and persevere in solving them.</li> <li>● CCSS.MP6 Attend to precision.</li> <li>● CCSS.MP8 Look for and express regularity in repeated reasoning</li> </ul>	<b>Transfer</b>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● apply volume formulas in the context of solving real-world problems</li> <li>● explain the difference between surface area and volume of objects.</li> </ul>	
	<b>Meaning</b>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Volume is the number of cubes that can fit inside of a solid.</li> <li>● The generic formula for volume is the area of the base multiplied by the height.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● What does volume mean?</li> <li>● How can the volume of a triangular prism be found by placing unit cubes inside it?</li> </ul>
	<b>Acquisition</b>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● Polygon</li> <li>● Polyhedron</li> <li>● Edge</li> <li>● Vertex</li> <li>● Length</li> <li>● Width</li> <li>● Depth</li> <li>● Cubic Units</li> <li>● Formula: <math>V=LWH</math> or <math>V=Bh</math></li> <li>● Irregular Figures</li> <li>● Prism</li> <li>● volume as the space inside a solid.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● Finding volume by packing it with unit cubes of the appropriate unit fraction edge lengths (modeling)</li> <li>● Calculating volume using models</li> <li>● Fluently calculating volume using formulas</li> <li>● Solving real word problems involving volume</li> </ul>	

<i>Used in Content Area Standards</i>	<i>21<sup>st</sup> Century Skills</i>
	<ul style="list-style-type: none"> <li>● Collaboration</li> <li>● Critical Thinking</li> <li>● Communication</li> </ul>

<b>Stage 2 - Evidence</b>	
<i>Evaluative Criteria</i>	<i>Assessment Evidence</i>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 6

### Unit 8: Geometry & Data - Statistics & Probability

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the area of Data. In this unit, students will continue their understanding of data analysis and statistical graphs.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.6.SP.1. Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.</li> <li>CCSS.6.SP.2. Understand that a set of data collected to answer a statistical question has a distribution, which can be described by its center, spread, and overall shape.</li> <li>● CCSS.6.SP.3. Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.</li> <li>● CCSS.6.SP.4. Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</li> <li>● CCSS.6.SP.5. Summarize numerical data sets in relation to their context, such as by:</li> <li>● CCSS.6.SP.5. a. Reporting the number observations.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● analyze graphs found in multiple sources</li> <li>● describe data using graphs and measures of central tendency.</li> </ul>	
	<i>Meaning</i>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● A statistical question anticipates variability in the data related to the question and accounts for it in the answers.</li> <li>● A set of data collected to answer a statistical question has a distribution, which can be described by its center, spread, and overall shape.</li> <li>● A measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● How are statistics used to collect, analyze, and draw conclusions in today's society?</li> <li>● Why are statistics important in the world?</li> <li>● What are the ways that data can be represented visually?</li> <li>● Why is it better to use different graphs and diagrams to understand data?</li> <li>● What are the different ways in which we can summarize data sets?</li> </ul>
	<i>Acquisition</i>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● Variability</li> <li>● Data</li> <li>● statistical questioning</li> <li>● statistical process</li> <li>● Sample</li> <li>● bar graph</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● Determining measures of central tendency and variation</li> <li>● Choosing which measure of central tendency is appropriate for a given set of points</li> <li>● Analyzing data from a given dot plot, histogram, and box plots</li> </ul>	

<ul style="list-style-type: none"> <li>● CCSS.6.SP.5. b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</li> <li>● CCSS.6.SP.5. c. Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.</li> <li>● CCSS.6.SP.5. d. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.</li> </ul> <p>CCSS.MP2 Reason abstractly and quantitatively.</p> <ul style="list-style-type: none"> <li>● CCSS.MP4 Model with mathematics.</li> <li>● CCSS.MP5 Use appropriate tools strategically.</li> <li>● CCSS.MP6 Attend to precision</li> </ul>	<ul style="list-style-type: none"> <li>● Frequency</li> <li>● Mode</li> <li>● dot plot</li> <li>● Distribution</li> <li>● Symmetric</li> <li>● Outliers</li> <li>● Histogram</li> <li>● Measure of center</li> <li>● Median</li> <li>● balance point</li> <li>● Mean</li> <li>● measures of variation</li> <li>● Range</li> <li>● Quartile</li> <li>● Interquartile range (IQR)</li> <li>● Box-and-whisker plot</li> <li>● Deviation</li> <li>● Absolute Deviation</li> <li>● Mean Absolute Deviation</li> <li>● misleading data</li> <li>● statistical variability</li> <li>● line plots</li> <li>● scatter plots</li> </ul>	<ul style="list-style-type: none"> <li>● Reporting observations about data using mathematical vocabulary: giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation).</li> </ul>
<b><i>Used in Content Area Standards</i></b>		<b><i>21<sup>st</sup> Century Skills</i></b>
		<ul style="list-style-type: none"> <li>● Communication</li> <li>● Critical Thinking</li> <li>● Perseverance</li> </ul>

## Stage 2 - Evidence

<b><i>Evaluative Criteria</i></b>	<b><i>Assessment Evidence</i></b>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

Title of Curriculum: 6th Grade Accelerated Math

Unit Name	What (content, vocab)	Why (enduring understandings)	How (skills)
<b>Unit 1: Number and Operations: Ratios and Proportional Relationships</b>	<ul style="list-style-type: none"> <li>● Ratios</li> <li>● Unit Rates</li> <li>● Proportions</li> <li>● Fraction, decimal, percent conversions</li> <li>● Terminating and repeating decimals</li> <li>● ratios as a fraction or percentage</li> <li>● equivalent ratios</li> <li>● a rate is a ratio involving units</li> <li>● 100% is all of the original amount</li> </ul>	<ul style="list-style-type: none"> <li>● A ratio or rate describes the relationship between two quantities.</li> <li>● Ratio reasoning can be applied to many different types of mathematical and real-life problems</li> <li>● A rate is a type of ratio that represents a measure or quantity. Therefore the process for solving ratio problems can be applied to rates.</li> </ul>	<ul style="list-style-type: none"> <li>● Simplify ratios</li> <li>● Compare ratios in different formats</li> <li>● Find equivalent ratios</li> <li>● Calculate unit rate</li> <li>● Find a missing number in a proportion</li> <li>● Convert between fractions, decimals and percents</li> <li>● Find a missing percent</li> <li>● Find percent of a quantity.</li> <li>● Solve percent real world problems</li> </ul>
<b>Unit 2: Number and Operations: Fractions and Decimals</b>	<ul style="list-style-type: none"> <li>● Factors</li> <li>● Multiples</li> <li>● Place Value</li> <li>● Reciprocal</li> <li>● Dividend</li> <li>● Divisor</li> <li>● Quotient</li> <li>● the value of a digit in relationship to its position in a number</li> <li>● Positive exponents</li> </ul>	<ul style="list-style-type: none"> <li>● Multiplication and division are inverse operations.</li> <li>● Operations on decimals and whole numbers are based upon place value relationships.</li> <li>● Number lines are visual models used to represent the density principle: between any two whole numbers are many rational numbers, including decimals and fractions.</li> <li>● The magnitude of numbers affects the outcome of operations on them.</li> <li>● Computational fluency includes applying the most effective and efficient strategy when applicable.</li> </ul>	<ul style="list-style-type: none"> <li>● Divide fractions by fractions</li> <li>● Find common factors, greatest common factors, and multiples, least common multiple</li> <li>● Add, subtract, multiply and divide mixed numbers</li> <li>● Divide decimals</li> <li>● Simplify numerical expressions using the order of operations</li> </ul>

<p><b>Unit 3: Numbers and Operations: Integers</b></p>	<ul style="list-style-type: none"> <li>● Integers</li> <li>● Rational Numbers</li> <li>● Absolute Value</li> <li>● Coordinate Grid</li> <li>● Opposite</li> <li>● Number Line</li> <li>● Coordinate Plane</li> <li>● X Axis</li> <li>● Y Axis</li> <li>● Reflection</li> <li>● Horizontal</li> <li>● Vertical</li> </ul>	<ul style="list-style-type: none"> <li>● Positive and negative numbers are used together to describe quantities having opposite directions(number line) or values</li> <li>● All rational numbers can be represented as a point on a number line</li> <li>● Understand that absolute value is the distance from zero on a number line</li> <li>● The coordinate plane can be used to describe a location in two dimensions, defined by an ordered pair</li> <li>● Ordering and absolute value of rational numbers</li> <li>● Write, interpret and explain statements of order for rational numbers in real world context</li> </ul>	<ul style="list-style-type: none"> <li>● Create a number line with integers</li> <li>● Understand the relationship between a positive or negative number and its opposite</li> <li>● Determine the absolute value, direction of number line movement, and opposite of a given integer</li> <li>● Write a number sentence which reflects the actions and changes in real world situations</li> <li>● Graph with positive and negative coordinates on a coordinate grid</li> <li>● Add, subtract, multiply and divide integers</li> </ul>
<p><b>Unit 4: Algebraic Thinking: Expressions</b></p>	<ul style="list-style-type: none"> <li>● Algebraic expressions</li> <li>● Exponents</li> <li>● Constant</li> <li>● Coefficient</li> <li>● Term</li> <li>● Like Terms</li> <li>● Variable</li> <li>● Distributive Property</li> <li>● Integer</li> <li>● Rational number</li> </ul>	<ul style="list-style-type: none"> <li>● Expressions are powerful tools for exploring, reasoning about, and representing situations.</li> <li>● Variables have many different meanings, depending on context and purpose.</li> <li>● Variables permit writing expressions whose values are unknown or vary under different circumstances.</li> <li>● Two or more expressions may be equivalent, even when their symbolic forms differ.</li> <li>● Linear expressions may be</li> </ul>	<ul style="list-style-type: none"> <li>● simplify algebraic expressions with whole numbers.</li> <li>● create algebraic expressions from verbal, written and interpretational expressions</li> <li>● apply and extend previous understandings of arithmetic to algebraic expressions, including whole number exponents</li> </ul>

		added to or subtracted from one another.	
<b>Unit 5: Algebraic Thinking: Equations</b>	<ul style="list-style-type: none"> <li>● multi-step algebraic equations and inequalities</li> <li>● dependent and independent variables.</li> <li>● Integers</li> <li>● Like terms</li> <li>● Rational numbers</li> <li>● like terms</li> <li>● equivalent expressions</li> </ul>	<ul style="list-style-type: none"> <li>● Solving an equation is a process of answering a question by finding the value of the variable that makes the equation true.</li> <li>● An equation is two equivalent expressions.</li> <li>● Variables are used to represent two quantities in a real world problem that change in relationship to one another.</li> </ul>	<ul style="list-style-type: none"> <li>● Write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable.</li> <li>● Write an equation from data tables and graphs</li> <li>● Define a variable and create an equation and / or an inequality from a word problem</li> <li>● Solve multi step equations and inequalities</li> </ul>
<b>Unit 6: Geometry and Data: Area and Surface Area</b>	<ul style="list-style-type: none"> <li>● Length</li> <li>● Width</li> <li>● Parallelogram</li> <li>● Altitude</li> <li>● Trapezoid</li> <li>● Area as space inside a figure</li> <li>● Area of a parallelogram <math>A = bh</math></li> <li>● Area of a triangle <math>A = \frac{1}{2} bh</math></li> <li>● Area of a trapezoid <math>A = \frac{1}{2} (b_1 + b_2)h</math></li> <li>● Units squared</li> <li>● Net</li> <li>● Surface Area</li> <li>● Composite (irregular) Figures</li> <li>● Kite</li> <li>● irregular shapes</li> <li>● Two-dimensional figures</li> <li>● three-dimensional figures</li> <li>● faces, edges, vertices.</li> <li>● Solid</li> </ul>	<ul style="list-style-type: none"> <li>● The area of all 2-dimensional figures can be calculated by breaking irregular shapes into rectangles or triangles.</li> <li>● A three-dimensional figure can be represented by two-dimensional nets, which can help determine the surface area of three-dimensional figures.</li> </ul>	<ul style="list-style-type: none"> <li>● calculating the area of irregular shapes (composite figures).</li> <li>● drawing a net for a given solid.</li> <li>● identifying faces, edges and vertices.</li> <li>● calculating surface area of rectangular prisms.</li> <li>● Calculating area and surface area using models</li> <li>● Fluently, calculating area and surface area using formulas</li> <li>● Calculating surface area of rectangular prisms, triangular prisms, cone and cylinder and pyramids</li> </ul>

	<ul style="list-style-type: none"> <li>• prism</li> <li>• lateral surface area</li> <li>• Radius</li> <li>• Circumference</li> <li>• Diameter</li> <li>• Pi</li> </ul>		
<b>Unit 7: Geometry and Data: Triangles</b>	<ul style="list-style-type: none"> <li>• 180 degrees in every triangle.</li> <li>• classifications of triangles for both sides and angles: acute, obtuse, right, scalene, isosceles, equilateral</li> <li>• supplementary, complementary, vertical, and adjacent angles</li> <li>• Angle pair relationships: adjacent, vertical, complementary, supplementary, linear pair</li> </ul>	<ul style="list-style-type: none"> <li>• Drawings and constructions help to see the relationships and differences between geometrical figures.</li> <li>• Analyzing geometric relationships develops reasoning and justification skills.</li> <li>• Angle relationships can be used to determine missing angle measures in diagrams.</li> </ul>	<ul style="list-style-type: none"> <li>• Create triangles given specific sides and/or angles</li> <li>• Determine the missing angles in triangles</li> <li>• Classify triangles by their sides and angles</li> <li>• Identify values of angles in complementary and supplementary relationships</li> <li>• Use vertical, complementary, and supplementary angle relationships to find missing angles</li> <li>• Solve for unknown angles using equations</li> </ul>
<b>Unit 8: Geometry and Data: Volume</b>	<ul style="list-style-type: none"> <li>• Polygon</li> <li>• Polyhedron</li> <li>• Edge</li> <li>• Vertex</li> <li>• Length</li> <li>• Width</li> <li>• Depth</li> <li>• Cubic Units</li> <li>• Formula: <math>V=LWH</math> or <math>V=Bh</math></li> <li>• Irregular Figures</li> <li>• Prism</li> <li>• volume as the space inside a solid.</li> </ul>	<ul style="list-style-type: none"> <li>• Area, surface area and volume have applications in real world situations.</li> <li>• Dimension is a measure of the width, height, or length of a figure.</li> <li>• Different 3-dimensional figures can have the same volume even if the dimensions are not all the same.</li> </ul>	<ul style="list-style-type: none"> <li>• Calculate volume using models</li> <li>• Fluently calculate volume using formulas</li> <li>• Apply the formulas for volume of three- dimensional figures</li> <li>• Differentiate between volume and the surface area to solve problem for three-dimensional figures</li> <li>• Calculate and explain how to find the area, volume, and surface area for two- and three- dimensional objects from real-world situations</li> </ul>
<b>Unit 9: Geometry and Data: Statistics and Probability</b>	<ul style="list-style-type: none"> <li>• Data</li> <li>• statistical questioning</li> </ul>	<ul style="list-style-type: none"> <li>• A statistical question anticipates variability in the data related to</li> </ul>	<ul style="list-style-type: none"> <li>• Determine measures of central tendency</li> </ul>

	<ul style="list-style-type: none"> <li>● Sample</li> <li>● bar graph, histogram</li> <li>● Frequency</li> <li>● dot plots, line plots, scatter plots</li> <li>● Distribution</li> <li>● Symmetric</li> <li>● Outliers</li> <li>● Measure of center: Median, Mean, Mode</li> <li>● balance point</li> <li>● measures of variation: range, quartile, interquartile range (IQR), absolute deviation, mean absolute deviation</li> <li>● Box-and-whisker plot</li> <li>● misleading data</li> <li>● statistical variability</li> </ul>	<p>the question and accounts for it in the answers.</p> <ul style="list-style-type: none"> <li>● A set of data collected to answer a statistical question has a distribution, which can be described by its center, spread, and overall shape.</li> <li>● A measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.</li> </ul>	<ul style="list-style-type: none"> <li>● Choose which measure of central tendency is most appropriate for a given set of points</li> <li>● Analyze data from given dot plots, histograms and box plots</li> <li>● Report observations about data using mathematical vocabulary</li> <li>● Make predictions from graphs</li> <li>● Summarize and describe distributions using both measures of central tendency as well as variation data</li> </ul>
--	--	---	---

# Windham School District Curriculum

## Accelerated Math - Grade 6

### Unit 1: Number & Operations

### Ratios & Proportional Relationships

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the area of numbers and operations. In this unit, students will explore the concepts and ratios and proportions and how they relate to real-world applications.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.6.RP.1. Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.</li> <li>● CCSS.6.RP.2 Understand the concept of a unit rate <math>a/b</math> associated with a ratio <math>a:b</math> with <math>b \neq 0</math>, and use rate language in the context of a ratio relationship.</li> <li>● CCSS.6.RP.3. Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.</li> <li>● CCSS.MP1 Make sense of problems and persevere in solving them.</li> <li>● CCSS.MP3 Construct viable arguments and critique the reasoning of others.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● apply their knowledge of ratios and proportions to real-life applications.</li> </ul>	
	<i>Meaning</i>	
	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● A ratio or rate describes the relationship between two quantities.</li> <li>● Ratio reasoning can be applied to many different types of mathematical and real-life problems</li> <li>● A rate is a type of ratio that represents a measure or quantity. Therefore the process for solving ratio problems can be applied to rates.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● What does 100% represent?</li> <li>● How can you define a part to whole relationship?</li> <li>● How can proportions be used for problem solving?</li> <li>● Can you give an example of a rate in a real world setting?</li> <li>● What is the difference between a rate and a ratio?</li> </ul>
<i>Acquisition</i>		
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● ratios</li> <li>● unit rates</li> <li>● proportions</li> <li>● Fraction, decimals percent connections</li> <li>● Terminating and repeating decimals</li> <li>● Ratio as a fraction or percentage</li> <li>● Equivalent ratios</li> <li>● A rate is a ratio involving units</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● Simplifying ratios</li> <li>● Comparing ratios in different formats</li> <li>● Finding equivalent ratios</li> <li>● Calculating unit rate</li> <li>● Finding the missing number in a proportion.</li> <li>● Conversions between fractions, decimals and percents</li> <li>● Finding a missing percent</li> </ul>	

<ul style="list-style-type: none"> <li>● CCSS.MP6 Attend to precision.</li> <li>● CCSS.MP8 Look for and express regularity in repeated reasoning</li> </ul>	<ul style="list-style-type: none"> <li>● 100% is all of the original amount</li> <li>● Numbers can be expressed in different formats based on a given situation</li> </ul>	<ul style="list-style-type: none"> <li>● Finding the percent of a quantity</li> <li>● Solving percent word problems</li> </ul>
<b><i>Used in Content Area Standards</i></b>		<b><i>21<sup>st</sup> Century Skills</i></b>
		<ul style="list-style-type: none"> <li>● Critical Thinking</li> <li>● Collaboration</li> <li>● Communication</li> </ul>

### Stage 2 - Evidence

<b><i>Evaluative Criteria</i></b>	<b><i>Assessment Evidence</i></b>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Accelerated Math - Grade 6

