WOODSTOCK
K-8 MATHEMATICS
CURRICULUM

ALIGNED TO
COMMON CORE STATE STANDARDS

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WOODSTOCK MATHEMATICS CURRICULUM

Revised 2013 to Align with

Common Core State Standards for Mathematics

INTRODUCTION

Content standards and curricula are coherent if they are articulated over time as a sequence of topics and performances that are logical and reflect, where appropriate, the sequential or hierarchal nature of the disciplinary content from which the subject matter derives. That is, what and how students are taught should reflect not only the topics that fall within a certain academic discipline, but also the key "big ideas" that determine how knowledge is organized and generated within that discipline.

The following six Guiding Principles are philosophical statements that underlie the Standards for Mathematical Practice.

Guiding Principle 1: Learning

Mathematical ideas should be explored in ways that stimulate curiosity, create enjoyment of mathematics, and develop depth of understanding.

Guiding Principle 2: Teaching

An effective mathematics program is based on a carefully designed set of content standards that are clear and specific, focused, and articulated over time as a coherent sequence.

Guiding Principle 3: Technology

Technology is an essential tool that should be used strategically in mathematics education.

Guiding Principle 4: Equity

All students should have a high quality mathematics program that prepares them for college and a career.

Guiding Principle 5: Literacy Across the Content Areas

An effective mathematics program builds upon and develops students' literacy skills and knowledge.

Guiding Principle 6: Assessment

Assessment of student learning in mathematics should take many forms to inform instruction and learning.

The following eight **Standards for Mathematical Practice** describe varieties expertise that mathematics educators at all levels should seek to develop in their students:

1. **Make sense of problems and persevere in solving them.**
2. **Reason abstractly and quantitatively.**
3. **Construct viable arguments and critique the reasoning of others.**
4. **Model with mathematics.**
5. **Use appropriate tools strategically.**
6. **Attend to precision.**
7. **Look for and make use of structure.**
8. **Look for and express regularity in repeated reasoning.**

This curriculum is not intended to provide daily learning objectives but rather a sequence of units of study for each grade level. Student Learning Objectives (SLOs) provide clear targets from which to plan daily instruction.

The eight Mathematical practices are embedded within the SLOs as students problem solve, model, reason with quantities, and justify answers with viable arguments.

In Kindergarten through eighth grade, the Common Core State Standards are organized into domains that appear in one or more grade level. Only the Geometry domain appears in all grades from Kindergarten through eighth.

WOODSTOCK MATHEMATICS CURRICULUM

GRADE K

UNIT 1: **Counting and Matching Numerals 0-5 with Comparing**

Essential Questions

1. Why do we count?
2. How are numerals used?
3. How can two quantities be related?

Corresponding Big Ideas

1. Counting tells how many there are in a group regardless of their arrangement. The last number said when counting tells the total number of objects counted.
2. Numerals are the symbols we read and write to communicate quantities (numbers).
3. One quantity is either greater than, less than, or equal to another.

UNIT 2: **Counting and Matching Numerals 6-10 with Comparing**

Essential Questions

1. Why do we count?
2. How are numerals used?
3. How can two quantities be related?

Corresponding Big Ideas

1. Counting tells how many there are in a group regardless of the order in which the objects are counted. The last number said when counting tells the total number of objects counted.
2. Numerals are the symbols we read and write to communicate quantities (numbers).
3. One quantity is either greater than, less than, or equal to another.

UNIT 3: **Counting and Matching Numerals 11-20**

Essential Questions

1. Why do we count?
2. How are numerals used?
3. How can two quantities be related?

Corresponding Big Ideas

1. Counting tells how many there are in a group regardless of the order in which the objects are counted. The last number said when counting tells the total number of objects counted.
2. Numerals are the symbols we read and write to communicate quantities (numbers).
3. One quantity is either greater than, less than, or equal to another.

UNIT 4: **Fluency with Addition and Subtraction within 5**

Essential Questions

1. How can addition and subtraction be represented?
2. What constitutes fluency in addition and subtraction?

Corresponding Big Ideas

1. Addition and subtraction can be represented with objects, fingers, mental images, drawings, acting out situations, verbal explanations, expressions, or equations.
2. Adding and subtracting fluently refers to knowledge of procedures, knowledge of when and how to use them appropriately, and skill in performing them flexibly, accurately, and efficiently.

UNIT 5: **Exploring Addition and Subtraction within 10**

Essential Questions

1. How can addition and subtraction be represented?
2. What constitutes fluency in adding and subtracting?

Corresponding Big Ideas

1. Addition and subtraction can be represented with objects, fingers, mental images, drawings, acting out situations, verbal explanations, expressions, or equations.
2. Adding and subtracting fluently refers to knowledge of procedures, knowledge of when and how to use them appropriately, and skill in performing them flexibly, accurately, and efficiently.

UNIT 6: **Teen Numbers (11-19) and Counting to 100**

Essential Questions

1. Why do we count?
2. How can numbers from 11 to 19 be composed and decomposed?

Corresponding Big Ideas

1. Counting tells how many there are in a group regardless of their arrangement. The last number said when counting tells the total number of objects counted.
2. The numbers from 11 to 19 can be composed and decomposed into ten ones and additional ones by using objects or drawings.

UNIT 7: **Identify and Describe 2-D and 3-D Shapes**

Essential Questions

1. How can objects in the environment be described?
2. How can 2 and 3- dimensional shapes be analyzed and compared?

Corresponding Big Ideas

1. Objects in the environment can be described using names of shapes with a description of the relative position of the object.
2. Two and three-dimensional shapes can be analyzed and compared using informal language to describe their similarities, differences, parts, and other attributes.

UNIT 8: **Compare, Analyze, and Compose 2-D and 3-D Shapes**

ESSENTIAL QUESTIONS

1. How can objects in the environment be described?
2. How can 2 and 3-dimensional shapes be analyzed and compared?
3. How can new 2 and 3-dimensional shapes be made?

CORRESPONDING BIG IDEAS

1. Objects in the environment can be described using names of shapes with a description of the relative position of the object.
2. Two and three-dimensional shapes can be analyzed and compared using informal language to describe their similarities, differences, parts, and other attributes.
3. New 2 and 3-dimensional shapes can be made using pattern blocks, tiles, or paper shapes and technology.

UNIT 9: **Measurement by Direct Comparison**

ESSENTIAL QUESTIONS

1. What is necessary to make a direct comparison between 2 objects?

CORRESPONDING BIG IDEAS

1. Two objects must have a measurable attribute in common in order to make a direct comparison between them.

UNIT 1: **Counting and Matching Numerals 0-5 with Comparing**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Count by ones up to 10.	**K.CC.1**
2	Represent the number of objects by the correct numeral up to 5 (using zero to represent no objects).	**K.CC.3**
3	Assign an ascending number name for each object in a group.	**K.CC.4**
4	For objects named in the standard order, identify the last number named as the number of counted objects in the set (regardless of the order they are counted).	**K.CC.4**
5	Know the next number name in counting is always one greater than the previous number.	**K.CC.4**
6	Answer "how many?" questions about groups of objects up to 10 when arranged in a line or up to 5 in a scattered configuration.	**K.CC.5**

UNIT 2: **Counting and Matching Numerals 6-10 with Comparing**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Count by ones up to 10.	**K.CC.1**
2	Assign an ascending number name for each object in a group.	**K.CC.4**
3	For objects named in the standard order, identify the last number named as the number of counted objects in the set.	**K.CC.4**
4	Know the next number name in counting is always one greater than the previous number.	**K.CC.4**
5	Answer "how many?" questions about groups of objects up to 10 when arranged in a line or up to 5 when in a scattered configuration.	**K.CC.5**
6	Count and represent with a written numeral a number of objects up to 10.	**K.CC.3**
7	Write numerals from zero to 10.	**K.CC.3**
8	Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group (groups up to 10 objects).	**K.CC.6**
9	Compare numbers (up to 10) written as numerals.	**K.CC.7**

UNIT 3: **Counting and Matching Numerals 11-20**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Assign an ascending number name for each object in a group.	**K.CC.4**
2	For objects named in the standard order, identify the last number named as the number of counted objects in the set (regardless of the order they are counted).	**K.CC.4**
3	Know the next number name in counting is always one greater than the previous number.	**K.CC.4**
4	Count to 30 by ones and tens.	**K.CC.1**

UNIT 4: **Fluency with Addition and Subtraction within 5**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Create addition and subtraction events with objects (or make drawings) to represent a sum (putting together) or a difference (taking from) up to 10.	**K.OA.1**
2	Fluently add within 5.	**K.OA.5**

UNIT 5: **Exploring Addition and Subtraction within 10**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Create addition and subtraction events with objects (or make drawings) to represent a sum (putting together) or a difference (taking from) up to 10.	**K.OA.1**
2	Use objects or drawings to represent and solve addition and subtraction word problems (within 10).	**K.OA.2**

UNIT 6: **Teen Numbers (11 to 19) and Counting to 100**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Count to 30 by ones and tens.	**K.CC.1**
2	Count forward beginning from any given number up to 50, instead of having to begin at one.	**K.CC.2**
3	Count to 100 by ones and tens.	**K.CC.1**

UNIT 7: **Identify and Describe 2-D and 3-D Shapes**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Classify and sort objects into given categories and count the objects in each category (up to 10 objects).	**K.MD.3**
2	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.	**K.G.1**
3	Correctly name shapes regardless of their orientations or overall size.	**K.G.2**
4	Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid").	**K.G.3**

UNIT 8: **Compare, Analyze, and Compose 2-D and 3-D Shapes**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Analyze and compare two and three-dimensional shapes in different sizes and orientations by counting sides or vertices ("corners") or comparing attributes such as side lengths.	**K.G.4**
2	Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.	**K.G.5**
3	Compose simple shapes to form larger shapes. For example, *"Can you join these two triangles with full sides touching to make a rectangle?"*	**K.G.6**

UNIT 9: **Measurement by Direct Comparison**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Describe measurable attributes of objects, e.g., length and weight.	**K.MD.1**
2	Directly compare and describe two objects with a measurable attribute in common using "more of"/"less of" the attribute. For example, directly compare the heights of two children and describe one child as taller/shorter.	**K.MD.2**

WOODSTOCK MATHEMATICS CURRICULUM

GRADE 1 OVERVIEW

In Grade 1, instructional time should focus on four critical areas: (1) developing understanding of addition, subtraction, and strategies for addition and subtraction within 20; (2) developing understanding of whole number relationships and place value, including grouping in tens and ones: (3) developing understanding of linear measurement and measuring lengths as iterating length units; and (4) reasoning about attributes of, and composing and decomposing geometric shapes.

In Units 1 and 2, students become fluent with addition and subtraction within 10 and begin adding and subtracting within 20.

In Unit 3, students extend their counting to 120 and develop an understanding of two-digit place value.

In Unit 4, students use strategies to add and subtract within 100.

In Unit 5, students distinguish between defining and non-defining attributes of 2-D and 3-D shapes.

In Unit 6, students partition circles and rectangles into two and four equal shares.

In Unit 7, students use their counting skills while measuring with non-standard units.

In Unit 8, students tell and write time in hours and half-hours.

GRADE 1 PACING GUIDE

UNIT TITLE	PACING	STANDARDS
1. Fluency with Addition and Subtraction within 10	6 weeks	**1.OA.1 1.OA.7 1.OA.2 1.OA.8 1.OA.3 1.NBT.1 1.OA.4 1.MD.4 1.OA.5**
2. Exploring Addition and Subtraction within 20	4 weeks	**1.OA.1 1.OA.7 1.OA.2 1.OA.8 1.OA.3 1.NBT.1 1.OA.4 1.MD.4 1.OA.5**
3. Counting and Place Value	6 weeks	**1.NBT.1 1.NBT.5 1.NBT.2 1.MD.4 1.NBT.3**
4. Exploring Addition and Subtraction within 100	6 weeks	**1.OA.3 1.NBT.1 1.OA.5 1.NBT.2 1.OA.7 1.NBT.4 1.NBT.6**
5. Defining Attributes of 2-D and 3-D Shapes	3 weeks	**1.G.1 1.G.2**
6. Partitioning Circles and Rectangles	3 weeks	**1.G.3**
7. Measuring Length with Non-Standard Units	3 weeks	**1.MD.1 1.MD.2**
8. Time to the Hour and Half-Hour	3 weeks	**1.MD.3 1.G.3**

WOODSTOCK MATHEMATICS CURRICULUM

GRADE 1

UNIT 1: **Fluency with Addition and Subtraction within 10**

Essential Questions

1. How can addition and subtraction be represented?
2. What constitutes fluency in adding and subtracting?

Corresponding Big Ideas

1. Addition and subtraction can be represented with objects, fingers, mental images, drawings, acting out situations, verbal explanations, expressions, or equations.
2. Adding and subtracting fluently refers to knowledge of procedures, knowledge of when and how to use them appropriately, and skill in performing them flexibly, accurately, and efficiently.

