Common Core State Standards Mathematics
Grades K – High School

Mathletics Curriculum Alignment
Introduction

At Mathletics, we are committed to providing students, teachers and schools with high-quality learning resources that align with the most up-to-date curricula.

Our team of educational publishers has created a course that specifically follows the Common Core State Standards Initiative. You can be assured that students have access to relevant and targeted content.

Mathletics courses consist of topics based on domains, clusters and standards. The courses also include ‘review’ topics to provide additional learning support through targeted revision of topics from the previous grade level.

When a standard is best addressed by teacher directed activities, it is indicated in this document. Such activities may be explored using the Mathletics online eBooks, videos and interactives or through our engaging rich learning tasks.

This document outlines the curriculum alignment and acts as a useful guide when using Mathletics in your school.

3P Learning USA

August 2018
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<thead>
<tr>
<th>Domain</th>
<th>Cluster</th>
<th>Standard</th>
<th>Standard Description</th>
<th>Activities</th>
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<tbody>
<tr>
<td>Counting &amp; Cardinality</td>
<td>A: Know number names and the count sequence.</td>
<td>K.CC.A.1</td>
<td>Count to 100 by ones and tens.</td>
<td>Count to 5&lt;br&gt;Order Numbers to 10&lt;br&gt;Order Numbers to 20&lt;br&gt;Count by Tens&lt;br&gt;Reading Numbers to 30&lt;br&gt;1 to 30&lt;br&gt;Before, After and Between to 20&lt;br&gt;Counting Up to 20</td>
</tr>
<tr>
<td>Counting &amp; Cardinality</td>
<td>A: Know number names and the count sequence.</td>
<td>K.CC.A.2</td>
<td>Count forward beginning from a given number within the known sequence (instead of having to begin at 1).</td>
<td>Counting Forwards&lt;br&gt;Going Up</td>
</tr>
<tr>
<td>Counting &amp; Cardinality</td>
<td>A: Know number names and the count sequence.</td>
<td>K.CC.A.3</td>
<td>Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).</td>
<td>Concept of zero&lt;br&gt;Matching Numbers to 10&lt;br&gt;Matching Numbers to 20</td>
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<tr>
<td>Counting &amp; Cardinality</td>
<td>B: Count to tell the number of objects.</td>
<td>K.CC.B.4</td>
<td>Understand the relationship between numbers and quantities; connect counting to cardinality. a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object. b. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted. c. Understand that each successive number name refers to a quantity that is one larger.</td>
<td>How Many?&lt;br&gt;How Many Dots?</td>
</tr>
<tr>
<td>Counting &amp; Cardinality</td>
<td>B: Count to tell the number of objects.</td>
<td>K.CC.B.5</td>
<td>Count to answer “how many?” questions about as many as 20 objects arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1-20, count out that many objects.</td>
<td>How Many?&lt;br&gt;How Many Dots?</td>
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<td>Counting &amp; Cardinality</td>
<td>C: Compare numbers.</td>
<td>K.CC.C.6</td>
<td>Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group.</td>
<td>Picture Graphs: More or Less&lt;br&gt;More, Less or the Same to 10&lt;br&gt;More, Less or the Same to 20</td>
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<tr>
<td>Counting &amp; Cardinality</td>
<td>C: Compare numbers.</td>
<td>K.CC.C.7</td>
<td>Compare two numbers between 1 and 10 presented as written numerals.</td>
<td>Teacher directed</td>
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<tr>
<td>Operations &amp; Algebraic Thinking</td>
<td>A: Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.</td>
<td>K.OA.A.1</td>
<td>Represent addition and subtraction with objects, fingers, pennies, drawings, sounds, acting out situations, verbal explanations, expressions, equations or other strategies.</td>
<td>Teacher directed</td>
</tr>
<tr>
<td>Operations &amp; Algebraic Thinking</td>
<td>A: Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.</td>
<td>K.OA.A.2</td>
<td>Solve addition and subtraction word problems, and add and subtract within 10.</td>
<td>Adding to 5</td>
</tr>
<tr>
<td>Operations &amp; Algebraic Thinking</td>
<td>A: Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.</td>
<td>K.OA.A.3</td>
<td>Decompose numbers less than or equal to 10 into pairs in more than one way and record each decomposition by a drawing or equation.</td>
<td>Adding to 5</td>
</tr>
<tr>
<td>Operations &amp; Algebraic Thinking</td>
<td>A: Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.</td>
<td>K.OA.A.4</td>
<td>For any number from 1 to 9, find the number that makes 10 when added to the given number. Record the answer with a drawing or equation.</td>
<td>Balance Numbers to 10</td>
</tr>
<tr>
<td>Operations &amp; Algebraic Thinking</td>
<td>A: Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.</td>
<td>K.OA.A.5</td>
<td>Fluently add and subtract within 5.</td>
<td>Adding to 5</td>
</tr>
<tr>
<td>Number &amp; Operations in Base Ten</td>
<td>A: Work with numbers 11–19 to gain foundations for place value.</td>
<td>K.NBT.A.1</td>
<td>Compose and decompose the numbers from 11 to 19 into ten ones and some further ones, and record each composition or decomposition by a drawing or equation; understand that these numbers are composed of the ones and one, two, three, four, five, six, seven, eight, or nine ones.</td>
<td>Making Teen Numbers</td>
</tr>
<tr>
<td>Measurement &amp; Data</td>
<td>A: Describe and compare measurable attributes.</td>
<td>K.MD.A.1</td>
<td>Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.</td>
<td>Everyday Length</td>