### Unit 2: Number & Operations - Fractions & Decimals

Stage 1 Desired Results		
<p><b>ESTABLISHED GOALS:</b> Students will continue their study of mathematics in the area of numbers and operations. In this unit, students will master fraction and decimal operations and apply them to real-life applications.</p> <p><b>Content Standards:</b></p> <ul style="list-style-type: none"> <li>● CCSS.6.NS.1. Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions.</li> <li>● CCSS.6.NS.2. Fluently divide multi-digit numbers using the standard algorithm.</li> <li>● CCSS.6.NS.3. Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.</li> <li>● CCSS.6.NS.4. Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1-100 with a common factor as a multiple of a sum of two whole numbers with no common factor.</li> <li>● CCSS.MP4 Model with mathematics.</li> <li>● CCSS.MP5 Use appropriate tools strategically.</li> <li>● CCSS.MP7 Look for and make use of structure.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● fluently perform all operations on positive rational numbers with speed and accuracy without the use of math tools (calculator)</li> <li>● apply this knowledge to real-life applications as well as future algebraic topics.</li> </ul>	
	<i>Meaning</i>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Multiplication and division are inverse operations.</li> <li>● Operations on decimals and whole numbers are based on place value relationships.</li> <li>● Number lines are visual models used to represent the density principle: between any two whole numbers are many rational numbers, including decimals and fractions.</li> <li>● The magnitude of numbers affects the outcome of operations on them.</li> <li>● Computational fluency includes applying the most effective and efficient strategy when applicable.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● Is the product of two numbers always greater than either factor?</li> <li>● Why is the quotient of two fractions larger than the dividend or divisor?</li> <li>● What is the relationship between a mixed number and an improper fraction?</li> <li>● What strategies do you use to find equivalent fractions?</li> <li>● What is the connection between fractions, decimals, and percents?</li> </ul>
	<i>Acquisition</i>	
<p><i>Students will understand ...</i></p> <ul style="list-style-type: none"> <li>● Factors</li> <li>● Multiples</li> <li>● Place value</li> <li>● Reciprocal</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● Dividing fractions by fractions</li> <li>● Dividing decimal numbers</li> <li>● Adding, subtracting, multiplying and dividing mixed numbers</li> </ul>	

	<ul style="list-style-type: none"> <li>• Dividend</li> <li>• Divisor</li> <li>• quotient</li> <li>• the value of a digit in relationship to its position in a number</li> <li>• positive exponents</li> </ul>	<ul style="list-style-type: none"> <li>• Simplifying numerical expressions using the order of operations.</li> <li>• Finding common factors, greatest common factors, and multiples, least common multiple</li> </ul>
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
		<ul style="list-style-type: none"> <li>• Critical Thinking</li> <li>• Communication</li> <li>• Collaboration</li> </ul>

### Stage 2 - Evidence

<i>Evaluative Criteria</i>	<i>Assessment Evidence</i>
	ASSESSMENT: Written Assessments or Projects
	Other Evidence: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Accelerated Math - Grade 6

### Unit 3: Number & Operations - Integers

<b>Stage 1 Desired Results</b>		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the area of numbers and operations. In this unit, students will understand rational numbers with an emphasis on integers.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.6.NS.5. Understand that positive and negative numbers are used together to describe quantities having opposite directions or values; use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.</li> <li>● CCSS.6.NS.6. Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.</li> <li>● CCSS.6.NS.7. Understand ordering and absolute value of rational numbers.</li> <li>● CCSS.6.NS.8. Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate plane. Include use of coordinates and absolute value to</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● explain the necessity for both positive and negative numbers.</li> <li>● understand the significance of a number having both a sign and direction.</li> <li>● Discuss the real world significance of an ordered pair as a location on a coordinate plane (for example: on a map)</li> <li>● Fluently perform operations on integers</li> </ul>	
	<i>Meaning</i>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Positive and negative numbers are used together to describe quantities having opposite directions with the same values</li> <li>● All rational numbers can be represented as a point on the number line.</li> <li>● Absolute value is the distance from zero on a number line.</li> <li>● The coordinate plane can be used to describe location in two dimensions, defined by an ordered pair.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● How can a number line be used to determine size and direction of a number?</li> <li>● What is the value in distinguishing between positive and negative numbers?</li> <li>● How is the coordinate plane configured?</li> <li>● What are some situations in everyday life where you use negative as well as positive numbers?</li> </ul>
<i>Acquisition</i>		
<p><i>Students will understand ...</i></p> <ul style="list-style-type: none"> <li>● Integers</li> <li>● Rational number</li> <li>● Absolute value</li> <li>● Opposite</li> <li>● Number line</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● Creating a number line with integers</li> <li>● Understanding the relationship between a positive or negative number and its opposite</li> <li>● Determining the absolute value, direction, and opposite of a given integer</li> </ul>	

find distance between points with the same first coordinate or the same second coordinate. <ul style="list-style-type: none"> <li>● CCSS.MP4 Model with mathematics.</li> <li>● CCSS.MP5 Use appropriate tools strategically.</li> <li>● CCSS.MP7 Look for and make use of structure.</li> </ul>	<ul style="list-style-type: none"> <li>● Coordinate plane</li> <li>● x-axis</li> <li>● y-axis</li> <li>● Reflection</li> <li>● Horizontal</li> <li>● vertical</li> <li>● absolute value as the distance away from zero on a number line</li> </ul>	<ul style="list-style-type: none"> <li>● Writing a number sentence which reflects the actions and changes in real world situations</li> <li>● Graphing with positive and negative coordinates on a coordinate grid</li> <li>● Add, subtract, multiply and divide integers</li> </ul>
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
		<ul style="list-style-type: none"> <li>● Critical Thinking</li> <li>● Communication</li> <li>● Collaboration</li> </ul>

### Stage 2 - Evidence

<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	ASSESSMENT: Written Assessments or Projects
	Other Evidence: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Accelerated Math - Grade 6

### Unit 4: Algebraic Thinking - Expressions

Stage 1 Desired Results		
<p>ESTABLISHED GOALS:</p> <p>Students will continue their study of mathematics in the area of Algebraic Thinking. In this unit, students will create, simplify, and evaluate expressions.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.6.EE.1 Write and evaluate numerical expressions involving whole-number exponents.</li> <li>● CCSS.6.EE.2. Write, read, and evaluate expressions in which letters stand for numbers.</li> <li>● CCSS.6.EE.3. Apply the properties of operations to generate equivalent expressions.</li> <li>● CCSS.6.EE.4. Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them).</li> <li>● CCSS.6.EE.6. Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.</li> <li>● CCSS.MATH.CONTENT.7.EE.A.1 Apply properties of operations as strategies to add, subtract, factor,</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● write algebraic expressions to solve real world problems</li> <li>● use their knowledge of algebraic expressions as they solve algebraic equations</li> </ul>	
	<i>Meaning</i>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Expressions are powerful tools for exploring, reasoning about, and representing situations.</li> <li>● Variables have many different meanings, depending on context and purpose.</li> <li>● Variables permit writing expressions whose values are unknown or vary under different circumstances.</li> <li>● Two or more expressions may be equivalent, even when their symbolic forms differ.</li> <li>● Linear expressions may be added to or subtracted from one another.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● What is meant by an “algebraic expression”?</li> <li>● How can algebraic expressions be used to represent real-life situations?</li> <li>● How is a variable used in the real world?</li> <li>● Why do we need an order of operations?</li> <li>● Why is algebraic reasoning important?</li> </ul>
	<i>Acquisition</i>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● Algebraic expressions</li> <li>● Exponents</li> <li>● Constant</li> <li>● Coefficient</li> <li>● Term</li> <li>● Like Terms</li> <li>● Variable</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● simplifying algebraic expressions with whole numbers.</li> <li>● creating algebraic expressions from verbal, written and interpretational expressions</li> <li>● applying and extending previous understandings of arithmetic to algebraic expressions, including whole number</li> </ul>	

<p>and expand linear expressions with rational coefficients.</p> <ul style="list-style-type: none"> <li>● CCSS.MATH.CONTENT.7.EE.A.2 Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. <i>For example, <math>a + 0.05a = 1.05a</math> means that "increase by 5%" is the same as "multiply by 1.05."</i></li> <li>● CCSS.MP1 Make sense of problems and persevere in solving them.</li> <li>● CCSS.MP3 Construct viable arguments and critique the reasoning of others.</li> <li>● CCSS.MP7 Look for and make use of structure.</li> </ul>	<ul style="list-style-type: none"> <li>● Distributive Property</li> <li>● Integer</li> <li>● Rational number</li> </ul>	<p>exponents</p>
<b><i>Used in Content Area Standards</i></b>		<b><i>21<sup>st</sup> Century Skills</i></b>
		<ul style="list-style-type: none"> <li>● Collaboration</li> <li>● Critical Thinking</li> <li>● Communication</li> </ul>

## Stage 2 - Evidence

<b><i>Evaluative Criteria</i></b>	<b><i>Assessment Evidence</i></b>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Accelerated Math - Grade 6

### Unit 5: Algebraic Thinking - Equations

Stage 1 Desired Results		
<p><b>ESTABLISHED GOALS:</b> Students will continue their study of mathematics in the area of Algebraic Thinking. In this unit, students will create and solve multi-step equations. They will also use this knowledge in real-life applications.</p> <p><b>Content Standards:</b></p> <ul style="list-style-type: none"> <li>● CCSS.6.EE.3. Apply the properties of operations to generate equivalent expressions.</li> <li>● CCSS.6.EE.5. Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.</li> <li>● CCSS.6.EE.7. Solve real-world and mathematical problems by writing and solving equations of the form <math>x + P = q</math> and <math>px = q</math> for cases in which <math>p</math>, <math>q</math> and <math>x</math> are all nonnegative rational numbers.</li> <li>● CCSS.6.EE.8. Write an inequality of the form <math>x &gt; c</math> or <math>x &lt; c</math> have infinitely many solutions; represent solutions of such inequalities on number line diagrams.</li> <li>● CCSS.6.EE.9. Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to</li> </ul>	<b>Transfer</b>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● write and solve equations as a technique for solving problems</li> <li>● analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.</li> </ul>	
	<b>Meaning</b>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Solving an equation is a process of answering a question by finding the value of the variable that makes the equation true.</li> <li>● An equation is two equivalent expressions.</li> <li>● Variables are used to represent two quantities in a real world problem that change in relationship to one another.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● Why do we use inverse operations to solve algebraic equations?</li> <li>● What is a variable in the real world?</li> <li>● How is algebra used in the world we live in every day?</li> <li>● What does it mean to be unequal?</li> </ul>
<b>Acquisition</b>		
	<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● multi-step algebraic equations and inequalities.</li> <li>● the difference between dependent and independent variables.</li> <li>● Integers</li> <li>● Like terms</li> <li>● Rational numbers</li> <li>● like terms</li> <li>● equivalent expressions</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● Solving multi-step equations and inequalities</li> <li>● Writing an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable.</li> <li>● Writing an equation from data tables and graphs</li> <li>● Defining a variable and creating an equation and / or an inequality from a word problem</li> </ul>

<p>express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.</p> <ul style="list-style-type: none"> <li>● CCSS.MATH.CONTENT.7.EE.B.4: Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.</li> <li>● CCSS.MP1 Make sense of problems and persevere in solving them.</li> <li>● CCSS.MP3 Construct viable arguments and critique the reasoning of others.</li> <li>● CCSS.MP7 Look for and make use of structure.</li> </ul>		
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
		<ul style="list-style-type: none"> <li>● Collaboration</li> <li>● Critical Thinking</li> <li>● Communication</li> </ul>

<b>Stage 2 - Evidence</b>	
<b><i>Evaluative Criteria</i></b>	<b><i>Assessment Evidence</i></b>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Accelerated Math - Grade 6

### Unit 6: Geometry & Data - Area & Surface Area

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the area of Geometry. In this unit, students will continue to build their understanding of area and surface area and use it to solve problems.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.6.G.1. Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.</li> <li>● CCSS.6.G.3. Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.</li> <li>● CCSS.6.G.4. Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● find the surface area of any solid</li> <li>● apply area formulas when solving real life scenarios</li> </ul>	
	<i>Meaning</i>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● The area of all 2-dimensional figures can be calculated by breaking irregular shapes into rectangles or triangles.</li> <li>● A three-dimensional figure can be represented by 2-dimensional nets, which can help determine the surface area of three-dimensional figures.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● How is geometry part of the world?</li> <li>● Why are there different formulas to find the area of different polygons?</li> <li>● How can a net make it easier to find the surface area of a 3-dimensional object?</li> <li>● How can nets be used to find surface area on irregular polygons?</li> </ul>
	<i>Acquisition</i>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● Dimensions: Length, width, altitude</li> <li>● Parallelogram, trapezoid, kite</li> <li>● Area as space inside a figure</li> <li>● Area of a parallelogram <math>A = bh</math></li> <li>● Area of a triangle <math>A = \frac{1}{2} bh</math></li> <li>● Area of a trapezoid <math>A = \frac{1}{2} (b_1 + b_2)h</math></li> <li>● Units squared</li> <li>● Composite (irregular) Figures</li> <li>● Two-dimensional figures</li> <li>● three-dimensional figures (solids)</li> <li>● faces, edges, vertices.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● calculating the area of irregular shapes (composite figures).</li> <li>● Calculate the area and circumference of circles.</li> <li>● drawing a net for a given solid.</li> <li>● identifying faces, edges and vertices.</li> <li>● calculating surface area of rectangular prisms.</li> <li>● Calculate area and surface area using models and formulas</li> <li>● Calculate surface area of rectangular prisms, triangular prisms, cones, cylinders, and pyramids</li> </ul>	

<ul style="list-style-type: none"> <li>● CCSS.7.G.4 Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.</li> <li>● CCSS.7.G.6 Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.</li> <li>● CCSS.MP1 Make sense of problems and persevere in solving them.</li> <li>● CCSS.MP6 Attend to precision.</li> <li>● CCSS.MP8 Look for and express regularity in repeated reasoning.</li> </ul>	<ul style="list-style-type: none"> <li>● prism</li> <li>● nets are three-dimensional figures drawn on a surface.</li> <li>● surface area and lateral surface area</li> <li>● Radius and diameter of a circle</li> <li>● Circumference</li> <li>● Pi</li> </ul>	
<b><i>Used in Content Area Standards</i></b>		<b><i>21<sup>st</sup> Century Skills</i></b>
		<ul style="list-style-type: none"> <li>● Collaboration</li> <li>● Critical Thinking</li> <li>● Communication</li> </ul>

### Stage 2 - Evidence

<b><i>Evaluative Criteria</i></b>	<b><i>Assessment Evidence</i></b>
	ASSESSMENT: Written Assessments or Projects
	Other Evidence: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Accelerated Math - Grade 6

### Unit 7: Geometry - Triangles

#### Stage 1 Desired Results

<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the area of geometry. In this unit, students will gain a deeper understanding of angles and triangles and will solve real-world problems involving geometric figures.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.7.G.2. Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.</li> <li>● CCSS.MATH.CONTENT.7.G.B.5: Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.</li> <li>● CCSS.MP4 Model with mathematics.</li> <li>● CCSS.MP5 Use appropriate tools strategically.</li> <li>● CCSS.MP6 Attend to precision.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● use their knowledge of triangles to solve real-world problems involving geometric figures.</li> </ul>	
	<i>Meaning</i>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Drawings and constructions help to see the relationships and differences between geometrical figures.</li> <li>● Analyzing geometric relationships develops reasoning and justification skills.</li> <li>● Angle relationships can be used to determine missing angle measures in diagrams.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● How do geometric models describe spatial relationships?</li> <li>● How are geometric shapes and objects classified?</li> <li>● What are the major classifications and relationships of angles, polygons and solids?</li> </ul>
	<i>Acquisition</i>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● the requirements for three segments to form a triangle.</li> <li>● there are 180 degrees in every triangle.</li> <li>● the classifications of triangles for both sides and angles: acute, obtuse, right, scalene, isosceles, equilateral</li> <li>● Facts about supplementary, complementary, vertical, and adjacent angles</li> <li>● Angle pair relationships: adjacent, vertical, complementary, supplementary, linear pair</li> <li>● conditions needed to construct a unique triangle, more than one triangle, or no triangle.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● creating triangles given specific sides and/or angles.</li> <li>● finding missing angles in a triangle.</li> <li>● classifying a triangle by both its sides and its angles.</li> <li>● Identifying values of angles in complementary and supplementary relationships</li> <li>● Using vertical, complementary, and supplementary angle relationships to find missing angles</li> <li>● Solving for unknown angles using equations</li> </ul>	

<i>Used in Content Area Standards</i>	<i>21<sup>st</sup> Century Skills</i>
	<ul style="list-style-type: none"> <li>● Communication</li> <li>● Critical Thinking</li> <li>● Collaboration</li> </ul>

<b>Stage 2 - Evidence</b>	
<i>Evaluative Criteria</i>	<i>Assessment Evidence</i>
	ASSESSMENT: Written Assessments or Projects
	Other Evidence: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Accelerated Math - Grade 6

### Unit 8: Geometry & Data - Volume

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the area of Geometry. In this unit, students will continue their understanding of volume.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.6.G.2. Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas <math>V = l w h</math> and <math>V = b h</math> to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.</li> <li>● CCSS. 7.G.6 Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. CCSS.MP1 Make sense of problems and persevere in solving them.</li> <li>● CCSS.MP6 Attend to precision.</li> <li>● CCSS.MP8 Look for and express regularity in repeated reasoning.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● apply volume formulas in the context of solving real-world problems</li> <li>● explain the difference between surface area and volume of objects.</li> </ul>	
	<i>Meaning</i>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Area, surface area and volume have applications in real world situations.</li> <li>● Dimension is a measure of the width, height, or length of a figure.</li> <li>● Different 3-dimensional figures can have the same volume even if the dimensions are not all the same.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● What does volume mean?</li> <li>● How are the volumes of rectangular prism and triangular prism related?</li> <li>● What is the difference between volume and surface area?</li> </ul>
	<i>Acquisition</i>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● Polygon</li> <li>● Polyhedron</li> <li>● Edge</li> <li>● Vertex</li> <li>● Length</li> <li>● Width</li> <li>● Depth</li> <li>● Cubic Units</li> <li>● Formulas for prism: <math>V=LWH</math> or <math>V=Bh</math></li> <li>● Irregular Figures</li> <li>● Prism</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● Calculating volume using models</li> <li>● Fluently calculating volume using formulas</li> <li>● Applying the formulas for volume of three-dimensional figures</li> <li>● Differentiating between volume and the surface area to solve problem for three-dimensional figures</li> <li>● Calculating and explaining how to find the area, volume, and surface area for two- and three- dimensional objects from real-world situations</li> </ul>	

	<ul style="list-style-type: none"> <li>• volume as the space inside a solid.</li> </ul>	
<b><i>Used in Content Area Standards</i></b>		<b><i>21<sup>st</sup> Century Skills</i></b>
		<ul style="list-style-type: none"> <li>• Collaboration</li> <li>• Critical Thinking</li> <li>• Communication</li> </ul>

<b>Stage 2 - Evidence</b>	
<b><i>Evaluative Criteria</i></b>	<b><i>Assessment Evidence</i></b>
	ASSESSMENT: Written Assessments or Projects
	Other Evidence: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Accelerated Math - Grade 6

### Unit 9: Geometry & Data - Statistics & Probability

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the area of Geometry and Data. In this unit, students will continue their understanding of data analysis and statistical graphs.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.6.SP.1. Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.</li> <li>CCSS.6.SP.2. Understand that a set of data collected to answer a statistical question has a distribution, which can be described by its center, spread, and overall shape.</li> <li>● CCSS.6.SP.3. Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.</li> <li>● CCSS.6.SP.4. Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</li> <li>● CCSS.6.SP.5. Summarize numerical data sets in relation to their context, such as by:               <ul style="list-style-type: none"> <li>● CCSS.6.SP.5. a. Reporting the number observations.</li> </ul> </li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● analyze graphs found in multiple sources</li> <li>● describe data using graphs and measures of central tendency</li> </ul>	
	<i>Meaning</i>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● A statistical question anticipates variability in the data related to the question and accounts for it in the answers.</li> <li>● A set of data collected to answer a statistical question has a distribution, which can be described by its center, spread, and overall shape.</li> <li>● A measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● How are statistics used to collect, analyze, and draw conclusions in today's society?</li> <li>● Why are statistics important in the world?</li> <li>● What are the ways that data can be represented visually?</li> <li>● Why is it better to use different graphs and diagrams to understand data?</li> <li>● What are the different ways in which we can summarize data sets?</li> </ul>
	<i>Acquisition</i>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● line plots, histograms, bar graphs, and scatter plots as visual representations of data.</li> <li>● measures of central tendency: mean, median, and the mode.</li> <li>● data can be misleading</li> <li>● statistical questioning</li> <li>● Sampling</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● Determining measures of central tendency and variation</li> <li>● Choosing which measure of central tendency is appropriate for a given set of points</li> <li>● Analyzing data from a given dot plot, histogram, and box plots</li> <li>● Reporting observations about data using</li> </ul>	