UNIT 2: **Exploring Addition and Subtraction within 20**

Essential Questions

1. What properties of operations can be used as strategies to add and subtract?

Corresponding Big Ideas

1. The Identity Properties of Addition and Subtraction and the Commutative Property of Addition can be used as strategies when adding and subtracting.

UNIT 3: **Counting and Place Value**

Essential Questions

1. Why do we count?
2. What is the importance of the concept of ten?

Corresponding Big Ideas

1. Counting tells how many there are in a group regardless of the order in which the objects are counted. The last number said when counting tells the total number of objects counted.
2. Understanding and applying the concept of ten leads to future place value concepts.

UNIT 4: **Exploring Addition and Subtraction within 100**

Essential Questions

1. What properties of operations can be used to add and subtract?
2. What is the meaning of the equal sign?

Corresponding Big Ideas

1. The Identity Properties of Addition and Subtraction and the Commutative and Associative Properties of Addition can be used as strategies to add and subtract.
2. The equal sign represents a relationship between two equal quantities.

UNIT 5: **Defining Attributes of 2-D and 3-D Shapes**

Essential Questions

1. What defining attributes can be used to describe 2 and 3-dimensional shapes?

Corresponding Big Ideas

1. Defining attributes such as number of sides, number of angles, number of vertices, straight sides, and closed can be used to describe 2 and 3-dimensional shapes.

UNIT 6: **Partitioning Circles and Rectangles**

Essential Questions

1. What is meant by partitioning circles and rectangles?

Corresponding Big Ideas

1. Partitioning circles and squares means decomposing them into 2 or more equal shares.

UNIT 7: **Measuring Length with Non-Standard Units**

Essential Questions

1. How can the lengths of two objects be compared indirectly?

Corresponding Big Ideas

1. The lengths of two objects can be compared indirectly by using a third object.

UNIT 8: **Time to the Hour and Half-Hour**

ESSENTIAL QUESTIONS

1. What is meant by half-hour when telling time?

CORRESPONDING BIG IDEAS

1. In time telling, the half-hour represents halfway between two consecutive hours or 30 minutes after the hour.

UNIT 1: **Fluency with Addition and Subtraction within 10**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
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.	**1.OA.1**
2	Solve addition word problems with three whole numbers with sums less than or equal to 20.	**1.OA.2**
3	Apply properties of operations to add or subtract whole numbers within 20 (Commutative and Associative Properties of Addition).	**1.OA.3**
4	Solve subtraction problems within 20.	**1.OA.4**
5	Add and subtract within 20 (fluently within 10). Use strategies such as: counting on, making a 10, and decomposing a number leading to a 10.	**1.OA.6**
6	Demonstrate understanding of the equal sign by determining if an equation is true or false.	**1.OA.7**
7	Solve addition or subtraction equations by finding the missing whole number in any position.	**1.OA.8**

UNIT 2: **Exploring Addition and Subtraction within 20**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Use addition and subtraction within 20 to solve word problems involving adding to, taking from, putting together, taking apart, and comparing with unknowns in all positions.	**1.OA.1**
2	Solve addition problems with three whole numbers with sums less than or equal to 20.	**1.OA.2**
3	Apply properties of operations to add or subtract whole numbers within 20 (Commutative and Associative Properties of Addition).	**1.OA.3**
4	Solve subtraction problems within 20.	**1.OA.4**
5	Add and subtract within 20 (fluently within 10) . Use strategies such as: counting on, making a 10, and decomposing a number leading to a 10.	**1.OA.6**
6	Demonstrate understanding of the equal sign by determining if an equation is true or false.	**1.OA.7**
7	Solve addition or subtraction equations by finding the missing whole number in any position.	**1.OA.8**
8	Count forward or backwards from any number within 20 to solve addition and subtraction problems.	**1.OA.5**

UNIT 3: **Counting and Place Value**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Count using verbal or written numerals, starting at any number less than 100.	**1.NBT.1**
2	Count to 120, starting at any number less than 120.	**1.NBT.1**
3	Read and write numerals to 120, including representing a number of objects with a written numeral.	**1.NBT.1**
4	Compose and decompose numbers to 20 to identify the value of the number in the tens and ones places.	**1.NBT.2**
5	Decompose two-digit numbers as the sum of tens and ones for numbers less than 100.	**1.NBT.2**
6	Compare two-digit numbers using <, > and = symbols.	**1.NBT.3**
7	Mentally find ten more or ten less than a number without having to count and explain the reasoning used.	**1.NBT.5**

UNIT 4: **Exploring Addition and Subtraction within 100**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Add a 2-digit and a 1-digit number, and a 2-digit number and a multiple of 10, using concrete models or drawings (sums within 50). Add tens and tens, and ones and ones, by decomposing two-digit numbers and composing an additional ten when necessary.	**1.NBT.4**
2	Subtract multiples of ten from multiples of ten (numbers less than 100, differences greater than or equal to zero) and explain the reasoning used.	**1.NBT.6**
3	Add within 100, including adding a 2-digit number and a 1-digit number, and adding a 2-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 subtraction. Relate the strategy to a written method and explain the reasoning used. Understand that in adding 2-digit numbers , one adds tens and tens, ones and ones, and sometimes it is necessary to compose a ten.	**1.NBT.4**

UNIT 5: **Defining Attributes of 2-D and 3-D Shapes**

	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Name the attributes of a given 2-dimensional shape (square, triangle, rectangle, regular hexagon) distinguishing between defining and non-defining attributes.	**1.G.1**
2	Draw and build shapes when given defining attributes (e.g., 3 sides, 4 sides, 3 corners, 4 corners).	**1.G.1**
3	Compose 2-dimensional shapes (rectangles, squares, trapezoids, triangles, half circles and quarter circles) or 3-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.	**1.G.2**

UNIT 6: **Partitioning Circles and Rectangles**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Partition circles and rectangles into two or four equal shares using halves and fourths (quarters), and use the phrases half of, fourth of, and quarter of.	**1.G.3**
2	Describe the whole circle (or rectangle) partitioned into two or four equal shares as "two of", or "four of" the shares.	**1.G.3**

UNIT 7: **Measuring Length with Non-Standard Units**

	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Order three objects by lengths and compare the lengths of two objects by using the third object (e.g., if the crayon is shorter than the marker and the marker is shorter than the pencil, then the crayon is shorter than the pencil).	**1.MD.1**
2	Use an object to measure another object's length by laying multiple copies end to end with no overlaps giving measurements in whole number units.	**1.MD.2**

UNIT 8: **Time to the Hour and Half-Hour**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Tell and write time to the half-hour using "o'clock" and digital notation.	**1.MD.3**

WOODSTOCK MATHEMATICS CURRICULUM

GRADE 2 OVERVIEW

In Grade 2, instructional time should focus on four critical areas: (1) extending understanding of base-ten notation; (2) building fluency with addition and subtraction; (3) using standard units of measure; and (4) describing and analyzing shapes.

In Unit 1, students use addition and subtraction to solve word problems.

In Unit 2, students develop understanding of base ten place value within 1000.

In Unit 3, students develop fluency with addition and subtraction within 100 and explain why addition and subtraction strategies work.

In Unit 4, students will add and subtract within 1000, using concrete models, drawings, and strategies based on place value and properties of operations.

In Unit 5, students will solve word problems involving money.

In Unit 6, students recognize, describe, and draw various two-dimensional shapes.

In Unit 7, students use appropriate tools to measure lengths of objects in standard and metric units.

In Unit 8, students will tell and write time to the nearest 5 minutes, using a.m. and p.m.

In Unit 9, students draw line plots, bar graphs, and picture graphs to represent data sets.

In Unit 10, students use rectangular arrays and counting to begin to develop an understanding of multiplication.

GRADE 2 PACING GUIDE

UNIT TITLE	PACING	STANDARDS
1. Fact strategies (Addition and Subtraction) up to 20	3 weeks	**2.OA.1** **2.OA.2** **2.NBT.9**
2. Place Value to 1,000	5 weeks	**2.NBT.1** **2.NBT.2** **2.NBT.3** **2.NBT.4**
3. Fluency with Addition and Subtraction within 100	4 weeks	**2.NBT.5** **2.OA.1** **2.NBT.6** **2.MD.5** **2.NBT.9** **2.MD.6** **2.NBT.1**
4. Exploring Addition and Subtraction within 1000	4 weeks	**2.NBT.8** **2.NBT.9** **2.NBT.1** **2.NBT.7**
5. Money	4 weeks	**2.MD.8**
6. Reasoning with Shapes	3 weeks	**2.G.1** **2.G.3**
7. Linear Measurement with Standard Units	4 weeks	**2.MD.1** **2.MD.2** **2.MD.3** **2.MD.4**
8. Time to the Nearest 5 Minutes	3 weeks	**2.MD.7** **2.NBT.2** **2.G.3**
9. Representing, Analyzing, and Interpreting Data	3 weeks	**2.OA.1** **2.MD.9** **2.MD.10**
10. Exploring Multiplication	3 weeks	**2.NBT.2** **2.G.2** **2.OA.3** **2.OA.4**

GRADE 2 PACING GUIDE

UNIT TITLE	PACING	STANDARDS
1. Fact strategies (Addition and Subtraction) up to 20	3 weeks	**2.OA.1** **2.OA.2** **2.NBT.9**
2. Place Value to 1,000	5 weeks	**2.NBT.1** **2.NBT.2** **2.NBT.3** **2.NBT.4**
3. Fluency with Addition and Subtraction within 100	4 weeks	**2.NBT.5** **2.OA.1** **2.NBT.6** **2.MD.5** **2.NBT.9** **2.MD.6** **2.NBT.1**
4. Exploring Addition and Subtraction within 1000	4 weeks	**2.NBT.8** **2.NBT.9** **2.NBT.1** **2.NBT.7**
5. Money	4 weeks	**2.MD.8**
6. Reasoning with Shapes	3 weeks	**2.G.1** **2.G.3**
7. Linear Measurement with Standard Units	4 weeks	**2.MD.1** **2.MD.2** **2.MD.3** **2.MD.4**
8. Time to the Nearest 5 Minutes	3 weeks	**2.MD.7** **2.NBT.2** **2.G.3**
9. Representing, Analyzing, and Interpreting Data	3 weeks	**2.OA.1** **2.MD.9** **2.MD.10**
10. Exploring Multiplication	3 weeks	**2.NBT.2** **2.G.2** **2.OA.3** **2.OA.4**

WOODSTOCK MATHEMATICS CURRICULUM

GRADE 2

UNIT 1: **Fact Strategies (Addition and Subtraction) up to 20**

Essential Questions

1. What strategies can be used to develop fluency with addition and subtraction up to 20?

Corresponding Big Ideas

1. Strategies, such as using place value and the properties of operations, can be used to develop fluency with addition and subtraction up to 20.

UNIT 2: **Place value to 1,000**

Essential Questions

1. In what ways can base-ten numbers be read and written?
2. How can two 3-digit numbers be compared?

Corresponding Big Ideas

1. Base-ten numbers can be read and written using numerals, number names, and expanded form.
2. Two 3-digit numbers can be compared by applying an understanding of place value using the appropriate symbols.