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## Kindergarten

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<tr>
<td>Measurement &amp; Data</td>
<td>A: Describe and compare measurable attributes.</td>
<td>K.MD.A.2</td>
<td>Directly compare two objects with a measurable attribute in common, to see which object has &quot;more of&quot;/&quot;less of&quot; the attribute, and describe the difference.</td>
<td>Compare Length</td>
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<td>Which Holds More?</td>
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<td>B: Classify objects and count the number of objects in each category.</td>
<td>K.MD.B.3</td>
<td>Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.</td>
<td>Sort It Same and Different</td>
</tr>
<tr>
<td>Geometry</td>
<td>A: Identify and describe shapes.</td>
<td>K.G.A.1</td>
<td>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.</td>
<td>Where is it?</td>
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<td>K.G.A.2</td>
<td>Correctly name shapes regardless of their orientation or overall size.</td>
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<td>K.G.A.3</td>
<td>Identify shapes as two-dimensional (lying in a plane, &quot;flat&quot;) or three-dimensional (&quot;solid&quot;).</td>
<td>Collect the Shapes</td>
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<td>Collect Simple Shapes</td>
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<td>Match the Solid 1</td>
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<tr>
<td>Geometry</td>
<td>B: Analyze, compare, create and compose shapes.</td>
<td>K.G.B.4</td>
<td>Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts, and other attributes.</td>
<td>Count Sides and Corners</td>
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<td>How many Edges?</td>
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<tr>
<td>Geometry</td>
<td>B: Analyze, compare, create, and compose shapes.</td>
<td>K.G.B.5</td>
<td>Model shapes in the world by building shapes from components and drawing shapes.</td>
<td>Teacher directed</td>
</tr>
<tr>
<td>Geometry</td>
<td>B: Analyze, compare, create, and compose shapes.</td>
<td>K.G.B.6</td>
<td>Compose simple shapes to form larger shapes.</td>
<td>Teacher directed</td>
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<tr>
<td>Operations &amp; Algebraic</td>
<td>A: Represent and solve problems involving addition and subtraction.</td>
<td>1.OA.A.1</td>
<td>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.</td>
<td>Add and Subtract Using Graphs Add and Subtract Problems Adding to 10 Word Problems Problems: Add and Subtract</td>
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<tr>
<td>Algebraic Thinking</td>
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<tr>
<td>Operations &amp; Algebraic</td>
<td>A: Represent and solve problems involving addition and subtraction.</td>
<td>1.OA.A.2</td>
<td>Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20.</td>
<td>Add Three 1-Digit Numbers Add 3 Numbers Using Bonds to 10</td>
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<tr>
<td>Algebraic Thinking</td>
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<tr>
<td>Operations &amp; Algebraic</td>
<td>B: Understand and apply properties of operations and the relationship between addition and subtraction.</td>
<td>1.OA.B.3</td>
<td>Apply properties of operations as strategies to add and subtract.</td>
<td>Commutative Property of Addition Adding in Any Order Add 3 Numbers Using Bonds to 10</td>
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<td>Algebraic Thinking</td>
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<tr>
<td>Operations &amp; Algebraic</td>
<td>B: Understand and apply properties of operations and the relationship between addition and subtraction.</td>
<td>1.OA.B.4</td>
<td>Understand subtraction as an unknown-addend problem.</td>
<td>Related Facts 1</td>
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<td>Algebraic Thinking</td>
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<tr>
<td>Operations &amp; Algebraic</td>
<td>C: Add and subtract within 20.</td>
<td>1.OA.C.5</td>
<td>Relate counting to addition and subtraction.</td>
<td>Addition Facts</td>
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<td>Algebraic Thinking</td>
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<tr>
<td>Operations &amp; Algebraic</td>
<td>C: Add and subtract within 20.</td>
<td>1.OA.C.6</td>
<td>Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as: counting on; making ten; decomposing a number leading to a ten; using the relationship between addition and subtraction; and creating equivalent but easier or known sums.</td>
<td>Fact Families: Add and Subtract Adding to Ten Subtracting from Ten Subtracting from 20 Composing Additions to 20 Add 3 Numbers using bonds to 10 Doubles and Near Doubles</td>
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<td>Algebraic Thinking</td>
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<tr>
<td>Operations &amp; Algebraic</td>
<td>D: Work with addition and subtraction equations.</td>
<td>1.OA.D.7</td>
<td>Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false.</td>
<td>Composing Numbers to 10 Balance Numbers to 20 Composing Additions to 20</td>
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<td>Algebraic Thinking</td>
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<tr>
<td>Operations &amp; Algebraic</td>
<td>D: Work with addition and subtraction equations.</td>
<td>1.OA.D.8</td>
<td>Determine the unknown whole number in an addition or subtraction equation relating three whole numbers.</td>
<td>Related Facts 1 Missing Numbers</td>
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<td>Algebraic Thinking</td>