<ul style="list-style-type: none"> <li>● CCSS.6.SP.5. b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</li> <li>● CCSS.6.SP.5. c. Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.</li> <li>● CCSS.6.SP.5. d. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.</li> </ul> <p>CCSS.MP2 Reason abstractly and quantitatively.</p> <ul style="list-style-type: none"> <li>● CCSS.MP4 Model with mathematics.</li> <li>● CCSS.MP5 Use appropriate tools strategically.</li> <li>● CCSS.MP6 Attend to precision</li> </ul>	<ul style="list-style-type: none"> <li>● Frequency</li> <li>● Distribution</li> <li>● Symmetric</li> <li>● Outliers</li> <li>● balance point</li> <li>● measures of variation: range, quartile, interquartile range (IQR), absolute deviation, mean absolute deviation</li> <li>● Box-and-whisker plot</li> </ul>	<p>mathematical vocabulary</p> <ul style="list-style-type: none"> <li>● Summarize and describe distributions using both measures of central tendency as well as variation data</li> <li>● Make predictions from graphs</li> </ul>
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
		<ul style="list-style-type: none"> <li>● Communication</li> <li>● Critical Thinking</li> <li>● Technology Literacy</li> </ul>

## Stage 2 - Evidence

<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	ASSESSMENT: Written Assessments or Projects
	Other Evidence: independent practice, classroom observations and discussions

Title of Curriculum: 7th Grade Math Curriculum

Unit Name	What (content, vocab)	Why (enduring understandings)	How (skills)
<b>Unit 1: Ratio and Proportional Relationships</b>	<ul style="list-style-type: none"> <li>● Ratio, rate, unit rate</li> <li>● Equivalent ratios</li> <li>● Proportional relationship</li> <li>● Percent Proportion and Equation</li> <li>● Constant rate of change</li> <li>● Complex fractions</li> <li>● Markups, discounts, sales tax, commission, simple interest</li> </ul>	<ul style="list-style-type: none"> <li>● A proportion is an equality of ratios.</li> <li>● Proportional relationships guide many aspects of life: nature, drawings, and financial scenarios.</li> <li>● The connections between percents, decimals, and fractions are critical to help order, analyze, construct, and make predictions in everyday real-world and mathematical situations.</li> </ul>	<ul style="list-style-type: none"> <li>● Calculate complex unit rates</li> <li>● Solve percent equations using proportions</li> <li>● Calculate discount or sale price of an item</li> <li>● Calculate sales tax</li> <li>● Solve percent word problems including percent change and percent error</li> <li>● Express proportions in tables and graphs</li> <li>● Express a proportional relationship in an equation</li> <li>● Graph proportional relationship</li> <li>● Interpret a point on a graph in context</li> </ul>
<b>Unit 2: The Number System</b>	<ul style="list-style-type: none"> <li>● Absolute value</li> <li>● Zero pairs</li> <li>● Additive inverse</li> <li>● Operations with integers</li> <li>● Order of Operations</li> <li>● Rational Numbers</li> <li>● Terminating and repeating decimals</li> </ul>	<ul style="list-style-type: none"> <li>● The properties of operations for whole numbers hold true for rational numbers.</li> <li>● Rational numbers are all numbers that can be written as a fraction including natural numbers, whole numbers and integers.</li> </ul>	<ul style="list-style-type: none"> <li>● Order and compare rational numbers</li> <li>● Model addition and subtraction of signed numbers on a number line</li> <li>● Add, subtract, multiply, and divide with integers</li> <li>● Add, subtract, multiply and divide with rational numbers</li> <li>● Use the order of operations with rational numbers</li> <li>● Evaluate algebraic expressions with integer values</li> <li>● Convert common fractions to decimals without a calculator</li> <li>● Solve real world problems involving rational numbers</li> </ul>
<b>Unit 3: Expressions and Equations</b>	<ul style="list-style-type: none"> <li>● Distributive Property</li> <li>● Algebraic Properties</li> <li>● Inequalities</li> </ul>	<ul style="list-style-type: none"> <li>● Real world situations can be represented symbolically</li> </ul>	<ul style="list-style-type: none"> <li>● Simplify algebraic expressions with rational numbers</li> </ul>

	<ul style="list-style-type: none"> <li>• Variables, constants, and coefficients</li> <li>• Like terms</li> <li>• Equivalent expressions and equations</li> </ul>	<p>with expressions and equations.</p> <ul style="list-style-type: none"> <li>• An equation is formed by two equivalent expressions.</li> <li>• Equivalent equations represent the same value in unique forms.</li> </ul>	<ul style="list-style-type: none"> <li>• Create algebraic expressions from verbal expressions</li> <li>• Define a variable and create an equation from a word problem</li> <li>• Create and solve one-step equations with integers by balancing the equation</li> <li>• Solve two-step equations by using equivalent equations</li> <li>• Create and solve one- and two- step inequalities</li> <li>• Graph inequalities on a number line</li> <li>• Rewrite expressions in different forms</li> <li>• Solve problems with fractional coefficients</li> <li>• Check for reasonableness of solutions</li> <li>• Finding the Greatest Common Factor for monomials</li> <li>• Factor linear expressions using the distributive property</li> </ul>
<b>Geometry - Circle/Scale</b>	<ul style="list-style-type: none"> <li>• Circumference and area</li> <li>• Composite figures</li> <li>• Scale drawings</li> <li>• Scale factor</li> </ul>	<ul style="list-style-type: none"> <li>• Scale drawings are proportional to one another by a measure called the scale factor.</li> <li>• Proportional relationships can be used to draw geometric figures at differing scales.</li> <li>• A circle is a closed shape that is defined by the set of points that are the same distance from the center of the circle.</li> </ul>	<ul style="list-style-type: none"> <li>• Calculate circumference and area of circles</li> <li>• Draw similar figures using scale factor</li> <li>• Find missing lengths given similar figures</li> <li>• Explain the change in area and volume when applying scale factor</li> </ul>
<b>Geometry – Angles and Triangles</b>	<ul style="list-style-type: none"> <li>• Properties of triangles</li> <li>• Classification of triangles: acute, obtuse, right</li> </ul>	<ul style="list-style-type: none"> <li>• Drawings and constructions help to see the relationships and differences between geometrical figures.</li> </ul>	<ul style="list-style-type: none"> <li>• Create triangles given specific sides and/or angles</li> <li>• Determine the missing angles in triangles</li> <li>• Classify triangles by their sides and angles</li> </ul>

		<ul style="list-style-type: none"> <li>Analyzing geometric relationships develops reasoning and justification skills.</li> <li>Angle relationships can be used to determine missing angle measures in diagrams.</li> </ul>	<ul style="list-style-type: none"> <li>determine the missing angles in polygons.</li> <li>break polygons into triangles and computing the sum of interior angles.</li> <li>classify angle pair relationships.</li> <li>create algebraic equations using angle pair relationships.</li> </ul>
<b>Statistics</b>	<ul style="list-style-type: none"> <li>Measures of Central Tendency</li> <li>Dispersion of data</li> <li>Variation</li> <li>Sampling Techniques</li> <li>Bias</li> <li>Valid and Invalid inferences</li> <li>Comparing data sets</li> </ul>	<ul style="list-style-type: none"> <li>A statistical question anticipates variability in the data related to the question and accounts for it in the answers.</li> <li>A set of data collected to answer a statistical question has a distribution, which can be described by its center, spread, and overall shape.</li> </ul>	<ul style="list-style-type: none"> <li>Create data with specific mode, median, and mean</li> <li>Identify when a measure of center is not an accurate reflection of data</li> <li>Use data from a random sample to draw inferences about a population</li> <li>Analyze data to make predictions</li> <li>Display two samples of data on a box plot to illustrate variability</li> <li>Create a line plot to compare two samples</li> </ul>
<b>Probability</b>	<ul style="list-style-type: none"> <li>Probability is between and includes 0 and 1</li> <li>Experimental probability</li> <li>Theoretical Probability</li> <li>Tree diagrams</li> <li>Dependent and independent events</li> <li>Compound probability</li> <li>possible and favorable outcomes</li> </ul>	<ul style="list-style-type: none"> <li>Probability is used to predict the likelihood of an event and make decisions.</li> <li>Key to valuable experimental probability is good data.</li> </ul>	<ul style="list-style-type: none"> <li>Perform an activity, record results and calculate experimental probability.</li> <li>Compare different experimental probabilities for the same activity and explain the differences.</li> <li>Compare and explain experimental versus theoretical probability.</li> <li>Make predictions based on probability.</li> <li>Create tree diagrams to find total possible outcomes.</li> <li>Express probability as fractions and percents.</li> <li>Identify an event that would have a probability of zero and one.</li> <li>Calculate compound probability of both dependent and independent events.</li> </ul>

# Windham School District Curriculum

## Mathematics - Grade 7

### Unit 1: Ratio & Proportional Relationships

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the area of algebra. In this unit, students will gain a deeper understanding of ratio and proportional relationships and apply to real world applications.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.7.RP.1. Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.</li> <li>● CCSS.7.RP.2. Recognize and represent proportional relationships between quantities.</li> <li>● CCSS.7.RP.3. Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.</li> <li>● CCSS.MP1 Make sense of problems and persevere in solving them.</li> <li>● CCSS.MP2 Reason abstractly and quantitatively.</li> <li>● CCSS.MP6 Attend to precision.</li> <li>● CCSS.MP7 Look for and make use of structure.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● solve real-world problem using proportional relationships and percent relationships</li> <li>● connect proportional relationships to linear relationships</li> <li>● apply proportional reasoning to solve problems involving scale factor</li> </ul>	
	<i>Meaning</i>	
	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● A proportion is an equality of ratios.</li> <li>● Proportional relationships guide many aspects of life: nature, drawings, and financial scenarios.</li> <li>● The connections between percents, decimals, and fractions are critical to help order, analyze, construct, and make predictions in everyday real-world and mathematical situations.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● What is the better deal?</li> <li>● How can proportions be used to solve a variety of problems?</li> </ul>
<i>Acquisition</i>		
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● unit rate is the rate of change based on one.</li> <li>● a proportion is two ratios that are equivalent.</li> <li>● a complex fraction is a comparison of decimals or fractions and may be expressed as a simple fraction.</li> <li>● constant of proportionality is the rate of change.</li> <li>● the graph of a proportional relationship is a straight line that goes through the origin.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● calculating complex unit rates.</li> <li>● solving a percent equation using proportions.</li> <li>● calculating the discount and the sale price of an item.</li> <li>● calculating sales tax.</li> <li>● solving percent word problems involving percent change and percent error.</li> <li>● expressing proportions in tables and graphs.</li> </ul>	

<ul style="list-style-type: none"> <li>● CCSS.MP8 Look for and express regularity in repeated reasoning.</li> </ul>	<ul style="list-style-type: none"> <li>● the concept of interest.</li> <li>● commission is money earned based on sales.</li> <li>● markups, markdowns, and sales tax are related to sales.</li> </ul>	<ul style="list-style-type: none"> <li>● expressing a proportional relationship in an equation.</li> <li>● graphing proportional relationships.</li> <li>● interpreting a point in the graph in the context of a word problem.</li> </ul>
<b><i>Used in Content Area Standards</i></b>		<b><i>21<sup>st</sup> Century Skills</i></b>
		<ul style="list-style-type: none"> <li>● Critical Thinking</li> <li>● Communication</li> </ul>

## Stage 2 - Evidence

<b><i>Evaluative Criteria</i></b>	<b><i>Assessment Evidence</i></b>
	ASSESSMENT: Written Assessments or Projects
	Other Evidence: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 7

### Unit 2: The Number System

Stage 1 Desired Results		
<p><b>ESTABLISHED GOALS:</b> Students will continue their study of mathematics in the area of numbers and operations. In this unit, students will gain a deeper understanding of the number system, and will operate with rational numbers.</p> <p><b>Content Standards:</b></p> <ul style="list-style-type: none"> <li>● CCSS.7.NS.1. Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.</li> <li>● CCSS.7.NS.2. Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.</li> <li>● CCSS.7.NS.3. Solve real-world and mathematical problems involving the four operations with rational numbers.</li> <li>● CCSS.MP1 Make sense of problems and persevere in solving them.</li> <li>● CCSS.MP2 Reason abstractly and quantitatively.</li> <li>● CCSS.MP4 Model with mathematics.</li> </ul>	<b>Transfer</b>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● recognize rational numbers, especially signed numbers, as they relate to real world scenarios</li> <li>● fluently add, subtract, multiply and divide rational numbers.</li> <li>● solve equations and inequalities with rational numbers.</li> </ul>	
	<b>Meaning</b>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● The properties of operations for whole numbers hold true for rational numbers.</li> <li>● Rational numbers are all numbers that can be written as a fraction including natural numbers, whole numbers and integers.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● How are integers related to science, social studies and language arts?</li> <li>● How do you represent rational numbers?</li> </ul>
<b>Acquisition</b>		
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● additive inverses as zero pairs.</li> <li>● addition and subtraction are inverse operations where subtraction is adding the inverse.</li> <li>● rules for addition, subtraction, multiplication and division of integers.</li> <li>● zero cannot be a divisor.</li> <li>● a fraction must be equivalent to either a terminating or a repeating decimal.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● ordering and comparing rational numbers.</li> <li>● modeling addition and subtraction of signed numbers on a number line.</li> <li>● Adding, subtracting, multiplying, and dividing integers.</li> <li>● adding, subtracting, multiplying and dividing rational numbers.</li> <li>● using the order of operations with rational numbers.</li> <li>● evaluating algebraic expressions with integers values.</li> </ul>	

		<ul style="list-style-type: none"> <li>• converting common fractions to decimals without a calculator.</li> <li>• solving real world problems involving rational numbers.</li> </ul>
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
		<ul style="list-style-type: none"> <li>• Critical Thinking</li> <li>• Problem solving</li> <li>• Communication</li> </ul>

### Stage 2 - Evidence

<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	ASSESSMENT: Written Assessments or Projects
	Other Evidence: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 7

### Unit 3: Expressions & Equations

Stage 1 Desired Results		
<p><b>ESTABLISHED GOALS:</b> Students will continue their study of mathematics in the area of algebra. In this unit, students will gain a deeper understanding of solving real-world problems involving expressions and equations.</p> <p><b>Content Standards:</b></p> <ul style="list-style-type: none"> <li>● CCSS.7.EE.1. Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.</li> <li>● CCSS.7.EE.2. Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related.</li> <li>● CCSS.7.EE.3. Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.</li> <li>● CCSS.7.EE.4. Use variables to represent quantities in a real-world or mathematical problem, and</li> </ul>	<b>Transfer</b>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● represent scenarios using expressions and equations.</li> <li>● use equations as a method to solve real-world problems.</li> </ul>	
	<b>Meaning</b>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Real world situations can be represented symbolically with expressions and equations.</li> <li>● An equation is formed by two equivalent expressions.</li> <li>● Equivalent equations represent the same value in unique forms.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● How do you compare algebraic solutions to arithmetic solutions?</li> <li>● How do you translate real world problems to algebraic expressions?</li> <li>● Does my answer make sense?</li> </ul>
<b>Acquisition</b>		
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● the difference between a constant and a coefficient, including coefficients of one.</li> <li>● like terms are terms with the same variable.</li> <li>● equivalent expressions have the same value.</li> <li>● an algebraic equation may have a solution.</li> <li>● an inequality states two values are not the same.</li> <li>● commutative, associative, identity, distributive, and inverse properties.</li> <li>● a monomial is a single term.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● simplifying algebraic expressions with rational numbers.</li> <li>● creating algebraic expressions from verbal expressions.</li> <li>● defining a variable and creating an equation from a word problem.</li> <li>● creating and solving one-step equations with integers by balancing the equation.</li> <li>● solving two-step equations by using equivalent equations.</li> <li>● graphing inequalities on a number line.</li> </ul>	

<p>construct simple equations and inequalities to solve problems by reasoning about the quantities.</p> <ul style="list-style-type: none"> <li>● CCSS.MP1 Make sense of problems and persevere in solving them.</li> <li>● CCSS.MP3 Construct viable arguments and critique the reasoning of others.</li> <li>● CCSS.MP7 Look for and make use of structure.</li> </ul>		<ul style="list-style-type: none"> <li>● creating and solving one and two-step inequalities.</li> <li>● rewriting expressions in a different form; example <math>\frac{1}{2}</math> of <math>x = .5x = x/2</math></li> <li>● solving problems with fractional coefficients.</li> <li>● checking for the reasonableness of the solution.</li> <li>● finding the Greatest Common Factor for monomials.</li> <li>● factoring linear expressions using distributive property.</li> </ul>
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
		<ul style="list-style-type: none"> <li>● Critical Thinking</li> <li>● Collaboration</li> <li>● Communication</li> </ul>

### Stage 2 - Evidence

<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	ASSESSMENT: Written Assessments or Projects
	Other Evidence: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 7

### Unit 4: Geometry - Circles/Scale

Stage 1 Desired Results				
<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the area of geometry. In this unit, students will gain a deeper understanding of finding area and circumference of a circle, as well as using scale to produce new figures.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.7.G.A.1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.</li> <li>● CCSS.7.G.B.4 Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.</li> <li>● CCSS.MP1 Make sense of problems and persevere in solving them.</li> <li>● CCSS.MP2 Reason abstractly and quantitatively.</li> <li>● CCSS.MP5 Use appropriate tools strategically.</li> <li>● CCSS.MP6 Attend to precision.</li> </ul>	<i>Transfer</i>			
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● apply areas and circumferences of circles when finding surface area and volume as well as solving real-life problems.</li> <li>● apply proportional reasoning to solve problems involving scale factor</li> </ul>			
	<i>Meaning</i>			
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; padding: 5px;">ENDURING UNDERSTANDINGS</th> <th style="text-align: left; padding: 5px;">ESSENTIAL QUESTIONS</th> </tr> </thead> <tbody> <tr> <td style="vertical-align: top; padding: 5px;"> <ul style="list-style-type: none"> <li>● Scale drawings are proportional to one another by a measure called the scale factor.</li> <li>● Proportional relationships can be used to draw geometric figures at differing scales.</li> <li>● A circle is a closed shape that is defined by the set of points that are the same distance from the center of the circle.</li> </ul> </td> <td style="vertical-align: top; padding: 5px;"> <ul style="list-style-type: none"> <li>● How can we determine area, given circumference?</li> <li>● Can we determine diameter or radius, given area or circumference?</li> <li>● What kinds of problems can you solve using circumference and area formulas?</li> <li>● How can you use proportions to investigate real-world and mathematical objects at different scales?</li> </ul> </td> </tr> </tbody> </table>	ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS	<ul style="list-style-type: none"> <li>● Scale drawings are proportional to one another by a measure called the scale factor.</li> <li>● Proportional relationships can be used to draw geometric figures at differing scales.</li> <li>● A circle is a closed shape that is defined by the set of points that are the same distance from the center of the circle.</li> </ul>
ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS			
<ul style="list-style-type: none"> <li>● Scale drawings are proportional to one another by a measure called the scale factor.</li> <li>● Proportional relationships can be used to draw geometric figures at differing scales.</li> <li>● A circle is a closed shape that is defined by the set of points that are the same distance from the center of the circle.</li> </ul>	<ul style="list-style-type: none"> <li>● How can we determine area, given circumference?</li> <li>● Can we determine diameter or radius, given area or circumference?</li> <li>● What kinds of problems can you solve using circumference and area formulas?</li> <li>● How can you use proportions to investigate real-world and mathematical objects at different scales?</li> </ul>			
<i>Acquisition</i>				
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● circumference of a circle is the distance around the circle.</li> <li>● formula for calculating the circumference of a circle is <math>C = d\pi</math> or <math>C = 2\pi r</math> where <math>C</math> is the circumference of a circle, <math>d</math> is the length of the diameter of the circle, <math>r</math> is the length of the radius of the circle, and <math>\pi</math> is represented using the approximation 3.14.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● Calculating circumference and area of circles</li> <li>● Drawing similar figures using scale factor</li> <li>● Finding missing lengths given similar figures</li> <li>● Explaining the change in area and volume when applying scale factor</li> </ul>			