UNIT 3: **Fluency with Addition and Subtraction within 100**

Essential Questions

1. What properties of operations can be used to develop fluency with addition and subtraction up tp 100?

Corresponding Big Ideas

1. The Commutative and Associative Properties of Addition and the Identity Property of Zero can be used to develop fluency with addition and subtraction up to 100.

UNIT 4: **Exploring Addition and Subtraction within 1000**

Essential Questions

1. What strategies can be used to add and subtract within 1000?

Corresponding Big Ideas

1. Concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction can be used to add and subtract within 1000.

UNIT 5: **Money**

Essential Questions

1. How can word problems involving money be solved?

Corresponding Big Ideas

1. Word problems involving money can be solved by recognizing and using coins and bills in context.

UNIT 6: **Reasoning with Shapes**

Essential Questions

1. What attributes can be used to recognize and draw shapes?

Corresponding Big Ideas

1. Attributes, such as a given number of angles, sides, or equal faces, can be used to recognize and draw shapes.

UNIT 7: **Linear Measurement with Standard Units**

Essential Questions

1. What tools can be used to measure the length of an object?
2. How can the appropriate unit of measure be determined?

Corresponding Big Ideas

1. Tools, such as rulers, yardsticks, metric sticks, and measuring tapes, can be used to measure the length of an object.
2. The appropriate unit of measure can be determined by using different tools and different units to measure the same object.

UNIT 8: **Time to the Nearest 5 Minutes**

ESSENTIAL QUESTIONS

1. What strategy can be used to tell and write time to the nearest 5 minutes?

CORRESPONDING BIG IDEAS

1. Skip-counting by fives can be used to recognize 5-minute intervals on a clock.

UNIT 9: **Representing, Analyzing, and Interpreting Data**

ESSENTIAL QUESTIONS

1. How can a data set be represented?

CORRESPONDING BIG IDEAS

1. A data set can be represented by a line plot, a bar graph, or a picture graph.

UNIT 10: **Exploring Multiplication**

ESSENTIAL QUESTIONS

1. What counting strategies can be used to develop an understanding of multiplication?
2. How can multiplication be represented?

CORRESPONDING BIG IDEAS

1. Skip-counting by fives, tens, and hundreds can be used to develop an understanding of multiplication.
2. Multiplication can be represented by partitioning a rectangle or by a rectangular array.

WOODSTOCK MATHEMATICS CURRICULUM

GRADE 3 OVERVIEW

In Grade 3, instructional time should focus on four critical areas: (1) developing understanding of multiplication and division and strategies for multiplication and division within 100; (2) developing understanding of fractions, especially unit fractions (fractions with numerator 1); developing understanding of the structure of rectangular arrays and of area; and (4) describing and analyzing two-dimensional shapes.

In Unit 1, students will solve problems involving all four operations by using place value understanding.

In Unit 2, students develop an understanding of the meanings of multiplication and division of whole numbers through activities and problems involving equal-sized groups, arrays, and area models.

In Unit 3, students use properties of operations to calculate products of whole numbers, using strategies based on these properties to solve multiplication and division problems involving single-digit factors. By comparing a variety of solution strategies, students learn the relationship between multiplication and division.

In Unit 4, students will measure time intervals in minutes. They will also measure and estimate linear distance, mass, and liquid volume.

In Unit 5, students will understand the concepts of area measurement and find areas of rectangles.

In Unit 6, students solve problems involving perimeters of polygons and categorize two-dimensional shapes.

In Unit 7, students express fractions as fair sharing, parts of a whole, and parts of a set.

In Unit 8, students compare fractions to determine equivalence.

GRADE 3 PACING GUIDE

UNIT TITLE	PACING	STANDARDS
1. Computing with Whole Numbers	5 weeks	**3.OA.7 3.NBT.1** **3.OA.8 3.NBT.2** **3.OA.9 3.NBT.3**
2. Understanding Multiplication and Division	4 weeks	**3.OA.1** **3.OA.2** **3.MD.3**
3. Connecting and Using Multiplication and Division	6 weeks	**3.OA.3 3.OA.6** **3.OA.4 3.OA.7** **3.OA.5**
4. Exploring Measurement and Data	4 weeks	**3.MD.1** **3.MD.2** **3.MD.3** **3.MD.4**
5. Understanding Area and Perimeter	5 weeks	**3.MD.5** **3.MD.6** **3.MD.7** **3.MD.8**
6. Reasoning about Two-Dimensional Shapes	4 weeks	**3.MD.8** **3.G.1** **3.G.2**
7. Understanding Fractions	4 weeks	**3.NF.1** **3.NF.2**
8. Reasoning about Fraction Comparisons and Equivalence	4 weeks	**3.NF.3** **3.G.2**

WOODSTOCK MATHEMATICS CURRICULUM

GRADE 3

UNIT 1: **Computing with Whole Numbers**

Essential Questions

1. What constitutes fluency in computing with whole numbers?

Corresponding Big Ideas

1. Fluency refers to knowledge of procedures, knowledge of when and how to use them appropriately, and skill in performing them flexibly, accurately, and efficiently.

UNIT 2: **Understanding Multiplication and Division**

Essential Questions

1. How can problem situations involving multiplication or division be interpreted?

Corresponding Big Ideas

1. Problem situations requiring multiplication or division can be interpreted using pictures, objects, words, numbers, and equations.

UNIT 3: **Connecting and Using Multiplication and Division**

Essential Questions

1. How can an understanding of the properties of operations be developed?
2. What strategies can be used to fluently multiply and divide within 100?

Corresponding Big Ideas

1. By representing expressions using various objects, pictures, words, and symbols, an understanding of properties of operations can be developed.
2. Strategies such as the relationship between multiplication and division or the properties of operations can be used to fluently multiply and divide within 100.

UNIT 4: **Exploring Measurement and Data**

Essential Questions

1. How can a data set be represented?

Corresponding Big Ideas

1. A scaled bar graph and a scaled picture graph can be drawn to represent a data set.

UNIT 5: **Understanding Area and Perimeter**

Essential Questions

1. How can the area of a plane figure be measured?
2. What strategies can be used to solve real world problems involving perimeters of plane figures?

Corresponding Big Ideas

1. The area of a plane figure can be measured by tiling or by multiplying side lengths.
2. Real world problems involving perimeter can be solved by using various tools (such as geo-boards, and interactive whiteboards) and by finding the sum of the side lengths.

UNIT 6: **Reasoning about Two-Dimensional Shapes**

Essential Questions

1. How can two-dimensional figures be categorized?

Corresponding Big Ideas

1. Two-dimensional figures can be categorized by their attributes (such as number of sides, presence or absence of parallel or perpendicular lines, and measures of angles).

UNIT 7: **Understanding Fractions**

Essential Questions

1. What is a fraction?
2. How can a fraction be represented?

Corresponding Big Ideas

1. A fraction *1/b* is the quantity formed by 1 part when the whole is partitioned into b equal parts.
2. A fraction can be represented on a number line.

UNIT 8: **Reasoning about Fraction Comparisons and Equivalence**

ESSENTIAL QUESTIONS

1. What is meant by equivalence of fractions?

CORRESPONDING BIG IDEAS

1. Two fractions are equivalent if they are the same size or the same point on a number line.

UNIT 1: **Computing with Whole Numbers**

	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Round whole numbers to the nearest 10 or 100.	**3.NBT.1**
2	Fluently add and subtract (with regrouping) two 2-digit whole numbers within 100.	**3.NBT.2**
3	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.	**3.NBT.2**
3	Multiply one-digit whole numbers by multiples of 10 (10-90).	**3.NBT.3**
4	Multiply and divide within 40 using strategies such as the relationship between multiplication and division.	**3.OA.7**
5	Find the value of an unknown (expressed as a letter) in an equation that is a representation of a two-step word problem (with any 4 operations) and assess the reasonableness of the value.	**3.OA.8**
6	Recognize arithmetic patterns in addition or multiplication tables and explain the pattern using the properties of operations.	**3.OA.9**

UNIT 2: **Understanding Multiplication and Division**

	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Interpret products of whole numbers as repeated addition or equal groups of objects (up to 100).	**3.OA.1**
2	Explain division as a set of objects partitioned equally into a number of shares (up to 100).	**3.OA.2**
3	Create and interpret scaled picture (or bar) graphs to represent data in 1 and 2-step word problems.	**3.MD.3**

UNIT 3: **Connecting and Using Multiplication and Division**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Use multiplication within 40 to solve word problems using measurement quantities by creating drawings or arrays.	**3.OA.3**
2	Use multiplication within 40 to solve word problems modeled as equal groups or arrays by writing equations.	**3.OA.3**
3	Determine the unknown in a multiplication or division equation relating three whole numbers within 100.	**3.OA.4**
4	Recognize the Commutative, Associative, and Distributive Properties as strategies to add and multiply whole numbers.	**3.OA.5**
5	Solve division of whole numbers by representing the problem as an unknown factor problem.	**3OA.6**
6	Fluently multiply and divide within 50, using the relationship between multiplication and division.	**3.OA.7**
7	Fluently multiply and divide within 100, using the relationship between multiplication and division.	**3.OA.7**

UNIT 4: **Exploring Measurement and Data**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Tell and write time to the nearest minute to solve word problems with addition and subtraction involving time intervals in minutes.	**3.MD.1**
2	Solve one-step word problems by estimating, measuring, and comparing liquid volumes and masses using appropriate tools and units.	**3.MD.2**
3	Create and interpret scaled picture and bar graphs to represent data in 1 and 2-step word problems.	**3.MD.3**
4	Depict data measured in fourths and halves of an inch with a line plot with scales marked in appropriate units.	**3.MD.4**

UNIT 5: **Understanding Area and Perimeter**

	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Find the area of a plane figure, understanding that unit squares are used to measure area of a rectilinear drawing.	**3.MD.5**
2	Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).	**3.MD.6**
3	Find the area of a rectangular array by counting the number of square units and compare that number with the product of the (whole number) side lengths.	**3.MD.6** **3.MD.7**
4	Explain the relationship between tiling/ multiplying side lengths to find the areas of rectangles.	**3.MD.7**
5	Use the area model (with rectangles) to explain the Distributive Property.	**3.MD.7**
6	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. Apply this technique to solve real world problems.	**3.MD.7**

UNIT 6: **Reasoning about Two-Dimensional Shapes**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	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.	**3.MD.8**
2	Understand that shapes in different categories (e.g. rhombuses, rectangles, and others) may share attributes (e.g., having 4 sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Draw examples of quadrilaterals that do not belong to any of these subcategories.	**3.G.1**
3	Represent the equal parts of shapes as a unit fraction (e.g., a pizza cut into 8 equal slices has 8 slices and each slice has the quantity 1/8 of the whole pizza).	**3.G.2**

UNIT 7: **Understanding Fractions**

	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Interpret the unit fraction ***1/b*** as the quantity formed by **1** of **b** equal parts of a whole and the fraction ***a/b*** as the quantity formed by ***a*** parts ***1/b*** (e.g., 3 unit fractions of ¼ add to the quantity ¾).	**3.NF.1**
2	Represent the equal parts of shapes as a unit fraction (e.g., a pizza cut into 8 equal slices has 8 slices and each slice has the quantity 1/8 of the whole pizza).	**3.NF.2**
3	Make a drawing of a number line depicting the position of ***1/b*** (with ***b*** = 2,3,4,6, or 8). Represent the unit fraction 1/2 on the number line by dividing the number line between 0 and 1 into 2 equal lengths and naming the point at the end of the first length as the position of 1/2. Apply the same method for locating the points ¼, 1/3, 1/5, 1/6, and 1/8 on the number line.	**3.NF.2**
4	Make a drawing of a number line depicting a fraction ***a/b*** (with ***a<b*** and ***b*** = 2,3,4,6,or 8).	**3.NF.2**

UNIT 8: **Reasoning about Fraction Comparisons and Equivalence**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Locate equivalent fractions on a number line (with denominators 2,3,4,6, 8).	**3.NF.3**
2	Generate and explain equivalent fractions using visual fraction models (e.g., interpret 1/4 of a group of 12 squares as 3 squares and see the 4 equal subgroups as fourths).	**3.NF.3**
3	Generate and explain whole numbers as fractions, and locate them as fractions on a number line.	**3.NF.3**
4	Compare two fractions with the same numerator or the same denominator using the symbols <, =, >.	**3.NF.3**

WOODSTOCK MATHEMATICS CURRICULUM

GRADE 4 OVERVIEW

In Grade 4, instructional time should focus on three critical areas: (1) developing understanding and fluency with multi-digit multiplication, and developing understanding of dividing to find quotients involving multi-digit dividends; (2) developing an understanding of fraction equivalence, addition and subtraction of fractions with like denominators, and multiplication of fractions by whole numbers; (3) understanding that geometric figures can be analyzed and classified based on their properties, such as having parallel sides, perpendicular sides, particular angle measures, and symmetry.