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<td>Number &amp; Operations in Base Ten</td>
<td>A: Extend the counting sequence.</td>
<td>1.NBT.A.1</td>
<td>Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.</td>
<td>Counting on a 100 grid Make Big Numbers Count Before, After &amp; Between to 100 Count by 2s, 5s and 10s</td>
</tr>
<tr>
<td>Number &amp; Operations in Base Ten</td>
<td>B: Understand place value.</td>
<td>1.NBT.B.2</td>
<td>Understand that the two digits of a two-digit number represent amounts of tens and ones.</td>
<td>Place Value 1 Making Teen Numbers Groups of Ten Complements to 10, 20, 50</td>
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<tr>
<td>Number &amp; Operations in Base Ten</td>
<td>B: Understand place value.</td>
<td>1.NBT.B.3</td>
<td>Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols &gt;, =, and &lt;.</td>
<td>Greater or Less to 100 Compare Numbers to 50 Compare Numbers to 100</td>
</tr>
<tr>
<td>Number &amp; Operations in Base Ten</td>
<td>C: Use place value understanding and properties of operations to add and subtract.</td>
<td>1.NBT.C.4</td>
<td>Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones, and sometimes it is necessary to compose a ten.</td>
<td>Complements to 10, 20, 50 Columns that Add Addictive Addition</td>
</tr>
<tr>
<td>Number &amp; Operations in Base Ten</td>
<td>C: Use place value understanding and properties of operations to add and subtract.</td>
<td>1.NBT.C.5</td>
<td>Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.</td>
<td>10 More, 10 Less 1 More, 10 Less</td>
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<tr>
<td>Number &amp; Operations in Base Ten</td>
<td>C: Use place value understanding and properties of operations to add and subtract.</td>
<td>1.NBT.C.6</td>
<td>Subtract multiples of 10 in the range 10<del>90 from multiples of 10 in the range 10</del>90 (positive or zero difference) 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 used to a written method and explain the reasoning used.</td>
<td>Subtract Tens</td>
</tr>
<tr>
<td>Measurement &amp; Data</td>
<td>A: Measure lengths indirectly and by iterating length units.</td>
<td>1.MD.A.1</td>
<td>Order three objects by length; compare the lengths of two objects indirectly by using a third object.</td>
<td>Compare Length 1  Comparing Length  Everyday Length</td>
</tr>
<tr>
<td>Measurement &amp; Data</td>
<td>A: Measure lengths indirectly and by iterating length units.</td>
<td>1.MD.A.2</td>
<td>Measure the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps.</td>
<td>Measuring length with blocks</td>
</tr>
<tr>
<td>Measurement &amp; Data</td>
<td>B: Tell and write time.</td>
<td>1.MD.B.3</td>
<td>Tell and write time in hours and half-hours using analog and digital clocks.</td>
<td>Hour Times  Half Hour Times  Tell Time to the Half Hour</td>
</tr>
<tr>
<td>Measurement &amp; Data</td>
<td>C: Represent and interpret data.</td>
<td>1.MD.C.4</td>
<td>Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.</td>
<td>Who has the Goods?  Pictographs  Sorting Data 1</td>
</tr>
<tr>
<td>Geometry</td>
<td>A: Reason with shapes and their attributes.</td>
<td>1.G.A.1</td>
<td>Distinguish between defining attributes versus non-defining attributes; build and draw shapes to possess defining attributes.</td>
<td>Teacher directed</td>
</tr>
<tr>
<td>Geometry</td>
<td>A: Reason with shapes and their attributes.</td>
<td>1.G.A.2</td>
<td>Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.</td>
<td>Collect Simple Shapes  Collect the Objects 2  Match the Solid 2</td>
</tr>
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<tr>
<td>Geometry</td>
<td>A: Reason with shapes and their attributes.</td>
<td>1.G.A.3</td>
<td>Partition circles and rectangles into two and four equal shares, describe the shares using the words halves, fourths, and quarters, and use the phrases half of, fourth of, and quarter of. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.</td>
<td>Halves Halves and Quarters</td>
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<tr>
<td>Operations &amp; Algebraic</td>
<td>A: Represent and solve problems involving addition and subtraction.</td>
<td>2.OA.A.1</td>
<td>Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions.</td>
<td>Bar model problems 1</td>
</tr>
<tr>
<td>Algebraic Thinking</td>
<td>B: Add and subtract within 20.</td>
<td>2.OA.B.2</td>
<td>Fluently add and subtract within 20 using mental strategies. Strategies could include: making ten; decomposing a number leading to a ten; using the relationship between addition and subtraction; creating equivalent but easier or known sums; and counting on. By the end of Grade 2, know from memory all sums of two one-digit numbers.</td>
<td>Add to 18, Addition Facts to 18, Subtraction Facts to 18, Simple Subtraction, Addictive Addition, Fact Families: Add and Subtract.</td>
</tr>
<tr>
<td>Operations &amp; Algebraic</td>
<td>C: Work with equal groups of objects to gain foundations for multiplication.</td>
<td>2.OA.C.3</td>
<td>Determine whether a group of objects (up to 20) has an odd or even number of members; write an equation to express an even number as a sum of two equal addends.</td>
<td>Odd or Even, Count by Twos, Counting by Twos</td>
</tr>
<tr>
<td>Algebraic Thinking</td>
<td>C: Work with equal groups of objects to gain foundations for multiplication.</td>
<td>2.OA.C.4</td>
<td>Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.</td>
<td>Groups of Two, Groups of Three, Groups of Four, Groups of Five</td>
</tr>
<tr>
<td>Number &amp; Operations in</td>
<td>A: Understand place value.</td>
<td>2.NBT.A.1</td>
<td>Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones. Understand the following as special cases: a. 100 can be thought of as a bundle of ten tens — called “hundred”. b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).</td>