	<ul style="list-style-type: none"> <li>• formula for calculating the area of a circle is <math>A = \pi r^2</math></li> <li>• Scale drawings are representations of real objects or places that are in proportion to the real objects or places they represent.</li> <li>• scale of a drawing is the ratio drawing length : actual length</li> <li>• scale of a map is the ratio map distance : actual distance.</li> <li>• When calculating the area of a scaled figure, the scale must be applied to all dimensions of the figure.</li> </ul>	
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
•		<ul style="list-style-type: none"> <li>• Technology Literacy</li> <li>• Critical Thinking</li> <li>• Collaboration</li> </ul>

### Stage 2 - Evidence

<i>Evaluative Criteria</i>	<i>Assessment Evidence</i>
	ASSESSMENT: Written Assessments or Projects
	Other Evidence: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 7

### Unit 5: Geometry - Angles & Triangles

#### Stage 1 Desired Results

<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the area of geometry. In this unit, students will gain a deeper understanding of angles and triangles, and will solve real-world problems involving geometric figures.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.7.G.2. Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.</li> <li>● CCSS.7.G.5. Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.</li> <li>● CCSS.MP4 Model with mathematics.</li> <li>● CCSS.MP5 Use appropriate tools strategically.</li> <li>● CCSS.MP6 Attend to precision.</li> </ul>	<b>Transfer</b>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● use angles and triangles to solve real-world problems involving geometric figures.</li> <li>● use vocabulary and properties in future studies of Geometry.</li> </ul>	
	<b>Meaning</b>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Drawings and constructions help to see the relationships and differences between geometrical figures.</li> <li>● Analyzing geometric relationships develops reasoning and justification skills.</li> <li>● Angle relationships can be used to determine missing angle measures in diagrams.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● How do geometric models describe spatial relationships?</li> <li>● What are the major classifications and relationships of angles and triangles?</li> </ul>
	<b>Acquisition</b>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● the requirements for three segments to form a triangle.</li> <li>● there are 180 degrees in every triangle.</li> <li>● the classifications of triangles for both sides and angles.</li> <li>● the characteristics of a regular polygon.</li> <li>● the different angle pair relationships: adjacent, vertical, complementary, supplementary, and linear pair.</li> <li>● congruent angles are angles with the same measure.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● creating triangles given specific sides and/or angles.</li> <li>● finding missing angles in a triangle.</li> <li>● classifying a triangle by both its sides and its angles.</li> <li>● determining the missing angles in polygons.</li> <li>● breaking polygons into triangles and computing the sum of interior angles.</li> <li>● classifying angle pair relationships.</li> <li>● creating algebraic equations using angle pair relationships.</li> </ul>	

<i>Used in Content Area Standards</i>	<i>21<sup>st</sup> Century Skills</i>
	<ul style="list-style-type: none"> <li>• Critical Thinking</li> <li>• Communication</li> </ul>

### **Stage 2 - Evidence**

<i>Evaluative Criteria</i>	<i>Assessment Evidence</i>
	ASSESSMENT: Written Assessments or Projects
	Other Evidence: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 7

### Unit 6: Statistics

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the area of data and problem solving. In this unit, students will gain a deeper understanding of statistics, by analyzing and interpreting data from real-world problems.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.7.SP.1 Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.</li> <li>● CCSS.7.SP.2. Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.</li> <li>● CCSS.7.SP.3. Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● analyze and interpret data from real-world situations.</li> </ul>	
	<i>Meaning</i>	
	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● A statistical question anticipates variability in the data related to the question and accounts for it in the answers.</li> <li>● A set of data collected to answer a statistical question has a distribution, which can be described by its center, spread, and overall shape.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● How do you interpret data from statistical representations?</li> </ul>
	<i>Acquisition</i>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● characteristics of each measure of central tendency.</li> <li>● dispersion of data is the way it is spread out.</li> <li>● the less variation a set has, the closer the numbers are to each other.</li> <li>● random sampling gives unbiased data.</li> <li>● a valid inference is a prediction based on a random sample.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● creating data with a specific mode, median and mean.</li> <li>● identifying when a measure of central tendency would not be an accurate reflection of the data.</li> <li>● using data from a random sample to draw inferences about a population.</li> <li>● analyzing data to make a prediction.</li> <li>● displaying two samples of data in a box plot to illustrate variability.</li> <li>● creating a line plot to compare two samples.</li> </ul>	

<p>between the centers by expressing it as a multiple of a measure of variability.</p> <ul style="list-style-type: none"> <li>● CCSS.7.SP.4. Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations.</li> <li>● CCSS.MP3 Construct viable arguments and critique the reasoning of others.</li> <li>● CCSS.MP4 Model with mathematics.</li> <li>● CCSS.MP5 Use appropriate tools strategically.</li> </ul>		
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
		<ul style="list-style-type: none"> <li>● Communication</li> <li>● Critical Thinking</li> </ul>

### Stage 2 - Evidence

<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	ASSESSMENT: Written Assessments or Projects
	Other Evidence: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 7

### Unit 7: Probability

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the area of data and problem solving. In this unit, students will gain a deeper understanding of probability to solve real-world problems involving chance.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.7.SP.C.5 Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.</li> <li>● CCSS.7.SP.C.6 Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.</li> <li>● CCSS.7.SP.C.7 Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● solve real-world problems involving chance.</li> <li>● make good choices by using their knowledge of the probability of events</li> </ul>	
	<i>Meaning</i>	
	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● Probability is used to predict the likelihood of an event and make decisions.</li> <li>● Key to valuable experimental probability is good data.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● What makes a game fair?</li> <li>● How are probabilities used to make everyday decisions?</li> </ul>
	<i>Acquisition</i>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● probability is the likelihood that something will happen.</li> <li>● experimental probability is based on someone's results.</li> <li>● theoretical probability is based on what exists.</li> <li>● possible outcomes and favorable outcomes.</li> <li>● equally likely outcomes are results that have the same probability of happening.</li> <li>● tree diagrams as a method for finding all possible outcomes.</li> <li>● probability of an outcome ranges between 0 (never happening) and 1 (always happening).</li> <li>● compound probability is used when more than one event is happening.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● performing an activity, recording results and calculating experimental probability.</li> <li>● comparing different experimental probabilities for the same activity and explaining the difference.</li> <li>● comparing and explaining experimental versus theoretical probability.</li> <li>● making predictions based on probability.</li> <li>● creating tree diagrams to find total possible outcomes.</li> <li>● expressing probability as fractions and percents.</li> <li>● identifying an event that would have a probability of zero.</li> </ul>	

<ul style="list-style-type: none"> <li>● CCSS.7.SP.C.8 Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.</li> <li>● CCSS.MP2 Reason abstractly and quantitatively.</li> <li>● CCSS.MP4 Model with mathematics.</li> </ul>	<ul style="list-style-type: none"> <li>● probability is either independent or dependent.</li> </ul>	<ul style="list-style-type: none"> <li>● identifying an event that would have a probability of one.</li> <li>● calculating compound probability of both dependent and independent events.</li> </ul>
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
		<ul style="list-style-type: none"> <li>● Communication</li> <li>● Critical Thinking</li> </ul>

### Stage 2 - Evidence

<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	ASSESSMENT: Written Assessments or Projects
	Other Evidence: independent practice, classroom observations and discussions

Title of Curriculum: 7th Grade Accelerated Math

Unit Name	What (content, vocab)	Why (enduring understandings)	How (skills)
<b>Unit 1: Ratio and Proportional Relationships</b>	<ul style="list-style-type: none"> <li>● Ratio, rate, unit rate</li> <li>● Equivalent ratios</li> <li>● Proportional relationship</li> <li>● Percent Proportion and Equation</li> <li>● Constant rate of change</li> <li>● Complex fractions</li> <li>● Markups, discounts, sales tax, commission, simple interest</li> </ul>	<ul style="list-style-type: none"> <li>● A proportion is an equality of ratios.</li> <li>● Proportional relationships guide many aspects of life: nature, drawings, and financial scenarios.</li> <li>● The connection between percents, decimals, and fractions is essential to help order, analyze, construct, and make predictions in everyday real-world and mathematical situations.</li> </ul>	<ul style="list-style-type: none"> <li>● Calculate complex unit rates</li> <li>● Solve a percent equation</li> <li>● Calculate discount or sale price of an item</li> <li>● Calculate sales tax</li> <li>● Solve percent word problems including percent change and percent error</li> <li>● Express proportions in tables and graphs</li> <li>● Express a proportional relationship in an equation</li> <li>● Interpret a point on a graph in context</li> </ul>
<b>Unit 2: The Number System</b>	<ul style="list-style-type: none"> <li>● Absolute value</li> <li>● Zero pairs</li> <li>● Additive inverse</li> <li>● Operations with integers</li> <li>● Order of Operations</li> <li>● Rational Numbers</li> <li>● terminating and repeating decimals</li> </ul>	<ul style="list-style-type: none"> <li>● The properties of operations for whole numbers hold true for rational numbers.</li> <li>● Rational numbers are all numbers that can be written as a fraction including natural numbers, whole numbers and integers.</li> </ul>	<ul style="list-style-type: none"> <li>● Order and compare rational numbers</li> <li>● Determine if a number is rational or irrational</li> <li>● Model addition and subtraction of signed numbers on a number line</li> <li>● Add, subtract, multiply and divide with rational numbers</li> <li>● Use the order of operations with rational numbers</li> <li>● Evaluate algebraic expressions with integer values</li> <li>● Convert common fractions to decimals without a calculator</li> <li>● Solve real world problems involving rational numbers</li> <li>● Find square roots of perfect squares and cube roots of perfect cubes</li> </ul>

			<ul style="list-style-type: none"> <li>Estimate, to the nearest whole number, non-perfect square roots</li> </ul>
<b>Unit 3: Expressions and Equations</b>	<ul style="list-style-type: none"> <li>Distributive Property</li> <li>Monomials</li> <li>Binomials</li> <li>Algebraic Properties</li> <li>Inequalities</li> <li>Variables, constants, and coefficients</li> <li>Like terms</li> <li>Equivalent expressions and equations</li> </ul>	<ul style="list-style-type: none"> <li>Real world situations can be represented symbolically with expressions and equations.</li> <li>An equation is formed by two equivalent expressions.</li> <li>Equivalent equations represent the same value in unique forms.</li> </ul>	<ul style="list-style-type: none"> <li>Simplify algebraic expressions with rational numbers</li> <li>Create algebraic expressions from verbal expressions</li> <li>Define a variable and create an equation from a word problem</li> <li>Solve one-step equations with integers by balancing the equation</li> <li>Solve two-step equations by using equivalent equations</li> <li>Create and solve one- and two- step inequalities</li> <li>Rewrite expressions in different forms</li> <li>Solve problems with fractional coefficients</li> <li>Check for reasonableness of solutions</li> <li>Find GCF for monomials</li> <li>Factor linear expressions using the distributive property</li> </ul>
<b>Unit 4: Transformations</b>	<ul style="list-style-type: none"> <li>Transformations</li> <li>Congruence</li> <li>Similarity</li> </ul>	<ul style="list-style-type: none"> <li>Congruent objects can be transformed on top of each other.</li> <li>Similar objects are a combination of rigid motions and dilation.</li> </ul>	<ul style="list-style-type: none"> <li>Transform polygons using dilations, translations, reflections, and rotations.</li> <li>Identify coordinates of transformed figures.</li> <li>Describe sequence of transformations that result in congruent or similar figures.</li> </ul>
<b>Unit 5: Angles and Transversals</b>	<ul style="list-style-type: none"> <li>Triangle angle relationships</li> <li>Angles formed by parallel lines cut by a transversal</li> <li>Interior, exterior, and corresponding angles</li> </ul>	<ul style="list-style-type: none"> <li>Analyzing geometric relationships develops reasoning and justification skills.</li> <li>Angle relationships can be used to determine missing angle measures in diagrams.</li> </ul>	<ul style="list-style-type: none"> <li>classify angle pair relationships.</li> <li>create algebraic equations using angle pair relationships.</li> <li>find angle measurements using properties of similar figures, exterior</li> </ul>

			and interior angles, and parallel lines cut by a transversal.
<b>Unit 6: Pythagorean Theorem</b>	<ul style="list-style-type: none"> <li>Pythagorean Theorem</li> <li>Right Triangles</li> <li>Area of squares</li> <li>Radicals</li> </ul>	<ul style="list-style-type: none"> <li>Right triangles have a special relationship among the side lengths which can be represented by a model and a formula.</li> </ul>	<ul style="list-style-type: none"> <li>Informally prove the Pythagorean Theorem</li> <li>Determine if a triangle is a right triangle using its converse.</li> <li>Apply the Pythagorean Theorem to find missing triangle side lengths.</li> <li>Apply the Pythagorean Theorem to solve problems</li> </ul>
<b>Unit 7: Geometry - Volume</b>	<ul style="list-style-type: none"> <li>Cylinder</li> <li>Cones</li> <li>Spheres</li> </ul>	<ul style="list-style-type: none"> <li>Everyday objects have a variety of attributes, each of which can be measured in many ways.</li> <li>Area, surface area and volume have applications in real world situations.</li> <li>Different 3-dimensional figures can have the same volume even if the dimensions are not all the same.</li> </ul>	<ul style="list-style-type: none"> <li>Calculate volumes of cones, cylinders, and spheres using appropriate formulas and units.</li> <li>Use volume formulas to solve real world problems.</li> </ul>
<b>Unit 8: Statistics</b>	<ul style="list-style-type: none"> <li>Measures of Central Tendency</li> <li>Dispersion of data</li> <li>Variation</li> <li>Sampling Techniques</li> <li>Bias</li> <li>Valid and Invalid inferences</li> <li>Comparing data sets</li> </ul>	<ul style="list-style-type: none"> <li>A statistical question anticipates variability in the data related to the question and accounts for it in the answers.</li> <li>A set of data collected to answer a statistical question has a distribution, which can be described by its center, spread, and overall shape.</li> </ul>	<ul style="list-style-type: none"> <li>Create data with specific mode, median, and mean</li> <li>Identify when a measure of center is not an accurate reflection of data</li> <li>Use data from a random sample to draw inferences about a population.</li> <li>Analyze data to make predictions</li> <li>Display two samples of data on a box plot to illustrate variability</li> <li>Create a line plot to compare two samples</li> </ul>
<b>Unit 9: Probability</b>	<ul style="list-style-type: none"> <li>Probability is between and includes 0 and 1</li> <li>Experimental probability</li> </ul>	<ul style="list-style-type: none"> <li>Probability is used to predict the likelihood of an event and make decisions.</li> </ul>	<ul style="list-style-type: none"> <li>Perform an activity, record results and calculate experimental probability.</li> </ul>

	<ul style="list-style-type: none"> <li>● Theoretical Probability</li> <li>● Tree diagrams</li> <li>● Dependent and independent events</li> <li>● Compound probability</li> <li>● possible and favorable outcomes</li> </ul>	<ul style="list-style-type: none"> <li>● Key to valuable experimental probability is good data.</li> </ul>	<ul style="list-style-type: none"> <li>● Compare different experimental probabilities for the same activity and explain the differences.</li> <li>● Make predictions based on probability.</li> <li>● Create tree diagrams to find total possible outcomes.</li> <li>● Express probability as fractions and percents.</li> <li>● Identify an event that would have a probability of zero and one.</li> <li>● Calculate compound probability of both dependent and independent events.</li> </ul>
--	---	--	--

# Windham School District Curriculum

## Accelerated Mathematics - Grade 7

### Unit 1: Ratio & Proportional Relationships

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the area of algebra. In this unit, students will gain a deeper understanding of ratio and proportional relationships and apply these concepts to real world applications.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.7.RP.1. Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.</li> <li>● CCSS.7.RP.2. Recognize and represent proportional relationships between quantities.</li> <li>● CCSS.7.RP.3. Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.</li> <li>● CCSS.MP1 Make sense of problems and persevere in solving them.</li> <li>● CCSS.MP2 Reason abstractly and quantitatively.</li> <li>● CCSS.MP6 Attend to precision.</li> <li>● CCSS.MP7 Look for and make use of structure.</li> <li>● CCSS.MP8 Look for and express regularity in repeated reasoning.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● solve real-world problem using proportional relationships and percent relationships</li> <li>● connect proportional relationships to linear relationships</li> <li>● apply proportional reasoning to solve problems involving scale factor</li> </ul>	
	<i>Meaning</i>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● A proportion is an equality of ratios.</li> <li>● Proportional relationships guide many aspects of life: nature, drawings, and financial scenarios.</li> <li>● The connection between percents, decimals, and fractions is critical to help order, analyze, construct, and make predictions in everyday real-world and mathematical situations.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● What is the better deal?</li> <li>● How can proportions be used to solve a variety of problems?</li> </ul>
<i>Acquisition</i>		
	<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● unit rate is the rate of change based on one.</li> <li>● a proportion is two ratios that are equivalent.</li> <li>● a complex fraction is a comparison of decimals or fractions and may be expressed as a simple fraction.</li> <li>● constant of proportionality is the rate of change.</li> <li>● linear equation will graph as a line due to constant rate of change.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● calculating complex unit rates.</li> <li>● solving a percent equation using proportions.</li> <li>● calculating the discount and the sale price of an item.</li> <li>● calculating sales tax.</li> <li>● solving percent word problems involving percent change and percent error.</li> <li>● expressing proportions in tables and graphs.</li> </ul>

	<ul style="list-style-type: none"> <li>● graph of a proportional relationship is a straight line that goes through the origin.</li> <li>● percent is the ratio of the percent to one hundred.</li> <li>● Interest as both extra return and extra payment</li> <li>● commission is money earned based on sales.</li> <li>● markups, markdowns, and sales tax are related to sales.</li> </ul>	<ul style="list-style-type: none"> <li>● expressing a proportional relationship in an equation.</li> <li>● intercepting a point in the graph in the context of a word problem.</li> </ul>
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
		<ul style="list-style-type: none"> <li>● Critical Thinking</li> <li>● Communication</li> </ul>

## Stage 2 - Evidence

<i>Evaluative Criteria</i>	<i>Assessment Evidence</i>
	ASSESSMENT: Written Assessments or Projects
	Other Evidence: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Accelerated Mathematics - Grade 7

### Unit 2: The Number System

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the area of numbers and operations. In this unit, students will gain a deeper understanding of the number system and will calculate with rational numbers.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.7.NS.1. Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.</li> <li>● CCSS.7.NS.2. Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.</li> <li>● CCSS.7.NS.3. Solve real-world and mathematical problems involving the four operations with rational numbers.</li> <li>● CCSS.MP1 Make sense of problems and persevere in solving them.</li> <li>● CCSS.MP2 Reason abstractly and quantitatively.</li> <li>● CCSS.MP4 Model with mathematics.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● fluently add, subtract, multiply and divide rational numbers.</li> <li>● solve equations and inequalities with rational numbers.</li> </ul>	
	<i>Meaning</i>	
	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● The properties of operations for whole numbers hold true for rational numbers.</li> <li>● Rational numbers are all numbers that can be written as a fraction including natural numbers, whole numbers and integers.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● How are integers related to science, social studies and language arts?</li> <li>● How do you represent rational numbers?</li> </ul>
	<i>Acquisition</i>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● additive inverses as zero pairs.</li> <li>● that addition and subtraction are inverse operations and that subtraction problems can be changed to addition problems by adding the inverse.</li> <li>● adding the additive inverse.</li> <li>● the rules for addition, subtraction, multiplication and division of integers.</li> <li>● exponents, square roots, and cube roots.</li> <li>● that zero cannot be a divisor.</li> <li>● that a fraction must be equivalent to either a terminating or a repeating decimal.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● ordering and comparing rational numbers.</li> <li>● determining if a number is rational or irrational.</li> <li>● modeling addition and subtraction of signed numbers on a number line.</li> <li>● adding, subtracting, multiplying and dividing rational numbers.</li> <li>● using the order of operations with rational numbers.</li> <li>● evaluating algebraic expressions with integers values.</li> <li>● converting common fractions to decimals without a calculator.</li> </ul>	