In Unit 1, students generalize their understanding of place value and apply that to multiplying and dividing whole numbers.

In Units 2 and 3, students apply their understanding of models of multiplication and properties of operations to compute products of multi-digit whole numbers.

In Unit 4, students use their understanding of equivalent fractions to compare and order fractions and decimals.

In Unit 5, students add and subtract mixed numbers with like denominators. They will also learn to multiply a fraction by a whole number and solve related word problems.

In Unit 6, students will understand relative sizes of measurement units within one system of units. Students will also solve word problems involving measurement and apply the area and perimeter formulas for rectangles to solve word problems.

In Unit 7, students recognize angles as geometric shapes. They measure angles and solve addition and subtraction problems to find unknown angles on a diagram.

In Unit 8, students classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines. They also identify special triangles and special quadrilaterals.

GRADE 4 PACING GUIDE

UNIT TITLE	PACING	STANDARDS
1. Understanding and Using Place Value to Multiply and Divide	6 weeks	**4.NBT.1** **4.NBT.2** **4.NBT.3** **4.NBT.5** **4.NBT.6**
2. Factors and Multiples	3 weeks	**4.OA.1** **4.OA.4** **4.OA.5**
3. Multi-Digit Whole Number Computation	4 weeks	**4.OA.2** **4.OA.3** **4.NBT.4**
4. Comparing Fractions and Understanding Decimal Notation	5 weeks	**4.NF.1** **4.NF.2** **4.NF.5** **4.NF.6** **4.NF.7**
5. Building Understanding of Addition, Subtraction, and Multiplication of Fractions	7 weeks	**4.NF.3** **4.NF.4** **4.MD.4**
6. Solving Problems Involving Measurement and Data	4 weeks	**4.MD.1** **4.MD.2** **4.MD.4**
7. Exploring Angles and Angle Measurement	3 weeks	**4.MD.5** **4.MD.6** **4.MD.7**
8. Understanding Properties of Two-Dimensional Figures	4 weeks	**4.OA.5** **4.G.1** **4.G.2** **4.G.3**

WOODSTOCK MATHEMATICS CURRICULUM

GRADE 4

UNIT 1: **Understanding and Using Place Value to Multiply and Divide**

Essential Questions

1. How can two multi-digit whole numbers be compared?
2. What strategies can be used to multiply and divide multi-digit whole numbers?

Corresponding Big Ideas

1. Two multi-digit whole numbers can be compared based on the meaning of the digits in each place, using <, =, > symbols to record the result.
2. Strategies based on place value and the properties of operations can be used to multiply and divide multi-digit whole numbers.

UNIT 2: **Factors and Multiples**

Essential Questions

1. What is the process for finding factor pairs for whole numbers in the range 1 – 100?
2. How can a number or shape pattern be generated?

Corresponding Big Ideas

1. Factor pairs for whole numbers can be determined by finding factors using factor rules.
2. Number or shape patterns can be generated using a repeating sequence or a given rule.

UNIT 3: **Multi-digit Whole Number Computation**

Essential Questions

1. How can multi-step word problems be represented?
2. How can the reasonableness of answers be assessed?

Corresponding Big Ideas

1. Multi-step word problems can be represented using equations, with a letter standing for the unknown quantity.
2. The reasonableness of answers can be assessed using mental computation and estimation strategies, including rounding.

UNIT 4: **Comparing Fractions and Understanding Decimal Notation**

Essential Questions

1. How can equivalent fractions be recognized and generated?
2. How can two decimal numbers be compared?

Corresponding Big Ideas

1. Equivalent fractions can be recognized and generated using visual fraction models.
2. Decimal numbers can be compared based on the meaning of the digits in each place, using <, =, > symbols to record the results.

UNIT 5: **Building Understanding of Addition, Subtraction, and Multiplication of Fractions**

Essential Questions

1. How can word problems involving addition, subtraction, and multiplication of fractions be represented?
2. How can a set of data with unit fractions be displayed?

Corresponding Big Ideas

1. Word problems involving addition, subtraction, and multiplication of fractions can be represented by visual fraction models and equations.
2. A set of data with unit fractions can be displayed in a line plot.

UNIT 6: **Solving Problems Involving Measurement and Data**

Essential Questions

1. Given a single system of measurement, how can measurements in a larger unit be expressed in terms of a smaller unit?
2. How can word problems involving measurement and data be solved ?

Corresponding Big Ideas

1. Measurements in a larger unit can be expressed in terms of a smaller unit within a single system of measurement.
2. Word problems involving measurement and data can be solved using the four operations.

UNIT 7: **Exploring Angles and Angle Measurement**

Essential Questions

1. What is an angle?
2. How can word problems involving addition and subtraction to find the unknown angles in a diagram be solved?

Corresponding Big Ideas

1. An angle is a geometric shape formed wherever two rays share a common endpoint.
2. Addition and subtraction problems to find unknown angles on a diagram can be solved by using an equation.

UNIT 8: **Understanding Properties of Two-Dimensional Figures**

ESSENTIAL QUESTIONS

1. How are two-dimensional figures classified?
2. How can two-dimensional figures be identified as symmetrical?

CORRESPONDING BIG IDEAS

1. Two-dimensional figures are classified based on the presence or absence of parallel and perpendicular lines, or the presence or absence of angles of a specified size.
2. Two-dimensional figures can be identified as symmetrical when the figure can be folded along a line into matching parts.

UNIT 1: **Understanding and Using Place Value to Multiply and Divide**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Explain the quantitative relationship between places of a multi-digit whole number up to one million when moving from right to left.	**4.NBT.1**
2	Compare numbers using <, =, and > for two multi-digit whole numbers up to one million (presented as base ten numerals, number names, or expanded form).	**4.NBT.2**
3	Round multi-digit whole numbers up to one million to any place.	**4.NBT.3**
4	Use strategies to multiply multi-digit numbers and explain the answer using equations, rectangular arrays, and area models.	**4.NBT.5**
5	Use strategies to divide multi-digit dividends by one-digit divisors and explain the answer using equations, rectangular arrays, and area models.	**4.NBT.6**

Unit 2: **Factors and Multiples**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Write multiplication equations from multiplicative comparisons given in words (example, 35 is 5 times as many as 7 and 7 times as many as 5) and describe a multiplication equation in words.	**4.OA.1**
2	Determine if a number between 1 and 100 is a prime or composite number.	**4.OA.4**
3	Find all factor pairs for a whole number up to 100 and determine if it is a multiple of a given 1-digit whole number.	**4.OA.4**
4	Generate number or shape patterns by using rules including words, models, or graphs, and identify apparent features of the pattern that were not explicit in the rule of the original pattern. For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers.	**4.OA.5**

UNIT 3: **Multi-Digit Whole Number Computation**

	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Multiply or divide 3-digit by 1-digit numbers to solve word problems involving multiplicative comparisons.	**4.OA.2**
2	Write an equation to identify the arithmetic operation written in a word problem (without solving).	**4.OA.2**
3	Fluently add and subtract multi-digit whole numbers using the standard algorithm.	**4.NBT.4**
4	Compose equations from information supplied in word problems (with all 4 operations) using letters to represent unknowns (without solving).	**4.OA.3**
5	Compose equations from information supplied in word problems using letters to represent unknowns and solve the word problems with addition and subtraction.	**4.OA.3**
6	Add and subtract two multi-digit whole numbers using the standard algorithm fluently (with speed and accuracy) without a calculator.	**4.NBT.4**
7	Compose equations from information supplied in word problems, using letters to represent unknowns, and solve the word problems (with all 4 operations).	**4.OA.3**

UNIT 4: **Comparing Fractions and Understanding Decimal Notation**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Recognize and generate equivalent fractions and explain why they are equivalent using visual fraction models.	**4.NF.1**
2	Compare two fractions with different numerators and different denominators using <, =, and > and justify the comparison by using visual fraction models (recognizing the comparison is valid only when two fractions refer to the same whole).	**4.NF.2**
3	Add two fractions with respective denominators of 10 and 100 by writing each fraction as a fraction with denominator 100.	**4.NF.5**
4	Use decimal notation to write fractions with denominators of 10 or 100 by writing each fraction as a fraction with denominator 100.	**4.NF.6**
5	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 <, =, or >, and justify the conclusions by using a visual model.	**4.NF.7**

UNIT 5: **Building Understanding of Addition, Subtraction, and Multiplication of Fractions**

	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Decompose a fraction into a sum of fractions with the same denominator in more than one way; record the decomposition as an equation and justify with a visual fraction model.	**4.NF.3**
2	Add and subtract mixed numbers with like denominators by replacing each mixed number with an equivalent fraction.	**4.NF.3**
3	Solve word problems involving addition and subtraction of fractions having like denominators by using visual fraction models and equations to represent the problem.	**4.NF.3**
4	Multiply a fraction by a whole number using visual fraction models and equations, demonstrating a fraction **a/b** as a multiple of **1/b.**	**4.NF.4**
5	Solve 1-step word problems involving multiplication of a fraction by a whole number. *For example, if each person at a party will eat 3/8 of a pound of roast beef, and there 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?*	**4.NF.4**
6	Make a line plot to display a data set in measurements in fractions of a unit (1/2, 1/4, 1/8) and use it to solve problems involving addition and subtraction of fractions with like denominators.	**4.MD.4**

UNIT 6: **Solving Problems involving Measurement and Data**

	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Express measurement comparisons within a single system of measurement and record in a two-column chart within a single system of measurement; *e.g., know that 1 foot is 12 times as long as 1 inch.*	**4.MD.1**
2	Apply area and perimeter formulas for rectangles in real world math problems (whole numbers).	**4.MD.3**
3	Solve word problems involving simple fractions or decimals that incorporate measurement comparisons of like units (including problems that require measurements given in a larger unit in terms of a smaller unit).	**4.MD.2**

UNIT 7: **Exploring Angles and Angle Measurement**

	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Determine the measure of an angle in degrees. The two rays of an angle share a common endpoint. If that endpoint is located at the center of a circle, the fraction of the circular arc (between the points where the rays intersect the circle) measures the angle in degrees. A degree is defined as 1/360 (one degree angle) of the entire circle; and an angle that turns *n* one degree angles is said to measure *n* degrees.	**4.MD.5**
2	Use a protractor to measure angles in whole number degrees and sketch angles of specific measures.	**4.MD.6**
3	Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems using a symbol for an unknown angle measure.	**4.MD.7**

UNIT 8: **Understanding Properties of Two-Dimensional Figures**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines and identify these in two-dimensional figures.	**4.G.1**
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 specific size. Recognize right angles as a category, and identify right triangles.	**4.G.2**
3	Draw lines of symmetry and identify line-symmetric figures.	**4.G.3**

WOODSTOCK MATHEMATICS CURRICULUM

GRADE 5 OVERVIEW

In Grade 5, instructional time should focus on three critical areas: (1) developing fluency with addition and subtraction of fractions, and developing understanding of the multiplication of fractions and of division of fractions in limited cases (unit fractions divided by whole numbers and whole numbers divided by unit fractions; (2) extending division to two-digit divisors, integrating decimal fractions into the place value system and developing understanding of operations with decimals to hundredths , and developing fluency with whole number and decimal operations; and (3) developing understanding of volume.