<td>Place Value Partitioning, Model Numbers, Understanding Place Value 1, Place value 1, Place value 2, Repartition Two-digit Numbers.</td>
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<td>Base Ten</td>
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<tr>
<td>Number &amp; Operations in</td>
<td>A: Understand place value.</td>
<td>2.NBT.A.2</td>
<td>Count within 1000; skip-count by 5s, 10s, and 100s.</td>
<td>Skip Counting with coins, Counting by Fives, Counting by Tens, Count by 2s, 5s and 10s, Counting on a 100 grid.</td>
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<td>Base Ten</td>
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<tr>
<td>Number &amp; Operations in</td>
<td>A: Understand place value.</td>
<td>2.NBT.A.3</td>
<td>Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.</td>
<td>Model Numbers, Repartition Two-digit Numbers, Place value 1, Place value 2, Understanding Place Value 1.</td>
</tr>
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<td>Number &amp; Operations in Base Ten</td>
<td>A: Understand place value.</td>
<td>2.NBT.A.4</td>
<td>Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using &gt;, =, and &lt; symbols to record the results of comparisons.</td>
<td>Which is Bigger? Which is Smaller?</td>
</tr>
<tr>
<td>Number &amp; Operations in Base Ten</td>
<td>B: Use place value understanding and properties of operations to add and subtract.</td>
<td>2.NBT.B.5</td>
<td>Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.</td>
<td>Complements to 10, 20, 50 Adding to 2-digit numbers Subtract Tens Complements to 50 and 100 Strategies for Column Addition Decompose Numbers to Subtract Add and Subtract Using Graphs</td>
</tr>
<tr>
<td>Number &amp; Operations in Base Ten</td>
<td>B: Use place value understanding and properties of operations to add and subtract.</td>
<td>2.NBT.B.6</td>
<td>Add up to four two-digit numbers using strategies based on place value and properties of operations.</td>
<td>Add 3 Numbers: Bonds to 100 Add 3 Numbers: Bonds to Multiples of 10 Columns that Add Columns that Subtract</td>
</tr>
<tr>
<td>Number &amp; Operations in Base Ten</td>
<td>B: Use place value understanding and properties of operations to add and subtract.</td>
<td>2.NBT.B.7</td>
<td>Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.</td>
<td>Add Two 2-Digit Numbers Add Two 2-Digit Numbers: Regroup Add Three 2-Digit Numbers Add Three 2-Digit Numbers: Regroup Add 3-Digit Numbers Add 3-Digit Numbers: Regroup 2-Digit Differences 2-Digit Differences: Regroup 3-Digit Differences 3-Digit Differences with Zeros 3-Digit Differences: 1 Regrouping 3-Digit Differences: 2 Regroupings</td>
</tr>
<tr>
<td>Number &amp; Operations in Base Ten</td>
<td>B: Use place value understanding and properties of operations to add and subtract.</td>
<td>2.NBT.B.8</td>
<td>Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.</td>
<td>Magic Mental Addition Mental Subtraction</td>
</tr>
<tr>
<td>Number &amp; Operations in Base Ten</td>
<td>B: Use place value understanding and properties of operations to add and subtract.</td>
<td>2.NBT.B.9</td>
<td>Explain why addition and subtraction strategies work, using place value and the properties of operations.</td>
<td>Teacher directed</td>
</tr>
<tr>
<td>Measurement &amp; Data</td>
<td>A: Measure and estimate lengths in standard units.</td>
<td>2.MD.A.1</td>
<td>Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.</td>
<td>Measuring Length How Long Is That (Customary)? Measure to the Nearest Half Inch</td>
</tr>
<tr>
<td>Measurement &amp; Data</td>
<td>A: Measure and estimate lengths in standard units.</td>
<td>2.MD.A.2</td>
<td>Measure the length of an object twice, using different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.</td>
<td>Teacher directed</td>
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### Grade 2

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<tr>
<th>Domain</th>
<th>Cluster</th>
<th>Standard</th>
<th>Standard Description</th>
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<tbody>
<tr>
<td>Measurement &amp; Data</td>
<td>A: Measure and estimate lengths in standard units.</td>
<td>2.MD.A.3</td>
<td>Estimate lengths using units of inches, feet, centimeters, and meters.</td>
<td>Inches, Feet, Yards</td>
</tr>
<tr>
<td>Measurement &amp; Data</td>
<td>A: Measure and estimate lengths in standard units.</td>
<td>2.MD.A.4</td>
<td>Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.</td>
<td>Teacher directed</td>
</tr>
<tr>
<td>Measurement &amp; Data</td>
<td>B: Relate addition and subtraction to length.</td>
<td>2.MD.B.5</td>
<td>Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units.</td>
<td>Teacher directed</td>
</tr>
<tr>
<td>Measurement &amp; Data</td>
<td>B: Relate addition and subtraction to length.</td>
<td>2.MD.B.6</td>
<td>Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represent whole-number sums and differences within 100 on a number line diagram.</td>
<td>Number Lines</td>
</tr>
<tr>
<td>Measurement &amp; Data</td>
<td>C: Work with time and money.</td>
<td>2.MD.C.7</td>
<td>Tell and write time from analog and digital clocks to the nearest five minutes using a.m and p.m.</td>
<td>Five Minute Times</td>
</tr>
<tr>
<td>Measurement &amp; Data</td>
<td>C: Work with time and money.</td>
<td>2.MD.C.8</td>
<td>Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately.</td>
<td>Using Fewest Coins to Make an Amount, Who’s got the Money?</td>
</tr>
<tr>
<td>Measurement &amp; Data</td>
<td>D: Represent and interpret data.</td>
<td>2.MD.D.9</td>
<td>Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.</td>
<td>Teacher directed</td>
</tr>