	<ul style="list-style-type: none"> <li>the difference between a rational and irrational number.</li> </ul>	<ul style="list-style-type: none"> <li>Solve real-world problems involving rational numbers.</li> <li>finding square roots of perfect squares and cube roots of perfect cubes.</li> <li>interpreting sums of rational numbers in a real-world context.</li> <li>solving real world problems involving rational numbers.</li> </ul>
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
		<ul style="list-style-type: none"> <li>Critical Thinking</li> <li>Perseverance</li> <li>Communication</li> </ul>

### Stage 2 - Evidence

<i>Evaluative Criteria</i>	<i>Assessment Evidence</i>
	ASSESSMENT: Written Assessments or Projects
	Other Evidence: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Accelerated Mathematics - Grade 7

### Unit 3: Expressions & Equations

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the area of algebra. In this unit, students will gain a deeper understanding of solving real-world problems involving expressions and equations.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.7.EE.1. Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.</li> <li>● CCSS.7.EE.2. Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related.</li> <li>● CCSS.7.EE.3. Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.</li> <li>● CCSS.7.EE.4. Use variables to represent quantities in a real-world or mathematical problem, and</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● solve real-world problems using numerical and algebraic expressions and equations.</li> <li>● use linear equations to solve more advanced mathematical equations</li> </ul>	
	<i>Meaning</i>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Real world situations can be represented symbolically with expressions and equations.</li> <li>● An equation is formed by two equivalent expressions.</li> <li>● Equivalent equations represent the same value in unique forms.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● How do you compare algebraic solutions to arithmetic solutions?</li> <li>● How do you translate real world problems to algebraic expressions?</li> <li>● Does my answer make sense?</li> </ul>
	<i>Acquisition</i>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● difference between a constant and a coefficient, including coefficients of one.</li> <li>● like terms are terms with the same variable.</li> <li>● equivalent expressions have the same value.</li> <li>● an algebraic equation may have a solution.</li> <li>● an inequality states two values are not the same.</li> <li>● commutative, associative, identity, distributive, and inverse properties.</li> <li>● a monomial is a single term.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● simplifying algebraic expressions with rational numbers.</li> <li>● creating algebraic expressions from verbal expressions.</li> <li>● defining a variable and creating an equation from a word problem.</li> <li>● solving one-step equations with integers by balancing the equation.</li> <li>● solving two-step equations by using equivalent equations.</li> <li>● solving equations with variables on both sides of the equation.</li> </ul>	

<p>construct simple equations and inequalities to solve problems by reasoning about the quantities.</p> <ul style="list-style-type: none"> <li>● CCSS.MP1 Make sense of problems and persevere in solving them.</li> <li>● CCSS.MP3 Construct viable arguments and critique the reasoning of others.</li> <li>● CCSS.MP7 Look for and make use of structure.</li> </ul>		<ul style="list-style-type: none"> <li>● graphing inequalities on a number line.</li> <li>● creating and solving one-step inequalities.</li> <li>● creating and solving two-step inequalities.</li> <li>● rewriting expressions in a different form; example <math>\frac{1}{2}</math> of <math>x = .5x = x/2</math></li> <li>● solving problems with fractional coefficients.</li> <li>● checking for the reasonableness of the solution.</li> <li>● finding the Greatest Common Factor for monomials.</li> <li>● factoring linear expressions using distributive property.</li> </ul>
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
		<ul style="list-style-type: none"> <li>● Critical Thinking</li> <li>● Communication</li> </ul>

<b>Stage 2 - Evidence</b>	
<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	ASSESSMENT: Written Assessments or Projects
	Other Evidence: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Accelerated Mathematics - Grade 7

### Unit 4: Geometry - Transformations

#### Stage 1 Desired Results

<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the area of geometry. In this unit, students will gain a deeper understanding of transformations, and will be able to determine whether a transformation creates a congruent or similar figure.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.8.G.1. Verify experimentally the properties of rotations, reflections, and translations.</li> <li>● CCSS.8.G.2. Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.</li> <li>● CCSS.8.G.3. Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.</li> <li>● CCSS.8.G.4. Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.</li> <li>● CCSS.MP1 Make sense of problems and persevere in solving them.</li> <li>● CCSS.MP6 Attend to precision</li> <li>● CCSS.MP7 Look for and make use of structure.</li> </ul>	<b>Transfer</b>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● translate, reflect, rotate and dilate figures on a coordinate plane.</li> <li>● determine whether the new figure is congruent or similar to the original figure.</li> </ul>	
	<b>Meaning</b>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Congruent objects can be transformed on top of each other.</li> <li>● Similar objects are a combination of rigid motions and dilation.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● What movements preserve or change shapes?</li> </ul>
	<b>Acquisition</b>	
	<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● Transformations: dilations, translations, reflections, and rotations</li> <li>● transformations preserve congruence of polygons, lines, and angle measurements.</li> <li>● dilations create similar figures.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● transforming polygons using dilations, translations, reflections, and rotations.</li> <li>● identifying coordinates of transformed figures.</li> <li>● describing a sequence of transformations that result in congruent or similar figures.</li> </ul>

<i>Used in Content Area Standards</i>	<i>21<sup>st</sup> Century Skills</i>
	<ul style="list-style-type: none"> <li>• Technology Literacy</li> <li>• Critical thinking</li> </ul>

### **Stage 2 - Evidence**

<i>Evaluative Criteria</i>	<i>Assessment Evidence</i>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Accelerated Mathematics - Grade 7

### Unit 5: Geometry - Angles & Transversals

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the area of geometry. In this unit, students will gain a deeper understanding of angles, angle relationships, and transversals and will solve real-world problems involving geometric figures.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.7.G.5. Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.</li> <li>● CCSS.8.G.1 Verify experimentally the properties of rotations, reflections, and translations.</li> <li>● CCSS.8.G.2 Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.</li> <li>● CCSS.8.G.3 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.</li> <li>● CCSS.8.G.4 Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures,</li> </ul>	<b>Transfer</b>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● use angles and triangles to solve real-world problems involving geometric figures.</li> <li>● use vocabulary and properties in future studies of Geometry.</li> </ul>	
	<b>Meaning</b>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Analyzing geometric relationships develops reasoning and justification skills.</li> <li>● Angle relationships can be used to determine missing angle measures in diagrams.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● Who needs to use angles and how do they use them?</li> <li>● What special relationships exist between angles and lines?</li> <li>● How many pairs of congruent angles are created when two parallel lines are cut by a transversal?</li> </ul>
<b>Acquisition</b>		
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● different angle pair relationships: adjacent, vertical, complementary, supplementary, and linear pair.</li> <li>● congruent angles are angles with the same measure.</li> <li>● intersecting lines are lines with one point in common.</li> <li>● angle relationships between exterior and interior triangle angles, similar triangles, and parallel lines cut by a transversal.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● classifying angle pair relationships.</li> <li>● creating algebraic equations using angle pair relationships.</li> <li>● finding angle measurements using properties of similar figures, exterior and interior angles, and parallel lines cut by a transversal.</li> </ul>	

<p>describe a sequence that exhibits the similarity between them.</p> <ul style="list-style-type: none"> <li>● CCSS.8.G.5 Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.</li> <li>● CCSS.MP4 Model with mathematics.</li> <li>● CCSS.MP5 Use appropriate tools strategically.</li> <li>● CCSS.MP6 Attend to precision.</li> </ul>		
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
		<ul style="list-style-type: none"> <li>● Technology Literacy</li> </ul>

### Stage 2 - Evidence

<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Accelerated Mathematics - Grade 7

### Unit 6: Geometry - The Pythagorean Theorem

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the area of geometry. In this unit, students will gain a deeper understanding of the pythagorean theorem and its converse.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.8.G.6. Explain a proof of the Pythagorean Theorem and its converse.</li> <li>● CCSS.8.G.7. Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.</li> <li>● CCSS8.G.8. Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.</li> <li>● CCSS.MP.2 Reason abstractly and quantitatively.</li> <li>● CCSS.MP.4 Model with mathematics.</li> <li>● CCSS.MP.6 Attend to precision.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● apply pythagorean theorem to future geometric concepts</li> <li>● use pythagorean theorem and its converse to solve real-world problems.</li> </ul>	
	<i>Meaning</i>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Right triangles have a special relationship among the side lengths which can be represented by a model and a formula.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● How can right triangle relationships model real world phenomena?</li> <li>● How can you use the Pythagorean Theorem to solve everyday problems?</li> </ul>
	<i>Acquisition</i>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● Pythagorean Theorem equates the sum of the squares of the legs to the square of the hypotenuse.</li> <li>● converse of the Pythagorean Theorem can be used to determine whether a given triangle is a right triangle.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● Informally proving the Pythagorean Theorem (<math>a^2 + b^2 = c^2</math>)</li> <li>● Determining if a triangle is a right triangle using its converse.</li> <li>● Applying the Pythagorean Theorem to find missing triangle side lengths.</li> <li>● Applying the Pythagorean Theorem to solve problems</li> </ul>	
<i>Used in Content Area Standards</i>	<i>21<sup>st</sup> Century Skills</i>	
	<ul style="list-style-type: none"> <li>● Technology Literacy</li> <li>● Critical Thinking</li> </ul>	

## Stage 2 - Evidence

<i>Evaluative Criteria</i>	<i>Assessment Evidence</i>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Accelerated Mathematics - Grade 7

### Unit 7: Geometry: Volume

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the area of geometry. In this unit, students will gain a deeper understanding of the volume of three-dimensional figures; such as cylinders, cones and spheres.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.8.G.9. Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.</li> <li>● CCSS.MP1 Make sense of problems and persevere in solving them.</li> <li>● CCSS.MP4 Model with mathematics.</li> <li>● CCSS.MP6 Attend to precision</li> <li>● CCSS.MP8 Look for and express regularity in repeated reasoning.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● solve real-world problems including the volume of cylinders, cones and spheres.</li> </ul>	
	<i>Meaning</i>	
	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● Everyday objects have a variety of attributes, each of which can be measured in many ways.</li> <li>● Area, surface area and volume have applications in real world situations.</li> <li>● Different 3-dimensional figures can have the same volume even if the dimensions are not all the same.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● Will the size of a container indicate its contents?</li> <li>● How will the volume change if one dimension is changed?</li> <li>● How does understanding two-dimensional figures help find the volume of three-dimensional figures?</li> </ul>
	<i>Acquisition</i>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● volume of some solid figures is calculated using the area of the base and its height.</li> <li>● connection between finding volume of one base vs. two base figures.</li> <li>● formulas for finding volume of cones, cylinders, and spheres.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● calculating volume of cones, cylinders, and spheres using appropriate formulas and units.</li> <li>● using volume formulas to solve real-world problems.</li> </ul>	
<i>Used in Content Area Standards</i>		<i>21<sup>st</sup> Century Skills</i>
		<ul style="list-style-type: none"> <li>● Technology Literacy</li> <li>● Critical Thinking</li> </ul>

## Stage 2 - Evidence

<i>Evaluative Criteria</i>	<i>Assessment Evidence</i>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Accelerated Mathematics - Grade 7

### Unit 8: Statistics

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the area of data and problem solving. In this unit, students will gain a deeper understanding of statistics, by analyzing and interpreting data from real-world problems.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.7.SP.1 Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.</li> <li>● CCSS.7.SP.2. Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.</li> <li>● CCSS.7.SP.3. Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● analyze and interpret data from real-world situations.</li> <li>● understand when real-life data is misleading</li> </ul>	
	<i>Meaning</i>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● A statistical question anticipates variability in the data related to the question and accounts for it in the answers.</li> <li>● A set of data collected to answer a statistical question has a distribution, which can be described by its center, spread, and overall shape.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● How do you interpret data from statistical representations?</li> </ul>
<i>Acquisition</i>		
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● measure of central tendency: mean, median, mode</li> <li>● dispersion of data is the spread of data</li> <li>● the less variation a set has the closer the numbers are to each other.</li> <li>● random sampling gives unbiased data.</li> <li>● a valid inference is a prediction based on a random sample.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● creating data with a specific mode, median and mean.</li> <li>● identifying when a measure of central tendency would not be an accurate reflection of the data.</li> <li>● using data from a random sample to draw inferences about a population.</li> <li>● analyzing data to make a prediction.</li> <li>● displaying two samples of data in a box plot to illustrate variability.</li> </ul>	

<ul style="list-style-type: none"> <li>● CCSS.7.SP.4. Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations.</li> <li>● CCSS.MP3 Construct viable arguments and critique the reasoning of others.</li> <li>● CCSS.MP4 Model with mathematics.</li> <li>● CCSS.MP5 Use appropriate tools strategically.</li> </ul>		<ul style="list-style-type: none"> <li>● creating a line plot to compare two samples.</li> </ul>
<b><i>Used in Content Area Standards</i></b>		<b><i>21<sup>st</sup> Century Skills</i></b>
		<ul style="list-style-type: none"> <li>● Communication</li> <li>● Critical Thinking</li> </ul>

### Stage 2 - Evidence

<b><i>Evaluative Criteria</i></b>	<b><i>Assessment Evidence</i></b>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Accelerated Mathematics - Grade 7

### Unit 9: Probability

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the area of data and problem solving. In this unit, students will gain a deeper understanding of probability to solve real-world problems involving chance.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>CCSS.7.SP.C.5 Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.</li> <li>CCSS.7.SP.C.6 Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.</li> <li>CCSS.7.SP.C.7 Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>solve real-world problems involving chance.</li> </ul>	
	<i>Meaning</i>	
	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>Probability is used to predict the likelihood of an event and make decisions.</li> <li>Key to valuable experimental probability is good data.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>What makes a game fair?</li> <li>How are probabilities used to make everyday decisions?</li> </ul>
	<i>Acquisition</i>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>probability is the likelihood that something will happen.</li> <li>experimental probability is based on someone's results.</li> <li>theoretical probability is based on what exists.</li> <li>possible outcomes and favorable outcomes.</li> <li>equally likely outcomes are results that have the same probability of happening.</li> <li>tree diagrams as a method for finding all possible outcomes.</li> <li>probability of an outcome ranges between 0 (never happening) and 1 (always happening).</li> <li>compound probability is used when more than one event is happening.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>performing an activity, recording results and calculating experimental probability.</li> <li>comparing different experimental probabilities for the same activity and explaining the difference.</li> <li>making predictions based on probability.</li> <li>creating tree diagrams to find total possible outcomes.</li> <li>expressing probability as fractions and percents.</li> <li>identifying an event that would have a probability of zero.</li> <li>identifying an event that would have a probability of one.</li> </ul>	

<ul style="list-style-type: none"> <li>● CCSS.7.SP.C.8 Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.</li> <li>● CCSS.MP2 Reason abstractly and quantitatively.</li> <li>● CCSS.MP4 Model with mathematics.</li> </ul>	<ul style="list-style-type: none"> <li>● probability is either independent or dependent.</li> </ul>	<ul style="list-style-type: none"> <li>● calculating compound probability of both dependent and independent events.</li> </ul>
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
		<ul style="list-style-type: none"> <li>● Communication</li> <li>● Critical Thinking</li> </ul>

### Stage 2 - Evidence

<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

Title of Curriculum: 8th Grade Math

Unit Name	What (content, vocab)	Why (enduring understandings)	How (skills)
<b>Unit 1: Numbers &amp; Operations: The Real Number System</b>	<ul style="list-style-type: none"> <li>● Rational numbers</li> <li>● Irrational numbers</li> <li>● Radicals (square and cube roots)</li> <li>● Exponents</li> <li>● Scientific notation</li> <li>● Compare real numbers</li> </ul>	<ul style="list-style-type: none"> <li>● Real numbers include rational and irrational numbers which can be approximated using rational numbers.</li> <li>● Real numbers can be represented using mathematical symbols.</li> </ul>	<ul style="list-style-type: none"> <li>● Determine whether a number is irrational or rational</li> <li>● Approximate rational numbers</li> <li>● Compare and order rational and irrational numbers</li> <li>● Find perfect square and cube roots</li> <li>● Write expressions using integer exponents</li> <li>● Investigate numbers written in scientific notation</li> </ul>
<b>Unit 2: Algebraic Thinking: Solving Equations</b>	<ul style="list-style-type: none"> <li>● Equivalent expressions</li> <li>● Equations</li> <li>● Inverse operations</li> <li>● Rational number coefficients</li> </ul>	<ul style="list-style-type: none"> <li>● Mathematical properties and inverse operations can be applied to efficiently solve equations and interpret solutions.</li> </ul>	<ul style="list-style-type: none"> <li>● Solve two-step equations, with integers using inverse operations</li> <li>● Solve multi-step equations with variables on both sides</li> <li>● Simplify expressions</li> <li>● Solve equations with rational number coefficients</li> <li>● Apply mathematics to problem solving situations</li> </ul>
<b>Unit 3: Algebraic Thinking: Linear Functions</b>	<ul style="list-style-type: none"> <li>● Linear and nonlinear functions</li> <li>● Slope</li> <li>● y-intercept</li> <li>● Proportional relationships</li> <li>● Tables, graphs, equations</li> </ul>	<ul style="list-style-type: none"> <li>● Proportional relationships can be represented as a linear equation that passes through the origin.</li> <li>● Linear relationships can be represented using tables, graphs and equations.</li> <li>● Linear functions model relationships between quantities.</li> </ul>	<ul style="list-style-type: none"> <li>● Determine if a relationship is linear or nonlinear</li> <li>● Write and interpret linear equations in slope intercept (<math>y=mx+b</math>) form</li> <li>● Analyze and translate information for linear relationships between tables, graphs and equations</li> <li>● Find and interpret the rate of change (slope, <math>m</math>) using table, graph, and equation</li> </ul>

			<ul style="list-style-type: none"> <li>● Find and interpret the initial value (y-intercept, b) using table, graph, and equation</li> <li>● Represent and compare proportional relationships from different representations</li> </ul>
<b>Unit 4: Algebraic Thinking: Linear Systems</b>	<ul style="list-style-type: none"> <li>● Graphs of Linear systems</li> <li>● Solutions (intersection point, infinite, none)</li> </ul>	<ul style="list-style-type: none"> <li>● Solutions to linear systems can be used to represent real world phenomena.</li> </ul>	<ul style="list-style-type: none"> <li>● Solve linear systems using graphing methods</li> <li>● Determine whether lines will be parallel or intersecting</li> <li>● Interpret the solution to a linear system in real world situations</li> </ul>
<b>Unit 5: Algebraic Thinking: Bivariate Data</b>	<ul style="list-style-type: none"> <li>● Scatterplots</li> <li>● Association (Correlation)</li> <li>● Best fit line</li> <li>● Qualitative graphs and descriptions</li> </ul>	<ul style="list-style-type: none"> <li>● Bivariate data can be graphed to show correlation.</li> <li>● Linear data can be modeled with an equation to answer questions and make predictions</li> <li>● Functions can model relationships between quantities.</li> </ul>	<ul style="list-style-type: none"> <li>● Construct and interpret scatter plots to investigate patterns of association between two quantities</li> <li>● Describe patterns of association for two quantities. (positive, negative, no association)</li> <li>● Create and use lines of best fit to make and evaluate predictions</li> <li>● Interpret the relationships between two variables on qualitative graphs</li> </ul>
<b>Unit 6: Geometry: Transformations</b>	<ul style="list-style-type: none"> <li>● Transformations: dilations, translations, reflections, rotations</li> <li>● Congruence</li> <li>● Similarity</li> </ul>	<ul style="list-style-type: none"> <li>● Transformations can result in congruent or similar figures.</li> </ul>	<ul style="list-style-type: none"> <li>● Transform polygons using dilations, translations, reflections, and rotations</li> <li>● Identify coordinates of transformed figures</li> <li>● Describe sequence of transformations that result in congruent or similar figures</li> </ul>
<b>Unit 7: Geometry: Angles</b>	<ul style="list-style-type: none"> <li>● Triangle angle relationships</li> <li>● Angles formed by parallel lines cut by a transversal</li> <li>● Interior and exterior angles</li> </ul>	<ul style="list-style-type: none"> <li>● Special angle relationships are formed by triangles and parallel lines cut by a transversal.</li> <li>● Angle relationships can be used to determine missing angle measures in diagrams.</li> </ul>	<ul style="list-style-type: none"> <li>● Find angle measurements using properties of similar figures, exterior and interior angles, and parallel lines cut by a transversal</li> </ul>