In Unit 1, students will build on the understanding they developed in 4th grade to read, write, and compare decimals to thousandths.

In Unit 2, students will finalize fluency with multi-digit addition, subtraction, multiplication, and division of whole numbers. They will learn to compute sums, differences, products, and quotients of decimals to hundredths.

In Unit 3, students will write and interpret numerical expressions. They will represent mathematical and real world problems by graphing points on the coordinate plane.

In Unit 4, students will extend previous understandings of equivalent fractions to add and subtract fractions with unlike denominators, including mixed numbers.

In Units 5 and 6, students will apply and extend previous understandings of multiplication and division to multiply and divide fractions. They will find the area of a rectangle with fractional sides by tiling it with unit squares and by multiplying the side lengths to demonstrate procedural equivalence.

In Unit 7, students will classify two-dimensional figures in a hierarchy based on properties of sides and angles. They will derive and use the formula for the area of a triangle and of a parallelogram by comparing it with the formula for the area of a rectangle.

In Unit 8, students will demonstrate an understanding of the concept of volume and find the volume of right rectangular prisms by using unit cubes and by applying the formula for volume.

GRADE 5 PACING GUIDE

UNIT TITLE	PACING	STANDARDS
1. Understanding the Place value System	5 weeks	**5.NBT.1** **5.NBT.2** **5.NBT.3**
2. Computing with Whole Numbers and Decimals	6 weeks	**5.NBT.5** **5.NBT.6** **5.NBT.7**
3. Algebraic Connections	4 weeks	**5.OA.1** **5.OA.2** **5.OA.3** **5.G.1** **5.G.2**
4. Addition and Subtraction of Fractions	5 weeks	**5.NF.1** **5.NF.2** **5.MD.2**
5. Making Sense of Multiplication of Fractions	5 weeks	**5.NF.3** **5.NF.4** **5.NF.5** **5.NF.6**
6. Understanding Division of a Unit Fraction and a Whole Number	4 weeks	**5.NF.7**
7. Classifying 2-Dimensional Figures	3 weeks	**5.G.3** **5.G.4**
8. Exploring Volumes of Solid Figures	4 weeks	**5.MD.3** **5.MD.4** **5.MD.5**

WOODSTOCK MATHEMATICS CURRICULUM

GRADE 5

UNIT 1: **Understanding the Place Value System**

Essential Questions

1. What patterns can be found in the number of zeros of the product when multiplying a number by powers of ten?
2. How can two decimal numbers be compared?

Corresponding Big Ideas

1. There are patterns in the number of zeros in a product when multiplying a number by powers of ten.
2. Decimal numbers can be compared based on the meaning of the digit in each place.

UNIT 2: **Computing with Whole Numbers and Decimals**

Essential Questions

1. What strategies can be used to multiply and divide multi-digit whole numbers?
2. What strategies can be used to add, subtract, multiply , and divide decimal numbers?

Corresponding Big Ideas

1. The standard algorithm can be applied to the multiplication and division of whole numbers.
2. Strategies, including the use of the properties of operations, can be used to add, subtract, multiply, and divide decimal numbers.

UNIT 3: **Algebraic Connections**

Essential Questions

1. What symbols are used to write numerical expressions?
2. How can real world and mathematical problems be represented on the coordinate plane?

Corresponding Big Ideas

1. Symbols (such as parentheses, brackets, and braces) can be used to write and interpret numerical expressions.
2. Real world and mathematical problems can be represented by graphing points in the first quadrant of the coordinate plane.

UNIT 4: **Addition and Subtraction of Fractions**

Essential Questions

1. How can fractions with unlike denominators be added and subtracted?
2. What strategies can be used to solve real world problems involving addition and subtraction of fractions?

Corresponding Big Ideas

1. Fractions with unlike denominators can be added and subtracted by replacing the given fractions with equivalent fractions with common denominators.
2. Strategies (such as estimation, area models, and linear models) can be used to solve real world problems.

UNIT 5: **Making Sense of Multiplication of Fractions**

Essential Questions

1. How is a fraction interpreted?
2. How can the area of a rectangle be determined?

Corresponding Big Ideas

1. A fraction is interpreted as division of the numerator by the denominator.
2. The area of a rectangle can be determined by tiling and by multiplying the fractional side lengths.

UNIT 6: **Understanding Division of a Unit Fraction and a Whole Number**

Essential Questions

1. How can division involving unit fractions and non-zero whole numbers be represented?
2. How can real world problems involving division with unit fractions and non-zero whole numbers be solved?

Corresponding Big Ideas

1. Division involving unit fractions and non-zero whole numbers can be represented by a visual fraction model or by an equation.
2. Real world problems involving unit fractions and non-zero whole numbers can be solved by using visual models and equations.

UNIT 7: **Classifying 2-Dimensional Figures**

Essential Questions

1. How are two-dimensional figures classified?

Corresponding Big Ideas

2. Two-dimensional figures are classified based on the properties of sides and angles.

UNIT 8: **Exploring Volumes of Solid Figures**

Essential Questions

1. How is the volume of a solid figure measured?
2. How can the volume of a solid figure be determined?

Corresponding Big Ideas

1. The volume of a solid figure is measured by counting cubic units.
2. The volume of a solid figure can be determined by the formulas: $V = lwh$ and $V = Bh$.

GRADE 5

UNIT 1: **Understanding the Place Value System**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Explain the "10 times" or 1/10 relationships for place values in multi-digit numbers moving right or left across the places.	**5.NBT.1**
2	Describe the place value of numeral digits relative to both the place to the right and the place to the left (decimal to hundredths and whole numbers to billions).	**5.NBT.1**
3	Recognize and explain patterns of the number of zeros and the placement of the decimal point in a product or quotient when a number is multiplied or divided by powers of ten.	**5.NBT.2**
4	Compare decimals to thousandths based on the value of the digits in each place using the symbols >, =, < when presented as base ten numerals, number names, or expanded form.	**5.NBT.3**
5	Round a decimal to any place.	**5.NBT.4**

UNIT 2: **Computing with Whole Numbers and Decimals**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Use the standard algorithm to multiply multi-digit whole numbers.	**5.NBT.5**
2	Calculate whole number quotients with up to 4-digit dividends and 2-digit divisors. Illustrate and explain answers with equations, rectangular arrays, and area models.	**5.NBT.6**
3	Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value and properties of operations. Explain the reasoning used.	**5.NBT.7**

UNIT 3: **Algebraic Connections**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Evaluate numerical expressions with parentheses, brackets, or braces.	**5.OA.1**
2	Write numerical expressions when given a word problem or a scenario in words and use words to interpret numerical expressions.	**5.OA.2**
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. *For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and determine that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.*	**5.OA.3**
4	Use a pair of perpendicular lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the zero on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates.	**F.G.1**
5	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.	**5.G2**

UNIT 4: **Addition and Subtraction of Fractions**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Add and subtract fractions (including mixed numbers) with unlike denominators.	**5.NF.1**
2	Solve word problems involving adding or subtracting fractions including unlike denominators, and determine if the answer to the problem is reasonable, using estimations with benchmark fractions.	**5.NF.2**
3	Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations with fractions to solve problems involving information presented in line plots. *For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.*	**5.MD.2**

UNIT 5: **Making Sense of Multiplication of Fractions**

	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Interpret a fraction as division of the numerator by the denominator; solve word problems where division of whole numbers leads to fractional or mixed number answers.	**5.NF.3**
2	Multiply fractions by whole numbers and draw visual models or create story contexts. Interpret the product **(a/b)x q** as **a** parts of a whole partitioned into **b** equal parts added **q** times. When multiplying a fraction **a/b** times another fraction **c/d**, then **a(1/b) x c(1/d) = ac x (1/bd) = ac/bd.**	**5.NF.4a**
3	Find the area of a rectangle with fractional side lengths by tiling unit squares and multiplying side lengths.	**5.NF.4b**
4	Explain how a product is related to the magnitude of the factors.	**5.NF.5**
5	Solve real world problems involving multiplication of fractions (including mixed numbers), using visual fraction models or equations to represent the problem.	**5.NF.6**

UNIT 6: **Understanding Division of a Unit Fraction and a Whole Number**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Divide a unit fraction by a non-zero whole number and interpret by creating a story context or visual fraction model.	**5.NF.7a**
2	Divide a whole number by a unit fraction and interpret by creating a story context or visual fraction model.	**5.NF.7b**
3	Solve real world problems involving division of unit fractions by whole numbers or whole numbers by unit fractions.	**5.NF.7c**

UNIT 7: **Classifying 2-Dimensional Figures**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Identify attributes of a two-dimensional shape based on attributes of the groups and categories in which the shape belongs.	**5.G.3**
2	Classify two-dimensional figures in a hierarchy based on properties.	**5.G.4**

UNIT 8: **Exploring Volumes of Solid Figures**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Measure volume by counting the total number of same size cubic units required to fill a figure without gaps or overlaps.	**5.MD.3**
2	Choose an appropriate cubic unit based on the attributes of the three-dimensional figure you are measuring.	**5.MD.4**
3	Show that the volume of a right rectangular prism found by counting all the cubic units is the same as the formulas: $V = lwh$ or $V = Bh$.	**5.MD.5**
4	Explain how both volume formulas relate to counting the cubes in one layer and multiplying that value by the number of layers (height).	**5.MD.5**
5	Find the volume of a composite solid figure composed of two non-overlapping right rectangular prisms.	**5.MD.5**
6	Apply formulas to solve real world and mathematical problems involving volumes of right rectangular prisms and composites of same.	**5.MD.5**

WOODSTOCK MATHEMATICS CURRICULUM

GRADE 6 OVERVIEW

In Grade 6, instructional time should focus on four critical areas: (1) connecting ratio and rate to whole number multiplication and division; (2) developing understanding of and fluency with division of fractions and developing fluency with multiplication of fractions; (3) developing understanding of and using formulas to determine areas of two-dimensional shapes and distinguishing between volume and surface area of three-dimensional shapes; and (4) writing, interpreting, and using expressions and equations.

In Unit 1, students will be able to add, subtract, multiply, and divide fractions fluently, and use these operations to solve problems, including multi-step problems and problems involving measurement.

In Unit 2, students will write mathematical expressions and equations that correspond to given situations, evaluate expressions, and use expressions and formulas to solve problems.

In Unit 3, students will find areas of polygons and surface areas of prisms and pyramids by decomposing into pieces whose areas they can determine.

In Unit 4, students will use reasoning about multiplication and division with quantities to solve ratio and rate problems.

In Unit 5, students will first recognize statistical questions as those that anticipate variability in the answers. They will describe and summarize distributions of data.

In Unit 6, students will find and position rational numbers, including integers, on a number line.

GRADE 6 PACING GUIDE

UNIT TITLE	PACING	STANDARDS
1. Operating with Positive Rational Numbers	6 weeks	**6.NS.1** **6.G.2** **6.NS.2** **6.NS.3** **6.NS.4**
2. Using Expressions and Equations	9 weeks	**6.EE.1** **6.EE.5** **6.EE.2** **6.EE.6** **6.EE.3** **6.EE.7** **6.EE.4** **6.EE.8**
3. Applications of Geometry	5 weeks	**6.G.1** **6.G.3** **6.G.4**
4. Ratios and Rates	6 weeks	**6.RP.1** **6.RP.2** **6.RP.3**
5. Statistics and Distribution	6 weeks	**6.SP.1** **6.SP.4** **6.SP.2** **6.SP.5** **6.SP.3**
6. Understanding Positive and Negative Numbers	4 weeks	**6.NS.5** **6.NS.6** **6.NS.7** **6.NS.8**

WOODSTOCK MATHEMATICS CURRICULUM

GRADE 6

UNIT 1: **Operating with Positive Rational Numbers**

Essential Questions

1. What is the relationship between multiplication and division of fractions?
2. How can standard algorithms be used to add, subtract, multiply, and divide decimals?

Corresponding Big Ideas

1. Visual models and equations can be used to solve problems.
2. The standard algorithms for addition, subtraction, multiplication, and division of whole numbers can be used with decimal numbers.