<tr>
<td>Measurement &amp; Data</td>
<td>D: Represent and interpret data.</td>
<td>2.MD.D.10</td>
<td>Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.</td>
<td>Making Graphs, Bar Graphs 1, Picture Graphs: single-unit scale</td>
</tr>
<tr>
<td>Geometry</td>
<td>A: Reason with shapes and their attributes.</td>
<td>2.G.A.1</td>
<td>Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.</td>
<td>Collect the Polygons, How many Faces?, How many Edges?, How many Corners?, Count Sides and Corners</td>
</tr>
<tr>
<td>Geometry</td>
<td>A: Reason with shapes and their attributes.</td>
<td>2.G.A.2</td>
<td>Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.</td>
<td>Teacher directed</td>
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<tr>
<td>Geometry</td>
<td>A: Reason with shapes and their attributes.</td>
<td>2.G.A.3</td>
<td>Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.</td>
<td>Shape Fractions</td>
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<td>Halves and Quarters</td>
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<tr>
<td>Operations &amp; Algebraic</td>
<td>A: Represent and solve problems involving multiplication and division.</td>
<td>3.OA.A.1</td>
<td>Interpret products of whole numbers.</td>
<td>Groups of Two, Groups of Three, Groups of Four, Groups of Five, Groups of Six, Groups of Seven, Groups of Eight, Groups of Nine, Groups of Ten, Times Tables, Multiplication Arrays, Multiplication Arrays, Frog Jump Multiplication, Multiplication Arrays, Model Multiplication to 5 x 5</td>
</tr>
<tr>
<td>Thinking</td>
<td>A: Represent and solve problems involving multiplication and division.</td>
<td>3.OA.A.2</td>
<td>Interpret whole-number quotients of whole numbers.</td>
<td>Divide Into Equal Groups, Dividing Threes, Dividing Fours, Dividing Fives, Dividing Sixes, Dividing Sevens, Dividing Eights, Dividing Nines, Dividing Tens, Division Facts</td>
</tr>
<tr>
<td></td>
<td>A: Represent and solve problems involving multiplication and division.</td>
<td>3.OA.A.3</td>
<td>Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities.</td>
<td>Problems: Times and Divide, I am Thinking of a Number!, Word Problems with Letters</td>
</tr>
<tr>
<td></td>
<td>A: Represent and solve problems involving multiplication and division.</td>
<td>3.OA.A.4</td>
<td>Determine the unknown whole number in a multiplication or division equation relating three whole numbers.</td>
<td>Related Facts 2</td>
</tr>
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<td>B: Understand properties of multiplication and the relationship between multiplication and division.</td>
<td>3.OA.B.5</td>
<td>Apply properties of operations as strategies to multiply and divide.</td>
<td>Multiplication Turn-Arounds, Fact Families: Multiply and Divide</td>
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<td>B: Understand properties of multiplication and the relationship between multiplication and division.</td>
<td>3.OA.B.6</td>
<td>Understand division as an unknown-factor problem.</td>
<td>Related Facts 2, Division Facts, Multiplication Facts</td>
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## Grade 3

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<tr>
<td>Operations &amp; Algebraic Thinking</td>
<td>C: Multiply and divide within 100.</td>
<td>3.OA.C.7</td>
<td>Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.</td>
<td>Related Facts 2</td>
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<td>Fact Families: Multiply and Divide Times Tables</td>
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<tr>
<td>Operations &amp; Algebraic Thinking</td>
<td>D: Solve problems involving the four operations, and identify and extend patterns in arithmetic.</td>
<td>3.OA.D.8</td>
<td>Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.</td>
<td>Problems: Times and Divide Word Problems with Letters</td>
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<td>I am Thinking of a Number!</td>
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<tr>
<td>Operations &amp; Algebraic Thinking</td>
<td>D: Solve problems involving the four operations, and identify and extend patterns in arithmetic.</td>
<td>3.OA.D.9</td>
<td>Identify and extend arithmetic patterns (including patterns in the addition table or multiplication table) and explain them using properties of operations.</td>
<td>Increasing Patterns</td>
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<td>Decreasing Patterns</td>
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<tr>
<td>Number &amp; Operations in Base Ten</td>
<td>A: Use place value understanding and properties of operations to perform multi-digit arithmetic.</td>
<td>3.NBT.A.1</td>
<td>Use place value understanding to round whole numbers to the nearest 10 or 100.</td>
<td>Nearest Ten?</td>
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<td>Nearest Hundred?</td>
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<tr>
<td>Number &amp; Operations in Base Ten</td>
<td>A: Use place value understanding and properties of operations to perform multi-digit arithmetic.</td>
<td>3.NBT.A.2</td>
<td>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.</td>
<td>Strategies for Column Addition</td>
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<td>Add 3-Digit Numbers</td>
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<td>Add 3-Digit Numbers: Regroup</td>
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<td>Add Multi-Digit Numbers 1</td>
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<td>Add Three 1-Digit Numbers</td>
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<td>Add Three 2-Digit Numbers</td>
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<td>Addition Properties</td>