<b>Unit 8: Geometry: Pythagorean Theorem</b>	<ul style="list-style-type: none"> <li>● Pythagorean Theorem</li> <li>● Converse of the Pythagorean Theorem</li> <li>● Squares and square roots</li> <li>● Distance on the coordinate plane</li> </ul>	<ul style="list-style-type: none"> <li>● Right triangles have a special relationship among the side lengths which can be represented by a model and a formula.</li> </ul>	<ul style="list-style-type: none"> <li>● Informally prove the Pythagorean Theorem</li> <li>● Determine if a triangle is a right triangle using its converse</li> <li>● Apply the Pythagorean Theorem to find missing triangle side lengths</li> <li>● Apply the Pythagorean Theorem to solve problems</li> <li>● Apply the Pythagorean Theorem to find distance between two points on the coordinate plane</li> </ul>
<b>Unit 9: Geometry: Volume</b>	<ul style="list-style-type: none"> <li>● Volume and Surface area of right prisms and pyramids</li> <li>● Nets</li> <li>● Volume of Cylinder, Cones and Spheres</li> </ul>	<ul style="list-style-type: none"> <li>● Everyday objects have a variety of attributes, each of which can be measured in many ways.</li> <li>● Area, surface area and volume have applications in real world situations.</li> <li>● Different 3-dimensional figures can have the same volume even if the dimensions are not all the same.</li> </ul>	<ul style="list-style-type: none"> <li>● Calculate volume of triangular prisms and pyramids using appropriate formulas and units</li> <li>● Calculate surface area of triangular prisms and pyramids</li> <li>● Calculate volumes of cones, cylinders, and spheres using appropriate formulas and units</li> <li>● Use volume formulas to solve real world problems</li> <li>● Draw nets of solid figures</li> </ul>

# Windham School District Curriculum

## Mathematics - Grade 8

### Unit 1: Numbers & Operations - The Real Number System

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the area of the real number system. In this unit, students will gain a deeper understanding of rational and irrational numbers.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● <b>CCSS.8.NS.1.</b> Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion that repeats eventually into a rational number.</li> <li>● <b>CCSS.8.NS.2.</b> Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., <math>\pi^2</math>)</li> <li>● <b>CCSS.8.EE.1.</b> Know and apply the properties of integer exponents to generate equivalent numerical expressions.</li> <li>● <b>CCSS.8.EE.2.</b> Use square root and cube root symbols to represent solutions to equations of the form <math>x^2 = p</math> and <math>x^3 = p</math>, where <math>p</math> is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that <math>\sqrt{2}</math> is irrational.</li> <li>● <b>CCSS.8.EE.3.</b> Use numbers expressed in the form of a single digit times a whole-number power of 10 to estimate very large or very small quantities.</li> <li>● <b>CCSS.MP2</b> Reason abstractly and quantitatively.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● understand the different types of numbers within the real number systems</li> <li>● connect those understandings to numbers they see in their daily life.</li> </ul>	
	<i>Meaning</i>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Real numbers include rational and irrational numbers which can be approximated using rational numbers.</li> <li>● Real numbers can be represented using mathematical symbols.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● When are numbers exact?</li> <li>● How can mathematics make really large or really small numbers understandable?</li> </ul>
<i>Acquisition</i>		
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● real numbers are made up of rational and irrational numbers</li> <li>● different subsets of the real number system are comparable.</li> <li>● finding perfect square roots help to estimate the values of square roots that are not perfect.</li> <li>● radical symbols indicate square or cube roots.</li> <li>● equivalent expressions can be written using integer exponents.</li> <li>● very large or very small numbers can be written using scientific notation.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● determining whether a number is irrational or rational.</li> <li>● approximating irrational numbers.</li> <li>● comparing and ordering rational and irrational numbers.</li> <li>● finding perfect square and cube roots.</li> <li>● writing equivalent expressions using integer exponents.</li> <li>● investigating numbers written in scientific notation</li> </ul>	

<ul style="list-style-type: none"> <li>● CCSS.MP3 Construct viable arguments and critique the reasoning of others.</li> <li>● CCSS.MP6 Attend to precision.</li> <li>● CCSS.MP7 Look for and make use of structure.</li> <li>● CCSS.MP8 Look for and express regularity in repeated reasoning.</li> </ul>		
<b><i>Used in Content Area Standards</i></b>		<b><i>21<sup>st</sup> Century Skills</i></b>
		<ul style="list-style-type: none"> <li>● Communication</li> <li>● Technology Literacy</li> </ul>

### Stage 2 - Evidence

<b><i>Evaluative Criteria</i></b>	<b><i>Assessment Evidence</i></b>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 8

### Unit 2: Algebraic Thinking - Solving Equations

Stage 1 Desired Results																							
<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the area of algebraic thinking. In this unit, students will gain a deeper understanding of solving equations.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.8.EE.7. Solve linear equations in one variable.</li> <li>● CCSS.MP2 Reason abstractly and quantitatively.</li> <li>● CCSS.MP3 Construct viable arguments and critique the reasoning of others.</li> <li>● CCSS.MP4 Model with mathematics.</li> <li>● CCSS.MP7 Look for and make use of structure.</li> </ul>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr style="background-color: #f2f2f2;"> <th colspan="2" style="text-align: center; padding: 2px;"><i>Transfer</i></th> </tr> <tr> <td colspan="2" style="padding: 2px;"><b>Students will be able to independently use their learning to...</b></td> </tr> <tr> <td colspan="2" style="padding: 2px;"> <ul style="list-style-type: none"> <li>● understand how mathematical operations are inversely connected</li> <li>● use equations to solve real world problems.</li> </ul> </td> </tr> <tr style="background-color: #f2f2f2;"> <th colspan="2" style="text-align: center; padding: 2px;"><i>Meaning</i></th> </tr> <tr> <td style="width: 50%; padding: 2px;"> <b>ENDURING UNDERSTANDINGS</b> <ul style="list-style-type: none"> <li>● Mathematical properties and inverse operations can be applied to efficiently solve equations and interpret solutions.</li> </ul> </td> <td style="width: 50%; padding: 2px;"> <b>ESSENTIAL QUESTIONS</b> <ul style="list-style-type: none"> <li>● Are all things created equal?</li> <li>● What situations can be modeled using equations?</li> <li>● How can two equations look different but be the same?</li> </ul> </td> </tr> <tr style="background-color: #f2f2f2;"> <th colspan="2" style="text-align: center; padding: 2px;"><i>Acquisition</i></th> </tr> <tr> <td style="padding: 2px;"><i>Students will understand...</i></td> <td style="padding: 2px;"><i>Students will be skilled at...</i></td> </tr> <tr> <td style="padding: 2px;"> <ul style="list-style-type: none"> <li>● an equation involves inverse operations and maintaining balance.</li> <li>● equivalent expressions are created by properties of mathematics.</li> <li>● rational number coefficients</li> </ul> </td> <td style="padding: 2px;"> <ul style="list-style-type: none"> <li>● solving two-step equations with integers using inverse operations.</li> <li>● solving multi-step equations with variables on both sides.</li> <li>● simplifying expressions</li> <li>● solving equations with rational number coefficients.</li> <li>● applying mathematics to problem solving situations.</li> </ul> </td> </tr> <tr style="background-color: #f2f2f2;"> <th colspan="2" style="text-align: center; padding: 2px;"><i>Used in Content Area Standards</i></th> </tr> <tr style="background-color: #f2f2f2;"> <th colspan="2" style="text-align: center; padding: 2px;"><i>21<sup>st</sup> Century Skills</i></th> </tr> <tr> <td colspan="2" style="padding: 2px;"> <ul style="list-style-type: none"> <li>● Critical Thinking</li> <li>● Communication</li> </ul> </td> </tr> </table>	<i>Transfer</i>		<b>Students will be able to independently use their learning to...</b>		<ul style="list-style-type: none"> <li>● understand how mathematical operations are inversely connected</li> <li>● use equations to solve real world problems.</li> </ul>		<i>Meaning</i>		<b>ENDURING UNDERSTANDINGS</b> <ul style="list-style-type: none"> <li>● Mathematical properties and inverse operations can be applied to efficiently solve equations and interpret solutions.</li> </ul>	<b>ESSENTIAL QUESTIONS</b> <ul style="list-style-type: none"> <li>● Are all things created equal?</li> <li>● What situations can be modeled using equations?</li> <li>● How can two equations look different but be the same?</li> </ul>	<i>Acquisition</i>		<i>Students will understand...</i>	<i>Students will be skilled at...</i>	<ul style="list-style-type: none"> <li>● an equation involves inverse operations and maintaining balance.</li> <li>● equivalent expressions are created by properties of mathematics.</li> <li>● rational number coefficients</li> </ul>	<ul style="list-style-type: none"> <li>● solving two-step equations with integers using inverse operations.</li> <li>● solving multi-step equations with variables on both sides.</li> <li>● simplifying expressions</li> <li>● solving equations with rational number coefficients.</li> <li>● applying mathematics to problem solving situations.</li> </ul>	<i>Used in Content Area Standards</i>		<i>21<sup>st</sup> Century Skills</i>		<ul style="list-style-type: none"> <li>● Critical Thinking</li> <li>● Communication</li> </ul>	
<i>Transfer</i>																							
<b>Students will be able to independently use their learning to...</b>																							
<ul style="list-style-type: none"> <li>● understand how mathematical operations are inversely connected</li> <li>● use equations to solve real world problems.</li> </ul>																							
<i>Meaning</i>																							
<b>ENDURING UNDERSTANDINGS</b> <ul style="list-style-type: none"> <li>● Mathematical properties and inverse operations can be applied to efficiently solve equations and interpret solutions.</li> </ul>	<b>ESSENTIAL QUESTIONS</b> <ul style="list-style-type: none"> <li>● Are all things created equal?</li> <li>● What situations can be modeled using equations?</li> <li>● How can two equations look different but be the same?</li> </ul>																						
<i>Acquisition</i>																							
<i>Students will understand...</i>	<i>Students will be skilled at...</i>																						
<ul style="list-style-type: none"> <li>● an equation involves inverse operations and maintaining balance.</li> <li>● equivalent expressions are created by properties of mathematics.</li> <li>● rational number coefficients</li> </ul>	<ul style="list-style-type: none"> <li>● solving two-step equations with integers using inverse operations.</li> <li>● solving multi-step equations with variables on both sides.</li> <li>● simplifying expressions</li> <li>● solving equations with rational number coefficients.</li> <li>● applying mathematics to problem solving situations.</li> </ul>																						
<i>Used in Content Area Standards</i>																							
<i>21<sup>st</sup> Century Skills</i>																							
<ul style="list-style-type: none"> <li>● Critical Thinking</li> <li>● Communication</li> </ul>																							

Stage 2 - Evidence	
<i>Evaluative Criteria</i>	<i>Assessment Evidence</i>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 8

### Unit 3: Algebraic Thinking - Linear Functions

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the area of algebraic thinking. In this unit, students will gain a deeper understanding of linear relationships between two variables.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.8.EE.5. Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.</li> <li>● CCSS.8.EE.6. Use similar triangles to explain why the slope <math>m</math> is the same between any two distinct points on a nonvertical line in the coordinate plane; derive the equation <math>y = mx</math> for a line through the origin and the equation <math>y = mx + b</math> for a line intercepting the vertical axis at <math>b</math>.</li> <li>● CCSS.8.F.1. Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and corresponding output.</li> <li>● CCSS.8.F.2. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● model real world situations using graphs, tables, and equations.</li> <li>● connect linear functions to future algebraic function understandings.</li> </ul>	
	<i>Meaning</i>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Proportional relationships can be represented as a linear equation that passes through the origin.</li> <li>● Linear relationships can be represented using tables, graphs and equations.</li> <li>● Linear functions model relationships between quantities.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● How can functions represent real world phenomena?</li> <li>● When do two variables represent a linear relationship?</li> </ul>
	<i>Acquisition</i>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● linear and nonlinear functions can be shown using different representations.</li> <li>● proportional and nonproportional relationships.</li> <li>● connections between verbal descriptions and graphical representations of linear functions.</li> <li>● slope and y-intercept of linear functions.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● determining if a relationship is linear or nonlinear.</li> <li>● writing and interpreting linear equations in slope intercept (<math>y = mx + b</math>) form.</li> <li>● analyzing and translating information for linear relationships between tables, graphs and equations.</li> <li>● finding and interpreting the rate of change (slope, <math>m</math>) using tables, graphs, and equations.</li> </ul>	

<ul style="list-style-type: none"> <li>● CCSS.8.F.3. Interpret the equation <math>y = mx + b</math> as a defining a linear function, whose graph is a straight line; give examples of functions that are not linear.</li> <li>● CCSS.8.F.4. Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two <math>(x, y)</math> values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.</li> <li>● CCSS.MP1 Make sense of problems and persevere in solving them.</li> <li>● CCSS.MP3 Construct viable arguments and critique the reasoning of others.</li> <li>● CCSS.MP4 Model with mathematics.</li> <li>● CCSS.MP5 Use appropriate tools strategically.</li> <li>● CCSS.MP7 Look for and make use of structure.</li> <li>● CCSS.MP8 Look for and express regularity in repeated reasoning</li> </ul>		<ul style="list-style-type: none"> <li>● finding and interpreting the initial value (y-intercept, <math>b</math>) using tables, graphs, and equations.</li> <li>● representing and comparing proportional relationships from different representations.</li> </ul>
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
		<ul style="list-style-type: none"> <li>● Technology Literacy</li> <li>● Critical Thinking</li> </ul>

### Stage 2 - Evidence

<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	ASSESSMENT: Written Assessments or Projects
	Other Evidence: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 8

### Unit: Algebraic Thinking - Linear Systems

Stage 1 Desired Results			
<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the area of algebraic thinking. In this unit, students will gain a deeper understanding of the relationships between different linear scenarios.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.8.EE.8. Analyze and solve pairs of simultaneous linear equations.</li> <li>● CCSS.MP1 Make sense of problems and persevere in solving them.</li> <li>● CCSS.MP4 Model with mathematics.</li> <li>● CCSS.MP5 Use appropriate tools strategically</li> </ul>	<i>Transfer</i>		
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● model multiple linear relationships and interpret their intersection point.</li> </ul>		
	<i>Meaning</i>		
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● Solutions to linear systems can be used to represent real world phenomena.</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● What can happen when you have two lines?</li> <li>● How does the intersection of a linear system model real world phenomena?</li> </ul> </td> </tr> </table>	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● Solutions to linear systems can be used to represent real world phenomena.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● What can happen when you have two lines?</li> <li>● How does the intersection of a linear system model real world phenomena?</li> </ul>
	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● Solutions to linear systems can be used to represent real world phenomena.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● What can happen when you have two lines?</li> <li>● How does the intersection of a linear system model real world phenomena?</li> </ul>	
<i>Acquisition</i>			
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● lines may or may not intersect.</li> <li>● graphs of Linear systems</li> <li>● solutions (intersection point, infinite, none)</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● solving linear systems using graphing methods.</li> <li>● determining whether lines will be parallel or intersecting.</li> <li>● interpreting the solution to a linear system in real world situations.</li> </ul> </td> </tr> </table>	<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● lines may or may not intersect.</li> <li>● graphs of Linear systems</li> <li>● solutions (intersection point, infinite, none)</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● solving linear systems using graphing methods.</li> <li>● determining whether lines will be parallel or intersecting.</li> <li>● interpreting the solution to a linear system in real world situations.</li> </ul>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● lines may or may not intersect.</li> <li>● graphs of Linear systems</li> <li>● solutions (intersection point, infinite, none)</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● solving linear systems using graphing methods.</li> <li>● determining whether lines will be parallel or intersecting.</li> <li>● interpreting the solution to a linear system in real world situations.</li> </ul>		
<i>Used in Content Area Standards</i>	<i>21<sup>st</sup> Century Skills</i>		
	<ul style="list-style-type: none"> <li>● Technology Literacy</li> <li>● Critical thinking</li> </ul>		

Stage 2 - Evidence	
<i>Evaluative Criteria</i>	<i>Assessment Evidence</i>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 8

### Unit 5: Algebraic Thinking - Bivariate Data

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the area of algebraic thinking. In this unit, students will gain a deeper understanding of how data can be represented using scatterplots.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.8.SP.1. Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association. CCSS.8.SP.2. Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.</li> <li>● CCSS.8.SP.3. Use the equation of a linear model to solve problems in the context of bivariate measurement of data, interpreting the slope and interpret.</li> <li>● CCSS.8.SP.4. Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● interpret and model data using scatterplots.</li> </ul>	
	<i>Meaning</i>	
	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● Bivariate data can be graphed to show correlation.</li> <li>● Linear data can be modeled with an equation to answer questions and make predictions</li> <li>● Functions can model relationships between quantities.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● How can mathematics be used to model and make predictions for real world phenomena?</li> </ul>
	<i>Acquisition</i>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● scatter plots show relationships between two variables.</li> <li>● some data can be modeled using a linear equation.</li> <li>● linear models can be used to make predictions about data.</li> <li>● qualitative graphs tell a story.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● constructing and interpreting scatter plots to investigate patterns of association between two quantities.</li> <li>● describing patterns of association for two quantities.</li> <li>● creating and using lines of best fit to make and evaluate predictions.</li> <li>● interpreting the relationships between two variables on qualitative graphs</li> </ul>	

<ul style="list-style-type: none"> <li>● CCSS.MP 3 Construct viable arguments and critique the reasoning of others.</li> <li>● CCSS.MP 4 Model with mathematics.</li> </ul>		
<b><i>Used in Content Area Standards</i></b>		<b><i>21<sup>st</sup> Century Skills</i></b>
		<ul style="list-style-type: none"> <li>● Communication</li> <li>● Technology Literacy</li> </ul>

<b>Stage 2 - Evidence</b>	
<b><i>Evaluative Criteria</i></b>	<b><i>Assessment Evidence</i></b>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 8

### Unit 6: Geometry - Transformations

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the area of geometry. In this unit, students will gain a deeper understanding of congruence and similarity on the coordinate plane.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.8.G.1. Verify experimentally the properties of rotations, reflections, and translations.</li> <li>● CCSS.8.G.2. Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.</li> <li>● CCSS.8.G.3. Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.</li> <li>● CCSS.8.G.4. Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them</li> <li>● CCSS.MP1 Make sense of problems and persevere in solving them.</li> <li>● CCSS.MP6 Attend to precision</li> <li>● CCSS.MP7 Look for and make use of structure.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● determine if figures are congruent or similar using the coordinate plane.</li> </ul>	
	<i>Meaning</i>	
	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● Transformations can result in congruent or similar figures.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● What movements preserve or change shapes?</li> <li>● How can a house fit on a piece of paper?</li> </ul>
	<i>Acquisition</i>	
<p><i>Students will know...</i></p> <ul style="list-style-type: none"> <li>● transformations as dilations, translations, reflections, and rotations</li> <li>● transformations preserve congruence of polygons, lines, and angle measurements.</li> <li>● dilations create similar figures.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● transforming polygons using dilations, translations, reflections, and rotations.</li> <li>● identifying coordinates of transformed figures.</li> <li>● describing sequences of transformations that result in congruent or similar figures.</li> </ul>	
<b><i>Used in Content Area Standards</i></b>	<b><i>21<sup>st</sup> Century Skills</i></b>	
	<ul style="list-style-type: none"> <li>● Critical Thinking</li> </ul>	