UNIT 2: **Using Expressions and Equations**

Essential Questions

1. What properties of operations can be used to generate equivalent expressions?
2. What are the parts of an algebraic expression?

Corresponding Big Ideas

1. Properties of operations, such as the Commutative, Associative, and Distributive Properties, can be used to generate equivalent expressions.
2. The parts of an algebraic expression include variables, coefficients, constants, and the names of arithmetic operations.

UNIT 3: **Applications of Geometry**

Essential Questions

1. What techniques can be used to find the area of polygons?

Corresponding Big Ideas

1. Formulas for area and volume can be used to solve mathematical and real world problems.

UNIT 4: **Ratios and Rates**

Essential Questions

1. What is a ratio?
2. What is a unit rate?

Corresponding Big Ideas

1. A ratio is a comparison of two quantities.
2. A unit rate compares a quantity in terms of one unit of another quantity.

UNIT 5: **Statistics and Distributions**

Essential Questions

1. What are the different measures of center for a numerical data set?
2. What is the definition of a statistical question?

Corresponding Big Ideas

1. The measures of center of a data set are the mean, median, and mode.
2. A statistical question is one that anticipates variability in the data related to the question and accounts for it in the answer.

UNIT 6: **Understanding Positive and Negative Numbers**

Essential Questions

1. What is the absolute value of a number?
2. How can points be located on the coordinate plane?

Corresponding Big Ideas

1. The absolute value of a number is its distance from zero on a number line
2. Signs of numbers can be can be used to locate those numbers on the coordinate plane.

UNIT 1: **Operating with Positive Rational Numbers**

	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Compute quotients of fractions.	**6.NS.1**
2	Construct visual fraction models to represent quotients and explain the relationship between multiplication and division of fractions.	**6.NS.1**
3	Solve real world problems involving quotients of fractions and interpret the solutions in the context given.	**6.NS.1**
4	Fluently add, subtract, multiply, and divide multi-digit decimals and whole numbers using standard algorithms.	**6.NS.2** **6.NS.3**
5	Find the greatest common factor of two whole numbers less than or equal to 100, and the least common multiple of two numbers less than or equal to 12.	**6.NS.4**

UNIT 2: **Using Expressions and Equations**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Use mathematical language to identify parts of an expression.	**6.EE.2**
2	Write and evaluate numerical expressions involving whole number exponents.	**6.EE.1**
3	Read, write, and evaluate expressions in which letters stand for numbers (including formulas).	**6.EE.2**
4	Apply the properties of operations to generate equivalent expressions , including the distributive property; for example, *express 36 + 8 as 4(9 + 2) and y + y + y = 3y.*	**6.EE.3**
5	Identify when two expressions are equivalent; for example, *Are these two expressions equal? 81 + 18 and 9(9 + 2).*	**6.EE.4**
6	Use variables to represent numbers and write expressions when solving real world or mathematical problems.	**6.EE.6**
7	Solve an equation or inequality to answer the question: which values from a specified set , if any, make the equation or inequality true? Check the solution using substitution to determine whether a given number in a specified set makes an equation or inequality true (including formulas).	**6.EE.5**
8	Write and solve one-step equations that represent real world or mathematical problems.	**6.EE.7**
9	Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real world or mathematical problem and represent them on a number line diagram.	**6.EE.8**
10	Use variables to represent two quantities that change in relationship to one another in a real world problem and write an equation to express one quantity (the dependent variable) in terms of another quantity (the independent variable).	**6.EE.9**
11	Analyze the relationship between the dependent and independent variables in an equation using graphs and tables. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d=65t to represent the relationship between distance and time.	**6.EE.9**

UNIT 3: **Applications of Geometry**

	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Find the area of right triangles, other triangles, special quadrilaterals and polygons by composing into rectangles or decomposing into triangles and other shapes to solve real world and mathematical problems.	**6.G.1**
2	Represent three dimensional figures using nets made of rectangles and triangles, and use the nets to find the surface area of the figures in the context of solving real world and mathematical problems.	**6.G.4**
3	Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes. Show that the volume is the same as it would be if found by multiplying the edge lengths.	**6.G.2**
4	Draw polygons in the coordinate plane given the coordinates of the vertices and use the coordinates to solve real world distance, perimeter, and area problems.	**6.G.3**

UNIT 4: **Ratios and Rates**

	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Explain the relationship between two quantities of a given ratio and use ratio language to describe the relationship between the two quantities. For example, "The ratio of wings to beaks in the birdhouse at the zoo was 2:1, because for every one beak there were two wings."	**6.RP.1**
2	Use rate language in the context of a ratio relationship to describe a unit rate a/b associated with a ratio a:b ($b \neq 0$). For example, "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger".	**6.RP.2**
3	Use ratio and rate reasoning to solve real world and mathematical problems which include making tables of equivalent ratios, solving unit rate problems, and finding percent of a quantity as a rate per 100.	**6.RP.3**
4	Use ratio and rate reasoning to convert measurement units (manipulate and transform units appropriately when multiplying or dividing quantities).	**6.RP.3**

UNIT 5: **Statistics and Distribution**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Calculate, compare, and interpret measures of center and variability (including mean, median, interquartile range, mean absolute deviation and overall pattern) in a data set to answer a statistical question	**6.SP.1** **6.SP.3** **6.SP.2** **6.SP.5**
2	Display numerical data in plots on the number line (including dot plots, histograms, and box plots) and summarize in relation to their context.	**6.SP.4** **6.SP.5**

UNIT 6: **Understanding Positive and Negative Numbers**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Use positive and negative numbers to describe quantities in real world situations.	**6.NS.5**
2	Locate positive and negative rational numbers on the number line and explain the meaning of absolute value of a rational number as its distance from zero on the number line.	**6.NS.6** **6.NS.7**
3	Write and compare rational numbers using inequality signs.	**6.NS.7**
4	Plot ordered pairs in all four quadrants on the coordinate plane and describe their reflections.	**6.NS.6**
5	Interpret and explain absolute value as magnitude for a positive or negative quantity in a real world situation.	**6.NS.7**
6	Solve real world problems mathematically by graphing points in all four quadrants of the coordinate plane. Use the absolute value of the differences of their coordinates to find distances between points with the same first coordinate or same second coordinate.	**6.NS.8**

WOODSTOCK MATHEMATICS CURRICULUM

GRADE 7 OVERVIEW

In Grade 7, instructional time should focus on four critical areas: (1) developing understanding of and applying proportional relationships; (2) developing understanding of operations with rational numbers and working with expressions and linear equations; (3) solving problems involving scale drawings and informal geometric constructions, and working with two and three-dimensional shapes to solve problems involving area, surface area, and volume; and (4) drawing inferences about populations based on samples.

In Units 1 and 2, students apply and extend previous understandings of operations with fractions to add, subtract, multiply and divide rational numbers.

In Unit 3, students use the properties of operations to generate equivalent expressions. They also solve multi-step mathematical problems with positive and negative rational numbers.

In Unit 4, students analyze proportional relationships and solve related mathematical and real-world problems.

In Unit 5, students investigate the concept of chance to develop, use, and evaluate probability models.

In Unit 6, students use data from a random sample to draw inferences about a population with an unknown characteristic.

In Unit 7, students recognize and represent proportional relationships between quantities.

GRADE 7 PACING GUIDE

UNIT TITLE	PACING	STANDARDS
1. Addition/Subtraction with Rational Numbers	5 weeks	**7.NS.1** **7.NS.3**
2. Multiplication/Division with Rational Numbers	5 weeks	**7.NS.2** **7.NS.3** **7.EE.2** **7.EE.3**
3. Algebraic Reasoning II	5 weeks	**7.EE.1** **7.EE.2** **7.EE.4**
4. Proportional Relationships	7 weeks	**7.RP.1** **7.RP.2** **7.RP.3** **7.G.1**
5. Probability	4 weeks	**7.SP.5** **7.SP.6** **7.SP.7** **7.SP.8**
6. Inferences about Populations	4 weeks	**7.SP.1** **7.SP.2** **7.SP.3** **7.SP.4**
7. Two and Three Dimensional Geometry	6 weeks	**7.G.2** **7.G.3** **7.G.4** **7.G.5** **7.G.6**

WOODSTOCK MATHEMATICS CURRICULUM

GRADE 7

UNIT 1: **Addition and Subtraction with Rational Numbers**

Essential Questions

1. How can addition and subtraction of rational numbers be represented?
2. What property can be used to add and subtract rational numbers?

Corresponding Big Ideas

1. Addition and subtraction of rational numbers can be represented on a number line.
2. Additive inverses have a sum of zero.
3. Subtraction of rational numbers can be understood as adding the additive inverse.

UNIT 2: **Multiplication and Division with Rational Numbers**

Essential Questions

1. What properties of operations can be used when multiplying and dividing rational numbers?
2. How can a rational number be converted to a decimal?

Corresponding Big Ideas

1. Properties of operations, particularly the Distributive Property, can be used to multiply and divide rational numbers.
2. Every quotient of integers (with non-zero divisor) is a rational number.
3. A rational number can be converted to a decimal using long division.

UNIT 3: Algebraic Reasoning II

Essential Questions

1. How can quantities in a real world or mathematical problem be represented?
2. How can algebra be used to efficiently solve real world problems?

Corresponding Big Ideas

1. Variables are used to represent quantities in a real world or mathematical problem.
2. Algebra can be used to solve mathematical and real world problems by writing an equation or inequality and following a sequence of operations to a solution.

UNIT 4: **Proportional Relationships**

Essential Questions

1. What methods can be used to test whether two quantities are in a proportional relationship?
2. How can proportional relationships be represented?

Corresponding Big Ideas

1. Two quantities are in a proportional relationship if there are equivalent ratios in a table of values and the graph is a straight line through the origin.
2. Proportional relationships can be represented by a table, a graph, and an equation.

UNIT 5: **Probability**

Essential Questions

1. In what ways can probability be expressed?
2. What are the critical components of the experiment process?

Corresponding Big Ideas

1. Probability can be expressed as a number between zero and one.
2. Critical components of the experiment process include making predictions, comparing the predictions to the outcomes of the experiments, and replicating the experiment to compare results.

UNIT 6: **Inferences about Populations**

Essential Questions

1. How can statistics be used to make generalizations about a population by examining a sample of the population?

Corresponding Big Ideas

1. Generalizations of a population from a sample are valid only if that sample is representative of that population.

UNIT 7: **Two and Three-Dimensional Geometry**

Essential Questions

1. How can the area and circumference of a circle be determined?
2. How can surface area and volume of three-dimensional objects be determined?

Corresponding Big Ideas

1. There is a relationship between the circumference and area of a circle which can be represented in formulas.
2. Area formulas can be used to find the surface area and volume of three-dimensional objects.