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<td>Estimate Differences</td>
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<td>Simple Subtraction</td>
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<td>Fact Families: Add and Subtract</td>
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<td>Bar Model Problems 2</td>
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<td>Missing Numbers 1</td>
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<td>3-Digit Differences</td>
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<td>3-Digit Differences with Zeros</td>
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<td>3-Digit Differences: 1</td>
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<td>3-Digit Differences: 2</td>
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<td>Multiply Multiples of 10</td>
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<td>Multiply More Multiples of 10</td>
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<td>Equivalent Facts: Multiply</td>
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<td>Multiplication Grids</td>
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<td>Short Multiplication</td>
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<td>Multiply: 1-Digit Number</td>
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<td>Multiply: 1-Digit Number, Regroup</td>
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<td>Multiply: 2-Digit by 1-Digit</td>
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# Grade 3

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</table>
| Number & Operations — Fractions | A: Develop understanding of fractions as numbers.                      | 3.NF.A.1 | Understand a fraction \( \frac{1}{b} \) as the quantity formed by 1 part when a whole is partitioned into \( b \) equal parts. Understand a fraction \( \frac{a}{b} \) is the quantity formed by a parts of size \( \frac{1}{b} \). | Fractions  
Model Fractions  
What Fraction Is Shaded?  
Halves and Quarters  
Thirds and Sixths |
| Number & Operations — Fractions | A: Develop understanding of fractions as numbers.                      | 3.NF.A.2 | Understand a fraction as a number on the number line; represent fractions on a number line diagram.  
a. Represent a fraction \( \frac{1}{b} \) on a number line by defining the interval from 0 to 1 as the whole and partitioning it into \( b \) equal parts. Recognize that each part has size \( \frac{1}{b} \) and that the endpoint of the part based at 0 locates the number \( \frac{1}{b} \) on the number line.  
b. Represent a fraction \( \frac{a}{b} \) on a number line diagram by marking off \( a \) lengths \( \frac{1}{b} \) from 0. Recognize that the resulting interval has size \( \frac{a}{b} \) and that its endpoint locates the number \( \frac{a}{b} \) on the number line. | Counting with Fractions on a Number Line |
| Number & Operations — Fractions | A: Develop understanding of fractions as numbers.                      | 3.NF.A.3 | Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.  
a. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.  
b. Recognize and generate simple equivalent fractions. Explain why the fractions are equivalent.  
c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers.  
d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols \( > \), \( = \), or \( < \), and justify the conclusions. | Comparing Fractions 1  
Part-whole rods 1  
Part-whole rods 2  
Uneven partitioned shapes 1 |
| Measurement & Data            | A: Solve problems involving measurement and estimation.                 | 3.MD.A.1 | Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes. | What is the Time?  
Five Minute Times  
Time Mentals  
Elapsed Times |
<table>
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</table>
| Measurement & Data | A: Solve problems involving measurement and estimation.                  | 3.MD.A.2 | Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units. | Mass Word Problems  
Cups, Pints, Quarts, Gallons                           |
| Measurement & Data | B: Represent and interpret data.                                         | 3.MD.B.3 | Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs. | Making Graphs  
Pictographs  
Bar Graphs 1  
Bar Graphs 2  
Add and Subtract Using Graphs  
Picture Graphs: with scale & half symbols                   |
| Measurement & Data | B: Represent and interpret data.                                         | 3.MD.B.4 | Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units — whole numbers, halves, or quarters. | Teacher directed                                         |
| Measurement & Data | C: Geometric measurement: understand concepts of area and relate area to multiplication and to addition. | 3.MD.C.5 | Recognize area as an attribute of plane figures and understand concepts of area measurement.  
a. A square with side length 1 unit, called “a unit square”, is said to have “one square unit” of area, and can be used to measure area.  
b. A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units. | Equal Areas  
Biggest Shape                                                   |
| Measurement & Data | C: Geometric measurement: understand concepts of area and relate area to multiplication and to addition. | 3.MD.C.6 | Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).                                                                                                                   | Area of Shapes  
Area of Shapes (inches, feet, yards)                      |
### Grade 3

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| Measurement &  | C: Geometric measurement: understand concepts of area and relate area to | 3.MD.C.7       | Relate area to the operations of multiplication and addition.  