## Stage 2 - Evidence

*Evaluative Criteria*

*Assessment Evidence*

ASSESSMENT: Written Assessments or Projects

OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 8

### Unit 7: Geometry - Angles

Stage 1 Desired Results															
<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the area of geometry. In this unit, students will gain a deeper understanding of angle relationships.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.8.G.5. Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.</li> <li>● CCSS.MP1 Make sense of problems and persevere in solving them.</li> <li>● CCSS.MP6 Attend to precision</li> <li>● CCSS.MP7 Look for and make use of structure.</li> </ul>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr style="background-color: #e0e0e0;"> <th colspan="2" style="text-align: center; padding: 2px;"><i>Transfer</i></th> </tr> <tr> <td colspan="2" style="padding: 2px;"><b>Students will be able to independently use their learning to...</b></td> </tr> <tr> <td colspan="2" style="padding: 2px;"> <ul style="list-style-type: none"> <li>● use angle relationships in more advanced study of Geometry.</li> <li>● use the relationships between angles and lines to solve real life problems.</li> </ul> </td> </tr> <tr style="background-color: #e0e0e0;"> <th colspan="2" style="text-align: center; padding: 2px;"><i>Meaning</i></th> </tr> <tr> <td style="width: 50%; padding: 2px;"> <p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● Special angle relationships are formed by triangles and parallel lines cut by a transversal.</li> <li>● Angle relationships can be used to determine missing angle measures in diagrams.</li> </ul> </td> <td style="width: 50%; padding: 2px;"> <p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● How do intersecting lines create angle relationships?</li> </ul> </td> </tr> <tr style="background-color: #e0e0e0;"> <th colspan="2" style="text-align: center; padding: 2px;"><i>Acquisition</i></th> </tr> <tr> <td style="padding: 2px;"> <p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● angle relationships between exterior and interior triangle angles, similar triangles, and parallel lines cut by a transversal.</li> </ul> </td> <td style="padding: 2px;"> <p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● finding angle measurements using properties of similar figures, exterior angles, interior angles, and parallel lines cut by a transversal.</li> </ul> </td> </tr> </table>	<i>Transfer</i>		<b>Students will be able to independently use their learning to...</b>		<ul style="list-style-type: none"> <li>● use angle relationships in more advanced study of Geometry.</li> <li>● use the relationships between angles and lines to solve real life problems.</li> </ul>		<i>Meaning</i>		<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● Special angle relationships are formed by triangles and parallel lines cut by a transversal.</li> <li>● Angle relationships can be used to determine missing angle measures in diagrams.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● How do intersecting lines create angle relationships?</li> </ul>	<i>Acquisition</i>		<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● angle relationships between exterior and interior triangle angles, similar triangles, and parallel lines cut by a transversal.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● finding angle measurements using properties of similar figures, exterior angles, interior angles, and parallel lines cut by a transversal.</li> </ul>
<i>Transfer</i>															
<b>Students will be able to independently use their learning to...</b>															
<ul style="list-style-type: none"> <li>● use angle relationships in more advanced study of Geometry.</li> <li>● use the relationships between angles and lines to solve real life problems.</li> </ul>															
<i>Meaning</i>															
<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● Special angle relationships are formed by triangles and parallel lines cut by a transversal.</li> <li>● Angle relationships can be used to determine missing angle measures in diagrams.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● How do intersecting lines create angle relationships?</li> </ul>														
<i>Acquisition</i>															
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● angle relationships between exterior and interior triangle angles, similar triangles, and parallel lines cut by a transversal.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● finding angle measurements using properties of similar figures, exterior angles, interior angles, and parallel lines cut by a transversal.</li> </ul>														
<b><i>Used in Content Area Standards</i></b>	<b><i>21<sup>st</sup> Century Skills</i></b>														
	<ul style="list-style-type: none"> <li>● Critical thinking</li> <li>● Communication</li> </ul>														

Stage 2 - Evidence	
<i>Evaluative Criteria</i>	<i>Assessment Evidence</i>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 8

### Unit 8: Geometry - Pythagorean Theorem

Stage 1 Desired Results			
<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the area of geometry . In this unit, students will gain a deeper understanding of problem solving using the Pythagorean Theorem.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.8.G.6. Explain a proof of the Pythagorean Theorem and its converse.</li> <li>● CCSS.8.G.7. Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.</li> <li>● CCSS.8.G.8. Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.</li> <li>● CCSS.MP2 Reason abstractly and quantitatively.</li> <li>● CCSS.MP4 Model with mathematics.</li> <li>● CCSS.MP6 Attend to precision.</li> </ul>	<i>Transfer</i>		
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● apply pythagorean theorem to future geometric concepts</li> <li>● use pythagorean theorem and its converse to solve real-world problems.</li> </ul>		
	<i>Meaning</i>		
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● Right triangles have a special relationship among the side lengths which can be represented by a model and a formula.</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● How can right triangle relationships model real world phenomena?</li> <li>● How can you use the Pythagorean Theorem to solve everyday problems?</li> </ul> </td> </tr> </table>	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● Right triangles have a special relationship among the side lengths which can be represented by a model and a formula.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● How can right triangle relationships model real world phenomena?</li> <li>● How can you use the Pythagorean Theorem to solve everyday problems?</li> </ul>
	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● Right triangles have a special relationship among the side lengths which can be represented by a model and a formula.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● How can right triangle relationships model real world phenomena?</li> <li>● How can you use the Pythagorean Theorem to solve everyday problems?</li> </ul>	
<i>Acquisition</i>			
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● Pythagorean Theorem equates the sum of the squares of the legs to the square of the hypotenuse in right triangles.</li> <li>● converse of the Pythagorean Theorem can be used to determine whether a given triangle is a right triangle.</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● informally proving the Pythagorean Theorem (<math>a^2 + b^2 = c^2</math>).</li> <li>● determining if a triangle is a right triangle using its converse.</li> <li>● applying the Pythagorean Theorem to find missing triangle side lengths.</li> <li>● applying the Pythagorean Theorem to solve problems.</li> <li>● applying the Pythagorean Theorem to find distance between two points on the coordinate plane.</li> </ul> </td> </tr> </table>	<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● Pythagorean Theorem equates the sum of the squares of the legs to the square of the hypotenuse in right triangles.</li> <li>● converse of the Pythagorean Theorem can be used to determine whether a given triangle is a right triangle.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● informally proving the Pythagorean Theorem (<math>a^2 + b^2 = c^2</math>).</li> <li>● determining if a triangle is a right triangle using its converse.</li> <li>● applying the Pythagorean Theorem to find missing triangle side lengths.</li> <li>● applying the Pythagorean Theorem to solve problems.</li> <li>● applying the Pythagorean Theorem to find distance between two points on the coordinate plane.</li> </ul>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● Pythagorean Theorem equates the sum of the squares of the legs to the square of the hypotenuse in right triangles.</li> <li>● converse of the Pythagorean Theorem can be used to determine whether a given triangle is a right triangle.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● informally proving the Pythagorean Theorem (<math>a^2 + b^2 = c^2</math>).</li> <li>● determining if a triangle is a right triangle using its converse.</li> <li>● applying the Pythagorean Theorem to find missing triangle side lengths.</li> <li>● applying the Pythagorean Theorem to solve problems.</li> <li>● applying the Pythagorean Theorem to find distance between two points on the coordinate plane.</li> </ul>		
<i>Used in Content Area Standards</i>	<i>21<sup>st</sup> Century Skills</i>		
	<ul style="list-style-type: none"> <li>● Critical Thinking</li> <li>● Communication</li> </ul>		

## Stage 2 - Evidence

<i>Evaluative Criteria</i>	<i>Assessment Evidence</i>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Mathematics - Grade 8

### Unit 9: Geometry - Volume

#### Stage 1 Desired Results

<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the area of geometry. In this unit, students will gain a deeper understanding of solving real world problems involving geometric solids.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.7.G.6. Solve real-world and mathematical problems involving area, volume and surface area of two- and three dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.</li> <li>● CCSS.8.G.9. Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.</li> <li>● CCSS.MP1 Make sense of problems and persevere in solving them.</li> <li>● CCSS.MP4 Model with mathematics.</li> <li>● CCSS.MP6 Attend to precision</li> <li>● CCSS.MP8 Look for and express regularity in repeated reasoning.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● solve real world problems involving volume and surface area.</li> </ul>	
	<i>Meaning</i>	
	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● Everyday objects have a variety of attributes, each of which can be measured in many ways.</li> <li>● Area, surface area and volume have applications in real world situations.</li> <li>● Different 3-dimensional figures can have the same volume even if the dimensions are not all the same.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● Will the size of a container indicate its contents?</li> <li>● How will the volume change if one dimension is changed?</li> <li>● How does understanding two-dimensional figures help find the volume of three-dimensional figures?</li> </ul>
	<i>Acquisition</i>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● volume of some solid figures is calculated using the area of the base and its height.</li> <li>● connection between finding volume of one base vs. two base figures.</li> <li>● formulas for finding volume of cones, cylinders, and spheres.</li> <li>● a net is a two-dimensional drawing of a three-dimensional figure.</li> <li>● characteristics of right prisms and pyramids.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● calculating volume of triangular prisms and pyramids using appropriate formulas and units.</li> <li>● calculating surface area of triangular prisms and pyramids.</li> <li>● calculating volumes of cones, cylinders, and spheres using appropriate formulas and units</li> <li>● using volume formulas to solve real world problems.</li> <li>● drawing nets of solid figures.</li> </ul>	

	<ul style="list-style-type: none"> <li>• surface area is the sum of the areas of the faces and bases in a three dimensional figure.</li> </ul>	
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
		<ul style="list-style-type: none"> <li>• Critical Thinking</li> <li>• Communication</li> </ul>

### Stage 2 - Evidence

<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

Title of Curriculum: 8th grade Algebra 1

Unit Name	What (content, vocab)	Why (enduring understandings)	How (skills)
<b>Unit 1: Algebraic Expressions and Functions:</b> <b>Foundations of Functions and Expressions</b>	<ul style="list-style-type: none"> <li>● Functions</li> <li>● Representations of relations</li> <li>● Function notation</li> <li>● Translations between verbal and algebraic expressions</li> <li>● Mathematical properties</li> <li>● Order of operations</li> <li>● Domain and range of functions</li> </ul>	<ul style="list-style-type: none"> <li>● Relations and functions can represent real world phenomena</li> <li>● Variables represent unknown numbers or values that can change</li> </ul>	<ul style="list-style-type: none"> <li>● Translate between verbal and algebraic expressions</li> <li>● Perform order of operations</li> <li>● Determine whether a relation is a function</li> <li>● Evaluate a function in function notation</li> <li>● Apply mathematical properties to simplify expressions</li> <li>● Recognize and evaluate functions</li> <li>● Identify and use the algebraic properties</li> <li>● Write function rules from tables and word problems</li> <li>● Determine domain and range of various functions</li> </ul>
<b>Unit 2: Algebraic Expressions and Functions:</b> <b>Exponential Expressions and Functions</b>	<ul style="list-style-type: none"> <li>● Properties of exponents</li> <li>● Scientific notation</li> <li>● Geometry applications</li> <li>● Exponential Functions</li> </ul>	<ul style="list-style-type: none"> <li>● Very large and small numbers can be represented efficiently using scientific notation</li> <li>● Exponent properties can be proven through expansion</li> <li>● Exponential functions model real world phenomena.</li> </ul>	<ul style="list-style-type: none"> <li>● Use the rules of exponents to simplify monomials</li> <li>● Apply geometric formulas to problems involving monomials</li> <li>● Write large or small numbers in scientific notation</li> <li>● Perform operations on numbers expressed in scientific notation</li> <li>● Graph exponential functions</li> </ul>
<b>Unit 3: Algebraic Equations:</b> <b>Solving Equations and Inequalities</b>	<ul style="list-style-type: none"> <li>● Literal and algebraic equations</li> <li>● Absolute value</li> <li>● Percents</li> <li>● Proportions</li> <li>● Inequalities</li> <li>● Compound inequalities</li> <li>● Absolute value inequalities</li> </ul>	<ul style="list-style-type: none"> <li>● Operations performed on one side of an equation must be performed on the other side(s) in order to preserve the equality.</li> <li>● Solutions to inequalities represent a range of values rather than a single value.</li> </ul>	<ul style="list-style-type: none"> <li>● Write and solve multi-step equations with rational coefficients</li> <li>● Write and solve multi-step one-variable inequalities, and graph them on a number line</li> <li>● Solve and graph compound inequalities</li> <li>● Graph inequalities on a number line.</li> <li>● Solve absolute value equations</li> </ul>

			<ul style="list-style-type: none"> <li>● Solve literal equations</li> <li>● Write and solve proportions, including with binomials in numerator and denominator</li> <li>● Write and Solve application percent problems</li> <li>● Solve absolute value inequalities</li> </ul>
<b>Unit 4: Functions: Linear Relationships</b>	<ul style="list-style-type: none"> <li>● Slope</li> <li>● Forms of linear equations</li> <li>● Arithmetic sequences</li> <li>● Direct variation</li> <li>● Linear representations</li> <li>● Parallel and perpendicular lines</li> <li>● Properties of horizontal and vertical lines</li> </ul>	<ul style="list-style-type: none"> <li>● Linear relationships have a constant rate of change.</li> <li>● Tables, graphs, and equations are all ways of representing functions and real world phenomena.</li> <li>● Slope can be referenced in many different ways.</li> </ul>	<ul style="list-style-type: none"> <li>● Calculate slope between two points</li> <li>● Determine the slope of a line, given an equation, table, or graph</li> <li>● Find and determine intercepts</li> <li>● Graph linear equations</li> <li>● Determine whether lines are parallel, perpendicular, or neither</li> <li>● Write linear equations in slope-intercept, standard and point-slope form</li> <li>● Create and interpret linear equations from real world data</li> <li>● Write a rule given an arithmetic sequence</li> </ul>
<b>Unit 5: Functions: Bivariate Data (Scatterplots)</b>	<ul style="list-style-type: none"> <li>● Scatterplots</li> <li>● Line of best fit</li> <li>● Correlation</li> </ul>	<ul style="list-style-type: none"> <li>● Scatter plots can model data, and be used to make predictions</li> </ul>	<ul style="list-style-type: none"> <li>● Represent bivariate data with scatterplots</li> <li>● Interpret scatterplots</li> <li>● Calculate the line of best fit</li> <li>● Use the line of best fit to find starting point represented by the y-intercept; to describe what the slope means; and to find the values at a particular point including outside the given graph</li> <li>● Determine if there is a correlation between bivariate data</li> <li>● Make predictions based on the line of best fit</li> </ul>
<b>Unit 6: Algebraic Equations: Linear Systems</b>	<ul style="list-style-type: none"> <li>● Systems of equations</li> <li>● Systems of inequalities</li> <li>● Linear inequalities</li> </ul>	<ul style="list-style-type: none"> <li>● There is more than one way to solve a system of equations and students should</li> </ul>	<ul style="list-style-type: none"> <li>● Write and solve linear systems using multiple methods</li> <li>● Distinguish if a system of equations has</li> </ul>

		<p>determine the most efficient method.</p> <ul style="list-style-type: none"> <li>Systems of equations with two unknowns can be used to solve real world problems.</li> </ul>	<p>one solution, no solution, or infinitely many solutions</p> <ul style="list-style-type: none"> <li>Graph linear inequalities on a coordinate plane</li> <li>Graph systems of linear inequalities on a coordinate plane</li> <li>Create and interpret linear inequalities</li> <li>Model real world situations with systems of equations</li> </ul>
<p><b>Unit 7: Algebraic Expressions and Equations: Polynomials and Quadratics</b></p>	<ul style="list-style-type: none"> <li>Standard form and degree</li> <li>Operations with polynomials</li> <li>Factoring polynomials</li> <li>Quadratic equations</li> <li>Geometry applications</li> </ul>	<ul style="list-style-type: none"> <li>Mathematical properties extend to simplify polynomials.</li> </ul>	<ul style="list-style-type: none"> <li>Simplify polynomial expressions</li> <li>Solve quadratic equations by factoring</li> <li>Solve geometric problems involving polynomials</li> <li>Factor quadratics (leading coefficient is 1)</li> <li>Factor polynomials</li> </ul>
<p><b>Unit 8: Algebraic Expressions and Equations: Radical Expressions and Equations</b></p>	<ul style="list-style-type: none"> <li>Operations with radicals</li> <li>Pythagorean theorem</li> <li>Representations of radicals</li> <li>Radical Equations</li> <li>Extraneous solutions</li> </ul>	<ul style="list-style-type: none"> <li>Radicals represent numbers.</li> <li>In some operations, radicals mimic variables.</li> </ul>	<ul style="list-style-type: none"> <li>Simplify radicals</li> <li>Add, subtract, multiply, and divide radicals</li> <li>Solve problems involving the Pythagorean theorem</li> <li>Solve radical equations</li> <li>Determine extraneous solutions when solving radical equations</li> </ul>

# Windham School District Curriculum

## Algebra 1 - Grade 8

### Unit 1: Algebraic Expressions & Function Foundations of Functions and Expressions

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the areas of algebraic expressions and functions. In this unit, students will gain a deeper understanding of function foundations for algebra.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.HSF.IF.A.1: Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If <math>f</math> is a function and <math>x</math> is an element of its domain, then <math>f(x)</math> denotes the output of <math>f</math> corresponding to the input <math>x</math>. The graph of <math>f</math> is the graph of the equation <math>y = f(x)</math>.</li> <li>● CCSS.HSF.IF.A.2: Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.</li> <li>● CCSS.HSF.IF.B.6: Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.</li> <li>● CCSS.HSF.IF.C.8: Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.</li> <li>● CCSS.HSF.IF.B.5: Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● connect basic knowledge of functions in the study of advanced functions.</li> </ul>	
	<i>Meaning</i>	
	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● Relations and functions can represent real world phenomena.</li> <li>● Variables represent unknown numbers or values that can change.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● How can relations and functions relate to real world problems?</li> <li>● How do you use variables, expressions, and equations to model real world problems?</li> </ul>
<i>Acquisition</i>		
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● verbal and algebraic expressions.</li> <li>● order of operations.</li> <li>● that mathematical properties simplify expressions.</li> <li>● representations of relations and graphs of relations.</li> <li>● functions and function notation.</li> <li>● the domain and range of a function.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● translating between verbal and algebraic expressions.</li> <li>● performing order of operations.</li> <li>● determining whether a relation is a function.</li> <li>● evaluating a function in function notation.</li> <li>● applying mathematical properties to simplify expressions.</li> <li>● recognizing and evaluating functions.</li> </ul>	

<ul style="list-style-type: none"> <li>● CCSS.HSF.BF.A.1: Write a function that describes a relationship between two quantities.</li> <li>● CCSS.HSA.SSE.A.1: Interpret expressions that represent a quantity in terms of its context.</li> <li>● CCSS.HSA.SSE.A.1.A: Interpret parts of an expression, such as terms, factors, and coefficients.</li> <li>● CCSS.HSA.SSE.A.2: Use the structure of an expression to identify ways to rewrite it.</li> <li>● CCSS.HSA.SSE.B.3: Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.</li> <li>● CCSS.HSF.BF.A.1.C: (+) Compose functions.</li> <li>● CCSS.MP3 Construct viable arguments and critique the reasoning of others.</li> <li>● CCSS.MP7 Look for and make use of structure.</li> </ul>		<ul style="list-style-type: none"> <li>● identifying and using the algebraic properties.</li> <li>● writing function rules from tables and word problems.</li> <li>● determining the domain and range of various functions.</li> </ul>
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
		<ul style="list-style-type: none"> <li>● Technology Literacy</li> <li>● Communication</li> </ul>