UNIT 1: **Addition and Subtraction with Rational Numbers**

	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Describe and model on a number line, real world situations in which rational numbers are combined.	**7.NS.1**
2	Apply the additive inverse property to subtraction problems and develop the argument that the distance between two points is the absolute value of the difference between their coordinates.	**7.NS.1**
3	Apply properties of operations as strategies to add, subtract, multiply, and divide rational numbers.	**7.NS.2** **7.NS.3**
4	Solve mathematical and real world problems involving addition, subtraction, multiplication, and division of rational numbers.	**7.NS.3**
5	Use tools strategically to solve multi-step real world and mathematical problems involving positive and negative rational numbers in any form, and determine the reasonableness of the answers.	**7.EE.3**

UNIT 2: **Multiplication and Division with Rational Numbers**

	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Explain why a divisor cannot be zero and why division of integers results in a rational number.	**7.NS.2**
2	Model the multiplication and division of signed numbers using real world contexts, such as taking multiple steps backwards.	**7.NS.2**
3	Convert a rational number to a decimal using long division and explain in oral or written language why the decimal is either a terminating or repeating decimal.	**7.NS.2**
4	Apply properties of operations as strategies to add, subtract, multiply, and divide rational numbers.	**7.NS.2** **7.NS.3**
5	Solve mathematical and real world problems involving addition, subtraction, multiplication, and division of rational numbers.	**7.NS.3**
6	Use tools strategically to solve multi-step real world and mathematical problems involving positive and negative rational numbers in any form, and determine the reasonableness of the answers.	**7.EE.3**

UNIT 3: **Algebraic Reasoning II**

	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Apply the properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients (including additive and multiplicative inverse, distributive, commutative, and associative properties).	**7.EE.1** **7.EE.2**
2	Use equivalent expressions to demonstrate the relationship between quantities and determine simpler solutions to a problem.	**7.EE.2**
3	Use variables to represent quantities in a mathematical or real world problem by constructing simple equations and inequalities to represent problems.	**7.EE.4**
4	Fluently solve equations and inequalities and graph the solution set of the inequality; interpret the solutions in the context of the problem.	**7.EE.4**

UNIT 4: **Proportional Relationships**

	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Calculate and determine unit rates of various quantities involving ratios of fractions that contain like and different units using real world examples such as speed and unit price.	**7.RP.1**
2	Determine if a proportional relationship exists between two quantities, e.g. by testing for equivalent ratios in a table or observing whether a graph on the coordinate plane is a straight line through the origin.	**7.RP.2**
3	Identify the constant of a proportionality (unit rate) from tables, graphs, equations, diagrams, and verbal descriptions.	**7.RP.2**
4	Write equations to model proportional relationships in real world problems.	**7.RP.2**
5	Represent real world problems with proportions on a graph and describe how the graph can be used to explain the values of any point *(x,y)* on the graph, including the points (0,0) and (1,r), recognizing that r is the unit rate.	**7.RP.2**
6	Solve multi-step ratio and percent problems using proportional relationships, including scale drawings of geometric figures, simple interest, tax, mark ups and mark downs, gratuities and commissions, and fees.	**7.RP.3**

UNIT 5: **Probability**

	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Interpret and express the likelihood of a chance event as a number between 0 and 1, relating that the probability of an unlikely event is near 0, a likely event is near 1, and ½ is neither likely nor unlikely.	**7.SP.5**
2	Conduct experimental probability events that are both uniform *(rolling a number cube a number of times)* and non-uniform *(tossing a paper cup to see if it lands up or down)* to collect and analyze data to make predictions for the approximate relative frequency of chance events.	**7.RP.3** **7.SP.6**
3	Develop uniform and non-uniform theoretical probability models by listing the probabilities of all possible outcomes in an event; for instance, the probability of a number cube landing on each number being 1/6. Then, conduct an experiment of the event using frequencies to determine the probabilities of each outcome and use the results to explain possible sources of discrepancies in theoretical and experimental probabilities.	**7.SP.7**

UNIT 6: **Inferences about Populations**

	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Distinguish between valid and invalid samples from a population by determining if the sample is representative of the subgroups within the population *(e.g. if the class had 50% girls and the sample had 25% girls, then the number of girls was not representative of the whole population).*	**7.SP.1**
2	Use random sampling to produce a representative sample, develop valid inferences about a population with an unknown characteristic of interest, and compare the variation in estimates using multiple samples of the same and different size.	**7.SP.1** **7.SP.2**
3	Visually and numerically compare the means and variations of two distinct populations (such as the mean height of different sports teams) to draw informal comparative inferences about measures of center and variability using graphical representations and statistical calculations.	**7.SP.3** **7.SP.4**

UNIT 7: **Two and Three-Dimensional Geometry**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	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.	**7.G.6** **7.EE.3** **7.EE.4**
2	Write and solve simple algebraic equations involving supplementary, complementary, vertical, and adjacent angles for multi-step problems. Find the unknown measure of an angle in a figure.	**7.G.5**
3	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.	**7.G.4**
4	Describe, using drawings or written descriptions, the 2-dimensional figures that result when 3-dimensional figures (right rectangular prisms and pyramids) are sliced from multiple angles given both concrete models and a written description of the 3-dimensional figure.	**7.G.3**
5	Use freehand, mechanical (i.e. ruler, protractor) and technological tools to draw geometric shapes with given conditions (e.g. scale factor), focusing on constructing triangles.	**7.G.2**

WOODSTOCK MATHEMATICS CURRICULUM
GRADE 8 OVERVIEW

In Grade 8, instructional time should focus on four critical areas: (1) formulating and reasoning about expressions and equations, including modeling an association in bivariate data with a linear equation, and solving linear equations and systems of equations; (2) grasping the concept of a function and using functions to describe quantitative relationships; (3) analyzing two and three-dimensional space figures using distance, angle, similarity, and congruence; (4) understanding and applying the Pythagorean Theorem.

In Unit 1 of the 8th grade CCSS Mathematics Curriculum, students will learn that there are numbers that are not rational.

In Unit 2, students demonstrate an understanding of congruence and similarity using physical models, transparencies, or geometric software.

In Unit 3, students understand and apply the Pythagorean Theorem.

In Unit 4, students solve real world and mathematical problems involving volume of cylinders, cones, and spheres.

In Unit 5, students work with radicals and integer exponents. They will analyze and solve linear equations.

In Unit 6, students demonstrate an understanding of the relationship between proportional relationships, lines, and linear equations. They will define, compare, and evaluate functions.

In Unit 7, students solve pairs of simultaneous linear equations. They use functions to model relationships between quantities.

In Unit 8, students investigate patterns of association in bivariate data.

GRADE 8 PACING GUIDE

UNIT TITLE	PACING	STANDARDS
1. Number System	4 weeks	8.NS.1 8.NS.2 8.NS.3
2. Congruence and Similarity	4 weeks	8.G.1 8.G.4 8.G.2 8.G.5 8.G.3
3. Pythagorean Theorem	4 weeks	8.G.6 8.G.7 8.G.8
4. Volume	3 weeks	8.G.9
5. Expressions and Equations	4 weeks	8.EE.1 8.EE.2 8.EE.3 8.EE.4
6. Functions and Linear Functions	6 weeks	8.EE.5 8.F.1 8.EE.6 8.F.2 8.EE.7 8.F.3 8.F.4 8.F.5
7. Systems of Linear Equations	3 weeks	8.EE.7 8.EE.8
8. Statistics and Patterns	4 weeks	8.SP.1 8.SP.2 8.SP.3 8.SP.4

WOODSTOCK MATHEMATICS CURRICULUM

GRADE 8

UNIT 1: **Number System**

Pacing: 4 weeks

Essential Questions

1. What is the difference between a rational number and an irrational number?
2. What are square roots and cube roots?
3. How are square roots and cube roots evaluated?

Corresponding Big Ideas

1. A decimal expansion that eventually repeats can be converted into a rational number.
2. Rational approximations of irrational numbers can be used to compare irrational numbers and locate them on a number line.

UNIT 2: **Congruence and Similarity**

Pacing: 5 weeks

Essential Questions

1. What are the differences between congruence and similarity?
2. What are rotations, reflections, and translations?
3. What types of angles are created when parallel lines are cut by a transversal?

Corresponding Big Ideas

1. An effective sequence of rotations, reflections, and translations can be used to prove that two dimensional figures are congruent.
2. Similar figures contain corresponding congruent angles and corresponding proportional side lengths.

UNIT 3: **Pythagorean Theorem**

Pacing: 4 weeks

Essential Questions

1. What is the Pythagorean Theorem?
2. What is the benefit of using the Pythagorean Theorem to determine distance?

Corresponding Big Ideas

1. The Pythagorean Theorem can be proved using squares and their areas.
2. The Pythagorean Theorem can be used to determine unknown side lengths of right triangles.

UNIT 4: **Volume**

Pacing: 3 weeks

Essential Questions

1. What are some real world applications of volume?
2. What are the formulas for finding the volumes of cylinders, cones, and spheres?

Corresponding Big Ideas

1. There are formulas for finding the volumes of cylinders, cones, and spheres.

UNIT 5: **Expressions and Equations**

Pacing: 4 weeks

Essential Questions

1. How are exponents used to express very large or very small numbers?
2. What are the attributes of scientific notation?

Corresponding Big Ideas

1. Integer exponents can be used to simplify numerical expressions.
2. Scientific notation can be used to express the values of very large or very small numbers.

UNIT 6: **Functions and Linear Functions**

Pacing: 6 weeks

Essential Questions

1. What do the slope and y- intercept of a graph represent?
2. What are the characteristics of a function?

Corresponding Big ideas

1. Functions can be classified as either linear or nonlinear.
2. Linear functions can be defined as a rule that assigns one output to each input.
3. Linear functions can be represented as a graph with a slope and intercepts.

UNIT 7: **Systems of Linear Equations**

Pacing: 3 weeks

Essential Questions

1. What does the solution of a system of equations represent?
2. What are the different strategies for solving a system of equations.

Corresponding Big Ideas

1. Systems of equations in two variables can be solved by inspection, algebraically, and/or graphically.

UNIT 8: **Statistics and Patterns**

Pacing: 4 weeks

Essential Questions

1. What is the purpose of a frequency table?
2. What data patterns can be identified and interpreted from a scatter plot?

Corresponding Big Ideas

1. A frequency table can be constructed to analyze and describe possible associations between two variables.
2. A scatter plot can be constructed to identify and interpret data patterns (clustering, outliers, possible lines of best fit, and nonlinear association)

GRADE 8

UNIT 1: **Number System**

	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Compare rational and irrational numbers to demonstrate that the decimal expansion of irrational numbers do not repeat; show that every rational number has a decimal expansion which eventually repeats and convert such decimals into rational numbers.	**8.NS.1**
2	Use rational numbers to approximate and locate irrational numbers on a number line and Estimate the value of expressions involving irrational numbers.	**8.NS.2**

UNIT 2: **Congruence and Similarity**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Utilize the properties of rotation, reflection, and translation to model and relate pre-images of lines, line segments, and angles to their resultant image through physical representations and/or Geometry software.	**8.G.1**
2	Apply an effective sequence of rotations, reflections, and transitions to prove that two dimensional figures are congruent.	**8.G.2**
3	Use the coordinate plane to locate pre-images of two dimensional figures and determine the coordinates of a resultant image after applying dilations, rotations, reflections, and translations.	**8.G.3**
4	Recognize dilation as a reduction or an enlargement of a figure and determine the scale factor.	**8.G.3**
5	Apply an effective sequence of transformations to determine similar figures in which corresponding angles are congruent and corresponding sides are proportional. Write similarity statements based on such transformations	**8.G.4**
6	Justify facts about angles created when parallel lines are cut by a transversal.	**8.G.5**
7	Justify facts about the exterior angles of a triangle, the sum of the measures of the interior angles of a triangle, and the angle-angle relationship used to identify similar triangles.	**8.G.5**

UNIT 3: **Pythagorean Theorem**

	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Explain a Proof of the Pythagorean Theorem and its converse.	**8.G.6**
2	Utilize the Pythagorean Theorem to determine unknown side lengths of right triangles in two and three dimensions to solve real world mathematical problems.	**8.G.7**
3	Use the Pythagorean Theorem to determine the distance between two points in the coordinate plane.	**8.G.8**

UNIT 4: **Volume**

#	STUDENT LEARNING OBJECTIVES	COR
1	Know and apply the appropriate formula for the volume of a cone, a cylinder, or a sphere to solve real world mathematical problems	

UNIT 5: **Expressions and Equations**

	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Apply the properties of integer exponents to simplify and write equivalent numerical expressions.	**8.EE.1**
2	Evaluate square roots and cube roots of small perfect squares and cubes respectively. Use square and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number	**8.EE.2**
3	Identify the square root of 2 as irrational.	**8.EE.2**
4	Use scientific notation to estimate and express the values of very large or very small numbers and compare their values (how many times larger/smaller is one than the other).	**8.EE.3**
5	Perform operations using numbers expressed in scientific notation, including problems where both decimals and scientific notation are used. Interpret scientific notation when a calculator/computer has been used for computation.	**8.EE.4**
6	In real world problem solving situations, choose units of appropriate size for measurement of very large and very small quantities.	**8.EE.4**

UNIT 6: **Functions and Linear Functions**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Graph and analyze the different representations of proportional relationships and interpret the unit rate as the slope of the graph which indicates the rate of change.	**8.EE.5**
2	Derive the equation of a line $(y = mx + b)$ for a line intercepting the vertical axis at b and use similar triangles to explain why the slope (m) is the same between any two points on a non-vertical line on the coordinate plane.	**8.EE.6**
3	Define linear functions as a rule that assigns one output to each input and determine if data represented as a graph or in a table is a function.	**8.F.1**
4	Compare two functions, each represented in a different way (numerically, verbally, graphically, and algebraically) and draw conclusions about their properties (rate of change and intercepts).	**8.F.2**
5	Utilize equations, graphs, and tables to classify functions as linear or non-linear, recognizing that $y = mx + b$ is linear with a constant rate of change.	**8.F.3**
6	Construct a function to model the linear relationship between two variables and determine the rate of change and initial value of the real world data it represents from either graphs or tables.	**8.F.4**
7	Sketch a graph of a function from a qualitative description and give a qualitative description of a graph of a function.	**8.F.5**

UNIT 7: **Systems of Linear Equations**

#	STUDENT LEARNING OBJECTIVES	COR
1	Solve linear equations in one variable with rational number coefficients that might require expanding expressions using the distributive property and/or combining like terms, including examples with one solution, infinite solutions, or no solution.	
2	Solve systems of linear equations in two variables by inspection, algebraically, and/or graphically to demonstrate that solutions refer to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.	