  Data                                                        | Area of Shapes  |
<p>|                 | Multiplication and to addition.                                         |                | a. Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.                                                                 | Area of Squares and Rectangles                  |
|                 |                                                                         |                | b. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning. | Area of Shapes (inches, feet, yards)            |
|                 |                                                                         |                | c. Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths $a$ and $b + c$ is the sum of $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning. | Area of Compound Figures                        |
|                 |                                                                         |                | d. Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems. |                                                 |
| Measurement &amp;  | D: Geometric measurement: recognize perimeter.                          | 3.MD.D.8       | Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters. | Area of Shapes (inches, feet, yards) Perimeter  |
|                 |                                                                         |                | Perimeter: Squares and Rectangles Perimeter Detectives I Perimeter of Shapes                                                                                                                                   | Shapes                                         |
| A: Reason with  | A: Reason with shapes and their                                       | 3.G.A.1        | Understand that shapes in different categories may share attributes, and that the shared attributes can define a larger category. Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories. | Collect the Shapes 1                           |
| Geometry        | shapes and their attributes.                                            |                |                                                                                           | Collect the Shapes 2                           |
|                 |                                                                        |                |                                                                                           | Collect More Shapes                            |
|                 |                                                                        |                |                                                                                           | Collect the Polygons                           |
|                 |                                                                        |                |                                                                                           | Relate Shapes and Solids                       |
|                 |                                                                        |                |                                                                                           | Count Sides and Corners                        |
| A: Reason with  | A: Reason with shapes and their                                       | 3.G.A.2        | Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole.                                                                                                 | Shade Fractions                                |
| Geometry        | shapes and their attributes.                                            |                |                                                                                           |                                                 |</p>
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<tr>
<td>Operations &amp; Algebraic Thinking</td>
<td>A. Use the four operations with whole numbers to solve problems.</td>
<td>4.OA.1</td>
<td>Interpret a multiplication equation as a comparison. Represent verbal statements of multiplicative comparisons as multiplication equations.</td>
<td>Multiply and Divide Problems 1</td>
</tr>
<tr>
<td>Operations &amp; Algebraic Thinking</td>
<td>A. Use the four operations with whole numbers to solve problems.</td>
<td>4.OA.2</td>
<td>Multiply or divide to solve word problems involving multiplicative comparison.</td>
<td>Find the Missing Number 1</td>
</tr>
<tr>
<td>Operations &amp; Algebraic Thinking</td>
<td>A. Use the four operations with whole numbers to solve problems.</td>
<td>4.OA.3</td>
<td>Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.</td>
<td>Find the Missing Number 2</td>
</tr>
<tr>
<td>Operations &amp; Algebraic Thinking</td>
<td>B. Gain familiarity with factors and multiples.</td>
<td>4.OA.4</td>
<td>Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.</td>
<td>Multiples Factors</td>
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<tr>
<td>Operations &amp; Algebraic Thinking</td>
<td>C. Generate and analyze patterns.</td>
<td>4.OA.5</td>
<td>Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself.</td>
<td>Increasing Patterns</td>
</tr>
<tr>
<td>Number &amp; Operations in Base Ten</td>
<td>A. Generalize place value understanding for multi-digit whole numbers.</td>
<td>4.NBT.1</td>
<td>Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right.</td>
<td>Multiply Multiples of 10</td>
</tr>
<tr>
<td>Number &amp; Operations in Base Ten</td>
<td>A. Generalize place value understanding for multi-digit whole numbers.</td>
<td>4.NBT.2</td>
<td>Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using &gt;, =, and &lt; symbols to record the results of comparisons.</td>
<td>Numbers from Words to Digits 1 Numbers from Words to Digits 2 Greater Than or Less Than? Expanded Notation Expanding Numbers Place Value to Millions Place Value 3 Comparing Numbers</td>
</tr>
<tr>
<td>Number &amp; Operations in Base Ten</td>
<td>A. Generalize place value understanding for multi-digit whole numbers.</td>
<td>4.NBT.3</td>
<td>Use place value understanding to round multi-digit whole numbers to any place.</td>
<td>Rounding Numbers Nearest Thousand?</td>
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<td>Domain</td>
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<tr>
<td><strong>Number &amp; Operations in Base Ten</strong></td>
<td>B. Use place value understanding and properties of operations to perform multi-digit arithmetic.</td>
<td>4.NBT.B.4</td>
<td>Fluently add and subtract multi-digit whole numbers using the standard algorithm.</td>
<td>Add Two 2-Digit Numbers: Regroup</td>
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<td>Add 3-Digit Numbers: Regroup</td>
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<td>Add Multi-Digit Numbers 1</td>
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<td>Add Multi-Digit Numbers 2</td>
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<td>Adding Colossal Columns</td>
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<td>Subtracting Colossal Columns</td>