### Stage 2 - Evidence

<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Algebra 1 - Grade 8

### Unit 2: Algebraic Expressions & Functions

### Exponential Expressions & Functions

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the areas of algebraic expressions and functions. In this unit, students will gain a deeper understanding of exponential expressions and functions.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.HSA.SSE.A.2: Use the structure of an expression to identify ways to rewrite it.</li> <li>● CCSS.HSA.SSE.B.3: Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.</li> <li>● CCSS.HSA.APR.A.1: Understand that polynomials form a system analogous to the integers; namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.</li> <li>● CCSS.8A.IF.08.b: Use the properties of exponents to interpret expressions for exponential functions</li> <li>● CCSS.MP1 Make sense of problems and persevere in solving them.</li> <li>● CCSS.MP2 Reason abstractly and quantitatively.</li> <li>● CCSS.MP7 Look for and make use of structure.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● recognize the key characteristics of exponential functions and its real-life applications</li> <li>● use knowledge of exponential function in future studies of logarithmic functions</li> </ul>	
	<i>Meaning</i>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Very large and small numbers can be represented efficiently using scientific notation</li> <li>● Exponent properties can be proven through expansion.</li> <li>● Exponential functions model real world phenomena.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● What are the rules of exponents and how are they applied to simplify expressions?</li> <li>● How can exponents model real world data?</li> </ul>
	<i>Acquisition</i>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● properties of exponents can simplify monomial expressions.</li> <li>● scientific notation can be used to write really large or small numbers.</li> <li>● geometric applications of monomial expressions.</li> <li>● negative exponents have a reciprocal relationship.</li> <li>● exponential functions model real world phenomena.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● using the rules of exponents to simplify monomials.</li> <li>● applying geometric formulas to problems involving monomials.</li> <li>● writing large or small numbers in scientific notation.</li> <li>● performing operations on numbers expressed in scientific notation.</li> <li>● graphing exponential functions.</li> </ul>	

<i>Used in Content Area Standards</i>	<i>21<sup>st</sup> Century Skills</i>
	<ul style="list-style-type: none"> <li>● Critical thinking</li> <li>● Technology Literacy</li> </ul>

### Stage 2 - Evidence

<i>Evaluative Criteria</i>	<i>Assessment Evidence</i>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Algebra 1 - Grade 8

### Unit 3: Algebraic Equations

### Solving Equations & Inequalities

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the areas of algebraic equations. In this unit, students will gain a deeper understanding of solving equations and inequalities.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.HSA.CED.1. Create equations and inequalities in one variable and use them to solve problems.</li> <li>● CCSS.HSF.A.REI.1. Understand solving equations as a process of reasoning and explain the reasoning. Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.</li> <li>● CCSS.HSA.REI.3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.</li> <li>● CCSS.HSA.CED.A.4: Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law <math>V = IR</math> to highlight resistance <math>R</math></li> <li>● CCSS.MP1 Make sense of problems and persevere in solving them.</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● use their skills of writing and solving equations as an effective problem solving technique.</li> <li>● explain when an inequality should be written rather than an equation.</li> </ul>	
	<i>Meaning</i>	
	<p><b>ENDURING UNDERSTANDINGS</b></p> <ul style="list-style-type: none"> <li>● Operations performed on one side of an equation must be performed on the other side(s) in order to preserve the equality</li> <li>● Solutions to inequalities represent a range of values rather than a single value.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>● How do you use expressions and equations to model real world problems?</li> <li>● How can an equation or inequality be manipulated to isolate a variable while preserving the value of the original equation/inequality?</li> </ul>
	<i>Acquisition</i>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● literal equations</li> <li>● absolute value equations can have multiple solutions.</li> <li>● percentages and proportions.</li> <li>● connections between solving equations and solving inequalities.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● writing and solving multi-step equations with rational coefficients.</li> <li>● writing and solving multi-step one-variable inequalities and graphing them on a number line.</li> <li>● solving and graphing compound inequalities.</li> <li>● graphing inequalities on a number line.</li> <li>● solving absolute value equations.</li> <li>● solving literal equations.</li> </ul>	

<ul style="list-style-type: none"> <li>● CCSS.MP3 Construct viable arguments and critique the reasoning of others.</li> <li>● CCSS.MP4 Model with mathematics.</li> <li>● CCSS.MP7 Look for and make use of structure.</li> <li>● CCSS.MP8 Look for and express regularity in repeated reasoning.</li> </ul>		<ul style="list-style-type: none"> <li>● writing and solving proportions, including proportions with binomials in the numerator or denominator.</li> <li>● writing and solving application percent problems.</li> <li>● solving absolute value inequalities.</li> </ul>
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
		<ul style="list-style-type: none"> <li>● Communication</li> <li>● Critical thinking</li> </ul>

### Stage 2 - Evidence

<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Algebra 1 - Grade 8

### Unit 4: Functions - Linear Functions

#### Stage 1 Desired Results

**ESTABLISHED GOALS:**

Students will continue their study of mathematics in the area of functions. In this unit, students will gain a deeper understanding of linear relationships.

*Content Standards:*

- CCSS.HSF.IF.B.4: For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.
- CCSS.HSF.IF.B.6: Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.
- CCSS.HSF.IF.C.7.A: Graph linear and quadratic functions and show intercepts, maxima, and minima.
- CCSS.HSF.IF.C.8: Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.
- CCSS.HSF.IF.C.9: Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).
- CCSS.HSA.CED.A.1: Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.

*Transfer*

**Students will be able to independently use their learning to...**

- make connections between linear functions and real-life scenarios
- use knowledge of linear functions as they learn other more advanced functions.

*Meaning*

**ENDURING UNDERSTANDINGS**

- Linear relationships have a constant rate of change
- Tables, graphs, and equations are all ways of representing functions and real world phenomena
- Slope can be referenced in many different forms.

**ESSENTIAL QUESTIONS**

- How can graphs be used to solve linear equations?
- How do you determine the appropriate form of an equation for a line when given specific characteristics?
- What is the relationship between slope and rate of change and how can each be used to solve real world problems?

*Acquisition*

*Students will understand...*

- the concept of slope and rate of change
- direct variation equations
- arithmetic sequences.
- equations of lines in slope-intercept form, point slope form, and standard form.
- properties of horizontal and vertical lines.

*Students will be skilled at...*

- calculating slope between two points
- determining the slope of a line, given an equation, table, or graph
- finding and determining intercepts.
- determining whether lines are parallel, perpendicular or neither.
- graphing linear equations.

<ul style="list-style-type: none"> <li>● CCSS.HSA.CED.A.2: Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</li> <li>● CCSS.HSA.REI.D.10: Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).</li> <li>● CCSS.HSF.LE.A.2: Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).</li> <li>● CCSS.HSF.LE.A.1.A: Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.</li> <li>● CCSS.HSF.LE.A.1.B: Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.</li> <li>● CCSS.HSF.LE.B.5: Interpret the parameters in a linear or exponential function in terms of a context.</li> <li>● CCSS.HSF.BF.A.2: Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.</li> <li>● CCSS.MP4 Model with mathematics.</li> <li>● CCSS.MP7 Look for and make use of structure</li> </ul>		<ul style="list-style-type: none"> <li>● writing linear equations in slope-intercept, standard and point-slope form.</li> <li>● writing equations of a line passing through a given point, parallel/perpendicular to a given line.</li> <li>● creating and interpreting linear equations from real world data.</li> <li>● writing a rule given an arithmetic sequence.</li> </ul>
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
		<ul style="list-style-type: none"> <li>● Technology Literacy</li> <li>● Critical Thinking</li> </ul>

## Stage 2 - Evidence

<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Algebra 1 - Grade 8

### Unit 5: Functions - Bivariate Data (Scatterplots)

Stage 1 Desired Results			
<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the area of functions. In this unit, students will gain a deeper understanding of bivariate data.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.HSS.ID.B.6: Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.</li> <li>● CCSS.HSS.ID.B.6.c: Fit a linear function for a scatter plot that suggests a linear association.</li> <li>● CCSS.HSF.S.ID.8 Interpreting linear models-Compute (using technology) and interpret the correlation coefficient of a linear fit.</li> <li>● CCSS.MP4 Model with mathematics.</li> <li>● CCSS.MP5 Use appropriate tools strategically</li> </ul>	<i>Transfer</i>		
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● use their ability to analyze data in scatterplots to analyze real-life data sets</li> <li>● use their knowledge of scatterplots in future studies of statistical data</li> </ul>		
	<i>Meaning</i>		
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● Scatter plots can model data and be used to make predictions.</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● How can mathematics be used to model and make predictions for real world phenomena?</li> </ul> </td> </tr> </table>	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● Scatter plots can model data and be used to make predictions.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● How can mathematics be used to model and make predictions for real world phenomena?</li> </ul>
	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● Scatter plots can model data and be used to make predictions.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● How can mathematics be used to model and make predictions for real world phenomena?</li> </ul>	
<i>Acquisition</i>			
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● scatter plots show relationships between two variables.</li> <li>● some data can be modeled using a linear equation.</li> <li>● equations of a line of best fit.</li> <li>● Correlation of two variables</li> <li>● not all data is linear.</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● representing bivariate data with scatterplots.</li> <li>● interpreting scatterplots.</li> <li>● calculating the line of best fit.</li> <li>● using the line of best fit to find the starting point represented by the y-intercept; to describe what the slope means; and to find the values at a particular point including outside the given graph.</li> <li>● determining if there is a correlation between bivariate data.</li> <li>● making predictions based on the line of best fit.</li> </ul> </td> </tr> </table>	<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● scatter plots show relationships between two variables.</li> <li>● some data can be modeled using a linear equation.</li> <li>● equations of a line of best fit.</li> <li>● Correlation of two variables</li> <li>● not all data is linear.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● representing bivariate data with scatterplots.</li> <li>● interpreting scatterplots.</li> <li>● calculating the line of best fit.</li> <li>● using the line of best fit to find the starting point represented by the y-intercept; to describe what the slope means; and to find the values at a particular point including outside the given graph.</li> <li>● determining if there is a correlation between bivariate data.</li> <li>● making predictions based on the line of best fit.</li> </ul>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● scatter plots show relationships between two variables.</li> <li>● some data can be modeled using a linear equation.</li> <li>● equations of a line of best fit.</li> <li>● Correlation of two variables</li> <li>● not all data is linear.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● representing bivariate data with scatterplots.</li> <li>● interpreting scatterplots.</li> <li>● calculating the line of best fit.</li> <li>● using the line of best fit to find the starting point represented by the y-intercept; to describe what the slope means; and to find the values at a particular point including outside the given graph.</li> <li>● determining if there is a correlation between bivariate data.</li> <li>● making predictions based on the line of best fit.</li> </ul>		
<i>Used in Content Area Standards</i>	<i>21<sup>st</sup> Century Skills</i>		
	<ul style="list-style-type: none"> <li>● Technology Literacy</li> <li>● Critical thinking</li> </ul>		

## Stage 2 - Evidence

*Evaluative Criteria*

*Assessment Evidence*

ASSESSMENT: Written Assessments or Projects

OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Algebra 1 - Grade 8

### Unit 6: Algebraic Equations - Linear Systems

Stage 1 Desired Results		
<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the area of algebraic equations. In this unit, students will gain a deeper understanding of linear systems.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.HSF.A.CED.2: Create equations that describe numbers or relationships- Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</li> <li>● CCSS.HSA.CED.A.3: Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.</li> <li>● CCSS.HSA.REI.C.5: Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions. CCSS.HSA.REI.C.6: Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.</li> <li>● CCSS.HSA.REI.10. Represent and solve equations and inequalities graphically. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane often forming a curve (which could be a line).</li> </ul>	<i>Transfer</i>	
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● extend their knowledge of linear systems to solve nonlinear systems</li> <li>● Recognize systems of linear equations as a valuable problem solving tool</li> </ul>	
	<i>Meaning</i>	
	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● There is more than one way to solve a system of equations, and students can determine the most efficient method for solving.</li> <li>● Systems of equations with two unknowns can be used to solve real world problems.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● How do you solve real world problems using systems of equations?</li> <li>● Which method is best and why?</li> <li>● How can systems of equations be used to represent situations and solve problems?</li> <li>● What does the number of solutions (none, one or infinite) of a system of linear equations represent?</li> </ul>
<i>Acquisition</i>		
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● linear systems as a model</li> <li>● Graphical and algebraic representations of linear systems</li> <li>● linear inequalities and their graphical representation.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● writing and solving linear systems by graphing, elimination, and substitution.</li> <li>● distinguishing if a system of equations has one solution, no solution, or infinitely many solutions.</li> <li>● graphing linear inequalities on a coordinate plane.</li> </ul>	

<ul style="list-style-type: none"> <li>● CCSS.HSA.REI.D.12: Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.</li> <li>● CCSS.MP1 Make sense of problems and persevere in solving them.</li> <li>● CCSS.MP5 Use appropriate tools strategically.</li> <li>● CCSS.MP6 Attend to precision.</li> <li>● CCSS.MP7 Look for and make use of structure.</li> <li>● CCSS.MP8 Look for and express regularity in repeated reasoning.</li> </ul>		<ul style="list-style-type: none"> <li>● graphing systems of linear inequalities on a coordinate plane.</li> <li>● creating and interpreting linear inequalities in one variable.</li> <li>● modeling and solving real world situations with systems of equations.</li> </ul>
<b>Used in Content Area Standards</b>		<b>21<sup>st</sup> Century Skills</b>
		<ul style="list-style-type: none"> <li>● Critical thinking</li> <li>● Technology Literacy</li> </ul>

<b>Stage 2 - Evidence</b>	
<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Algebra 1 - Grade 8

### Unit 7: Algebraic Expressions & Equations Polynomials & Quadratics

Stage 1 Desired Results			
<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the area of algebraic expressions and equations. In this unit, students will gain a deeper understanding of simplifying polynomials and factoring and solving quadratics.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.HSA.SSE.B.3: Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.</li> <li>● CCSS.HSA.SSE.B.3.a: Factor a quadratic expression to reveal the zeros of the function it defines.</li> <li>● CCSS.HSA.APR.A.1: Understand that polynomials form a system analogous to the integers; namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.</li> <li>● CCSS.HSA.REI.B.4: Solve quadratic equations in one variable</li> <li>● CCSS.MP1 Make sense of problems and persevere in solving them.</li> <li>● CCSS.MP2 Reason abstractly and quantitatively.</li> <li>● CCSS.MP7 Look for and make use of structure.</li> </ul>	<i>Transfer</i>		
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● connect their understanding of properties of polynomials to simplify complex numbers and radical expressions</li> <li>● use their understanding of solving quadratic equations when solving higher order equations</li> </ul>		
	<i>Meaning</i>		
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● Mathematical properties extend to simplify polynomials.</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● What characteristics of a polynomial determine how to factor it completely?</li> </ul> </td> </tr> </table>	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● Mathematical properties extend to simplify polynomials.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● What characteristics of a polynomial determine how to factor it completely?</li> </ul>
	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● Mathematical properties extend to simplify polynomials.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● What characteristics of a polynomial determine how to factor it completely?</li> </ul>	
<i>Acquisition</i>			
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● the degree and standard form of a polynomial</li> <li>● factoring polynomials: greatest common factor, difference of squares, trinomial factoring</li> <li>● quadratic equations.</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● simplifying polynomial expressions.</li> <li>● solving quadratic equations by factoring.</li> <li>● solving geometric problems involving polynomials.</li> <li>● factoring quadratics (leading coefficient is 1) and other polynomials.</li> <li>● factoring polynomials</li> </ul> </td> </tr> </table>	<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● the degree and standard form of a polynomial</li> <li>● factoring polynomials: greatest common factor, difference of squares, trinomial factoring</li> <li>● quadratic equations.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● simplifying polynomial expressions.</li> <li>● solving quadratic equations by factoring.</li> <li>● solving geometric problems involving polynomials.</li> <li>● factoring quadratics (leading coefficient is 1) and other polynomials.</li> <li>● factoring polynomials</li> </ul>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● the degree and standard form of a polynomial</li> <li>● factoring polynomials: greatest common factor, difference of squares, trinomial factoring</li> <li>● quadratic equations.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● simplifying polynomial expressions.</li> <li>● solving quadratic equations by factoring.</li> <li>● solving geometric problems involving polynomials.</li> <li>● factoring quadratics (leading coefficient is 1) and other polynomials.</li> <li>● factoring polynomials</li> </ul>		

<i>Used in Content Area Standards</i>	<i>21<sup>st</sup> Century Skills</i>
	<ul style="list-style-type: none"> <li>● Communication</li> <li>● Critical thinking</li> </ul>

### Stage 2 - Evidence

<i>Evaluative Criteria</i>	<i>Assessment Evidence</i>
	ASSESSMENT: Written Assessments or Projects
	OTHER EVIDENCE: independent practice, classroom observations and discussions

# Windham School District Curriculum

## Algebra 1 - Grade 8

### Unit 8: Algebraic Expressions & Equations

### Radical Expressions & Equations

Stage 1 Desired Results			
<p>ESTABLISHED GOALS: Students will continue their study of mathematics in the area of algebraic expressions and equations. In this unit, students will gain a deeper understanding of radical expressions and equations.</p> <p><i>Content Standards:</i></p> <ul style="list-style-type: none"> <li>● CCSS.HSA.SSE.A.2: Use the structure of an expression to identify ways to rewrite it.</li> <li>● CCSS.HSA.SSE.B.3: Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.</li> <li>● CCSS.HSG.SRT.C.8: Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.</li> <li>● CCSS.HSN.RN.A.2: Rewrite expressions involving radicals and rational exponents using the properties of exponents.</li> <li>● CCSS.HSA.REI.A.2: Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.</li> <li>● CCSS.MP7 Look for and make use of structure</li> <li>● CCSS.MP8 Look for and express regularity in repeated reasoning.</li> </ul>	<i>Transfer</i>		
	<p><b>Students will be able to independently use their learning to...</b></p> <ul style="list-style-type: none"> <li>● extend their understanding radical expressions to simplify expressions with rational roots.</li> <li>● use their knowledge of solving radical equations to solve real world scenarios.</li> </ul>		
	<i>Meaning</i>		
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● Radicals represent numbers.</li> <li>● In some operations, radicals mimic variables.</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● How can finding roots help us solve problems?</li> </ul> </td> </tr> </table>	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● Radicals represent numbers.</li> <li>● In some operations, radicals mimic variables.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● How can finding roots help us solve problems?</li> </ul>
	<p>ENDURING UNDERSTANDINGS</p> <ul style="list-style-type: none"> <li>● Radicals represent numbers.</li> <li>● In some operations, radicals mimic variables.</li> </ul>	<p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> <li>● How can finding roots help us solve problems?</li> </ul>	
<i>Acquisition</i>			
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● radical expressions.</li> <li>● Pythagorean theorem</li> <li>● equivalent representations of radical expressions.</li> <li>● radical equations.</li> <li>● extraneous solutions in radical equations.</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● simplifying radical expressions.</li> <li>● adding, subtracting, multiplying, and dividing radicals.</li> <li>● solving problems involving the Pythagorean theorem.</li> <li>● solving radical equations.</li> <li>● determining extraneous solutions when solving radical equations.</li> </ul> </td> </tr> </table>	<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● radical expressions.</li> <li>● Pythagorean theorem</li> <li>● equivalent representations of radical expressions.</li> <li>● radical equations.</li> <li>● extraneous solutions in radical equations.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● simplifying radical expressions.</li> <li>● adding, subtracting, multiplying, and dividing radicals.</li> <li>● solving problems involving the Pythagorean theorem.</li> <li>● solving radical equations.</li> <li>● determining extraneous solutions when solving radical equations.</li> </ul>	
<p><i>Students will understand...</i></p> <ul style="list-style-type: none"> <li>● radical expressions.</li> <li>● Pythagorean theorem</li> <li>● equivalent representations of radical expressions.</li> <li>● radical equations.</li> <li>● extraneous solutions in radical equations.</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>● simplifying radical expressions.</li> <li>● adding, subtracting, multiplying, and dividing radicals.</li> <li>● solving problems involving the Pythagorean theorem.</li> <li>● solving radical equations.</li> <li>● determining extraneous solutions when solving radical equations.</li> </ul>		
<b>Used in Content Area Standards</b>	<b>21<sup>st</sup> Century Skills</b>		
	<ul style="list-style-type: none"> <li>● Communication</li> </ul>		

## Stage 2 - Evidence

*Evaluative Criteria*

*Assessment Evidence*

ASSESSMENT: Written Assessments or Projects

OTHER EVIDENCE: independent practice, classroom observations and discussions