UNIT 8: **Statistics and Patterns**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Construct and interpret scatter plots for measurement data and identify and interpret data patterns (clustering, outliers, positive or negative correlation, possible lines of best fit, and nonlinear correlation.)	**8.SP.1** **8.SP.2**
2	Use a linear equation to model real world problems. Then solve those problems by interpreting the meaning of the slope and the intercept.	**8.SP.3**
3	Construct frequency tables to analyze and describe possible associations between two variables.	**8.SP.4**

WOODSTOCK MATHEMATICS CURRICULUM

ALGEBRA 1 OVERVIEW

Many of the concepts presented in Algebra 1 are progressions of the concepts that were started in grades 6 through 8; the content presented in this course id intended to extend and deepen the previous understandings.

In Unit 1, students create equations, understand solving equations as a process of reasoning, and explain the reasoning.

In Unit 2, students understand the concept of a function and use function notation.

In Unit 3, students represent and solve equations and inequalities graphically.

In Unit 4, students construct, compare, and interpret linear and models and solve problems.

In Unit 5, students solve systems of equations.

In Unit 6, students construct, compare, and interpret exponential functions.

In Unit 7, students perform arithmetic operations on polynomials. They analyze functions using different representations.

ALGEBRA 1 PACING GUIDE

UNIT TITLE	PACING	STANDARDS
1. Linear Equations and Inequalities	6 weeks	**NQ.1 A.CED.1 NQ.2 A.CED.4 NQ.3 A.REI.1 A.SSE.1 A.REI.3**
2. Patterns	4 weeks	**F.IF.3 F.BF.1 F.BF.2**
3. Functions	4 weeks	**A.CED.2 F.IF.4 A.REI.10 F.IF.5 F.IF.1 F.IF.7b F.IF.2 F.IF.9**
4. Linear Relationships	11 weeks	**F.IF.6 F.LE.1 F.IF.7 F.LE.2 F.IF.8 F.LE.5**
5. Systems of Linear Equations	4 weeks	**A.CED.3 A.REI.6 A.REI.5 A.REI.11**
6. Introduction to Exponential Functions	5 weeks	**N.RN.1 F.LE.1 N.RN.2 F.LE.2 A.SSE.1 F.LE.3 F.BF.2 F.LE.5**
7. Quadratic Functions And Equations	5 weeks	**N.RN.3 A.CED.2 A.SSE.3 F.IF.7 A.REI.4 F.IF.8 A.APR.1 F.BF.3 A.CED.1**

WOODSTOCK MATHEMATICS CURRICULUM

GRADE 8 ALGEBRA 1

UNIT 1: **Linear Equations and Inequalities**

Pacing: 6 weeks

Essential Questions

1. What is an equation?
2. What is an inequality?
3. How can we use linear equations and inequalities to solve real world problems?
4. How can models and technology aid in the solving of linear equations and inequalities?

Corresponding Big Ideas

1. To obtain a solution to an equation, no matter how complex, always involves the process of undoing the operations.

UNIT 2: **Patterns**

Pacing: 4 weeks

Essential Questions

1. What is a sequence?
2. How can patterns be represented?
3. What are the advantages and disadvantages of a recursive rule compared to an explicit rule?

Corresponding Big Ideas

1. Analyzing patterns and writing recursive and explicit rules provides a powerful way to extend patterns and make predictions.

UNIT 3: **Functions**

Pacing: 4 weeks

Essential Questions

1. What are the different ways that functions may be represented?
2. How can functions be used to model real world situations, make predictions, and solve problems?

Corresponding Big Ideas

1. Functions are a mathematical way to describe relationships between two quantities that vary.

UNIT 4: **Linear Relationships**

Pacing: 11 weeks

Essential Questions

1. What are the different ways that linear functions may be represented?
2. What is the significance of a linear function's slope and y-intercept?
3. How may linear functions model real world situations?
4. How may linear functions help us analyze real world situations and solve practical problems?
5. How do we make predictions and informed decisions based on current numerical information?
6. What are the advantages and disadvantages of analyzing data by hand versus by using technology?
7. What is the potential impact of making a decision from data that contains one or more outliers?

Corresponding Big Ideas

1. Linear relationships are characterized by a constant average rate of change (or constant additive change).
2. Although scatter plots and trend lines may reveal a pattern, the relationship of the variables may indicate a correlation, but not causation.

UNIT 5: **Systems of Linear Equations**

Pacing: 4 weeks

Essential Questions

1. What does the number of solutions (none, one, or infinite) of a system of equations represent?
2. What are the advantages and disadvantages of solving a system of linear equations graphically versus algebraically?

Corresponding Big Ideas

1. A system of linear equations is an algebraic way to compare two equations that model a situation and find the breakeven point or choose the most efficient plan.

UNIT 6: **An Introduction to Exponential Functions**

Pacing: 5 weeks

Essential Questions

1. What characterizes exponential growth and decay?
2. What are real world models of exponential growth and decay?
3. What are the limitations of exponential growth models?
4. How can one differentiate an exponential model from a linear modal given a real world data set?

Corresponding Big Ideas

1. When comparing an exponential model with a linear model, the question is not *if* the exponential model will generate very large or very small inputs, but rather when.
2. With real data, sometimes deciding whether data is linear or non-linear is more complex than just looking at a graph, differences (y_n - y_{n-1}), or an r-value; it is important to examine differences that are approximately the same more carefully to see if there is a pattern of increasing or decreasing values that, because the pattern is exponential, soon begins to produce outputs of remarkable values.

UNIT 7: **Quadratic Functions and Equations**

Pacing: 5 weeks

Essential Questions

1. What features distinguish the graph of a quadratic function from other graphs?
2. How can an understanding of polynomials help in understanding quadratic functions and equations?
3. What are the advantages and disadvantages of different forms of the quadratic function and different methods for solving quadratic equations?

Corresponding Big Ideas

1. Many real world situations can be modeled with quadratic functions.

ALGEBRA 1

UNIT 1: **Linear Equations and Inequalities**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Solve multi-step problems that can be represented algebraically with accurate and appropriately defined units, scales, and models (such as graphs, tables, and data displays).	**N.Q.1** **N.Q.3** **N.Q.2**
2	Interpret terms, factors, coefficients, and expressions (including complex linear and exponential expressions) in terms of context.	**A.SSE.1**
3	Solve linear equations and inequalities in one variable (including literal equations). Justify each step in the process and solution.	**A.CED.4** **A.REI.3**
4	Create linear equations and inequalities in one variable and use them to solve problems. Justify each step in the process and the solution.	**A.CED.1** **A.REI.3** **A.REI.1**
5	Model and describe constraints with linear equations and inequalities and systems of equations and/or to determine if solutions are viable or non-viable.	**A.REI.1**
6	Create equations and inequalities in one variable and use them to solve problems. *Include equations arising from linear and quadratic functions, simple rational and exponential functions and highlighting a quantity of interest in a formula.*	**A.CED.1** **A.CED.4**

UNIT 2: **PATTERNS**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Write a function for a geometric sequence defined recursively, whose domain is a subset of the integers.	**F.IF.3**
2	Write a function that describes a linear or quadratic relationship between two quantities given in context using an explicit expression, a recursive process, or steps for calculation and relate these functions to the model.	**F.BF.1**

UNIT 3: **Functions**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Create linear equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	**A.CED.2**
2	Explain and interpret the definition of functions including domain and range and how they are related; correctly use function notation in a context and evaluate functions for inputs and their corresponding outputs.	**F.IF.1** **F.IF.2**
3	Graph functions to describe linear relationships between two quantities and identify, describe , and compare domain and other key features in one or multiple representations.	**F.IF.5** **F.IF.9** **F.IF.7**
4	Compare properties of two functions, each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).	**F.IF.9**
5	Create linear and quadratic equations that represent a relationship between two or more variables. Graph equations on the coordinate axes with labels and scale.	**A.CED.2**
6	Sketch the graph of a function that models a relationship between two quantities (expressed symbolically or from a verbal description) showing key features (including intercepts, minimums/maximums, domain, and rate of change)and relate the domain of the graph to its range.	**F.IF.4** **F.IF.5** **F.IF.7**

UNIT 4: **Linear Relationships**

	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Calculate (over a specified period if presented symbolically or as a table) or estimate (if presented graphically) and interpret the average rate of change of a function.	**F.IF.6**
2	Write functions in different but equivalent forms by manipulating quadratic expressions using methods such as factoring and completing the square.	**F.IF.8**
3	Write linear and exponential functions (e.g. growth/decay and arithmetic and geometric sequences) from graphs, tables, or a description of the relationship, recursively and with an explicit formula, and describe how quantities increase linearly and exponentially over equal intervals.	**F.LE.1** **F.LE.2**

UNIT 5: **Systems of Linear Equations**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Solve systems of linear equations in two variables graphically and algebraically. Include solutions that have been found by replacing one equation by the sum of that equation and a multiple of the other.	**A.REI.5**
2	Graph equations, inequalities, and systems of equations and inequalities in two variables and explain that the solution to an equation is all points along the curve, the solution to a system of linear equations is the point of intersection, and the solution to a system of inequalities is the intersection of the corresponding half-planes.	**A.REI.11** **A.REI.12**
3	Graph functions by hand and with technology to describe linear relationships between two quantities and identify, describe, and compare domain and other key features in one or multiple representations.	**A.REI.11**

UNIT 6: **Introduction to Exponential Functions**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Interpret parts of expressions in terms of context, including those that represent square and cube roots; use the structure of an expression to identify ways to rewrite it.	**A.SSE.1** **A.SSE.2**
2	Write linear and exponential functions (e.g. growth/decay and arithmetic and geometric sequences) from graphs, tables, or a description of the relationship, recursively and with an explicit formula, and describe how quantities increase linearly and exponentially over equal intervals.	**F.BF.2**
3	Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.	**A.APR.3**
4	Use properties of integer exponents to explain and convert between expressions involving radical and rational exponents, using correct notation.	**N.RN.1** **N.RN.2**

UNIT 7: **Quadratic Functions and Equations**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Manipulate expressions using factoring, completing the square, and properties of exponents to produce equivalent forms that highlight particular properties such as the zeros or the maximum or minimum value of the function.	**A.SSE.3**
2	Perform addition, subtraction, and multiplication with polynomials and relate it to arithmetic operations with integers.	**A.APR.1**
3	Derive the quadratic formula by completing the square and recognize when there are no real solutions.	**A.REI.4**
4	Solve quadratic equations in one variable using a variety of methods (including inspection, factoring, completing the square, and the quadratic formula).	**A.REI.4**
5	Identify the effects of translations [$f(x) + k$, $k f(x)$, $f(kx)$, and $f(x + k)$] on a function; find the value of k given the graphs.	**F.BF.3**