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<td>2-Digit Differences: Regroup</td>
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<td>3-Digit Differences: I Regrouping</td>
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<td>3-Digit Differences with Zeros</td>
</tr>
<tr>
<td><strong>Number &amp; Operations in Base Ten</strong></td>
<td>B. Use place value understanding and properties of operations to perform multi-digit arithmetic.</td>
<td>4.NBT.B.5</td>
<td>Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.</td>
<td>Multiply by 10, 100, 1000</td>
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<td>Multiply Multiples of 10</td>
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<td>Multiply 2 Digits Area Model</td>
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<td>Bar Model ++</td>
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<td>Contracted Multiplication</td>
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<td>Estimate Products</td>
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<td>Double and Halve to Multiply</td>
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<tr>
<td><strong>Number &amp; Operations in Base Ten</strong></td>
<td>B. Use place value understanding and properties of operations to perform multi-digit arithmetic.</td>
<td>4.NBT.B.6</td>
<td>Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.</td>
<td>Multiply 2 Digits Area Model</td>
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<td>Bar Model ++</td>
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<td>Dividing by 10, 100, 1000</td>
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<td>Remainders by Arrays</td>
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<td>Remainders by Tables</td>
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<td>Estimate Quotients</td>
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<td>Divide: 1-Digit Divisor 1</td>
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<td></td>
<td></td>
<td>Divide: 1-Digit Divisor 2</td>
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<tr>
<td><strong>Number &amp; Operations — Fractions</strong></td>
<td>A. Extend understanding of fraction equivalence and ordering.</td>
<td>4.NF.A.1</td>
<td>Explain why a fraction $\frac{a}{b}$ is equivalent to a fraction $(\frac{n}{n}) \left(\frac{a}{b}\right)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.</td>
<td>The Equivalent Fraction</td>
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<td>Equivalent Fraction Wall 1</td>
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<td>Simplifying Fractions</td>
</tr>
<tr>
<td><strong>Number &amp; Operations — Fractions</strong></td>
<td>A. Extend understanding of fraction equivalence and ordering.</td>
<td>4.NF.A.2</td>
<td>Compare two fractions with different numerators and different denominators. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols $&gt;$, $=$, or $&lt;$, and justify the conclusions.</td>
<td>Compare Fractions 1a</td>
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<td>Compare Fractions 1b</td>
</tr>
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</table>
| Number & Operations — Fractions | B. Build fractions from unit fractions.                                 | 4.NF.B.3   | Understand a fraction \( \frac{a}{b} \) with \( a > 1 \) as a sum of fractions \( \frac{1}{b} \).  
  a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.  
  b. Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions.
  c. Add and subtract mixed numbers with like denominators.
  d. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators. | Add subtract fractions 1  
Add like Mixed Numbers  
Subtract like Mixed Numbers |
| Number & Operations — Fractions | B. Build fractions from unit fractions.                                 | 4.NF.B.4   | Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.  
  a. Understand a fraction \( \frac{a}{b} \) as a multiple of \( \frac{1}{b} \).  
  b. Understand a multiple of \( \frac{a}{b} \) as a multiple of \( \frac{1}{b} \), and use this understanding to multiply a fraction by a whole number.
  c. Solve word problems involving multiplication of a fraction by a whole number. | Unit Fractions  
Model Whole Number Fractions  
Multiply Fraction Fruit Sets 2 |
| Number & Operations — Fractions | C. Understand decimal notation for fractions, and compare decimal fractions. | 4.NF.C.5   | Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. | Teacher directed                                |
| Number & Operations — Fractions | C. Understand decimal notation for fractions, and compare decimal fractions. | 4.NF.C.6   | Use decimal notation for fractions with denominators 10 or 100. | Decimals on the Number Line  
Measuring Length                                      |
| Number & Operations — Fractions | C. Understand decimal notation for fractions, and compare decimal fractions. | 4.NF.C.7   | Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when two decimals refer to the same whole. Record the results of comparisons with the symbols \( > \), \( = \), or \( < \), and justify the conclusions. | Comparing Decimals 1  
Decimal Order 1                                        |
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<th>Domain</th>
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<th>Standard Description</th>
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<tbody>
<tr>
<td>Measurement &amp;</td>
<td>A. Solve problems involving measurement and conversion of measurements.</td>
<td>4.MDA.1</td>
<td>Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table.</td>
<td>Inches, Feet, Yards Cups, Pints, Quarts, Gallons Customary Units of Length Customary Units of Capacity Customary Units of Weight 1 Customary Units of Weight 2 Meters and Kilometers Centimeters and Millimeters Milliliters and Liters Converting cm and mm Grams and Kilograms Conversions Time Conversions: Whole Numbers 1</td>
</tr>
<tr>
<td>Measurement &amp;</td>
<td>A. Solve problems involving measurement.</td>
<td>4.MDA.2</td>
<td>Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.</td>
<td>Perimeter: Squares and Rectangles Perimeter Detectives 1 Area: Squares and Rectangles</td>
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<tr>
<td>Data</td>
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<td></td>
<td>Teacher directed</td>
</tr>
<tr>
<td>Measurement &amp;</td>
<td>A. Solve problems involving measurement and conversion of measurements.</td>
<td>4.MDA.3</td>
<td>Apply the area and perimeter formulas for rectangles in real world and mathematical problems.</td>
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<tr>
<td>Data</td>
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<tr>
<td>Measurement &amp;</td>
<td>B. Represent and interpret data.</td>
<td>4.MD.B.4</td>
<td>Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots.</td>
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</table>
| Measurement & Data  |         | 4.MD.C.5 | Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:  
  a. An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a “one-degree angle,” and can be used to measure angles.  
  b. An angle that turns through n one-degree angles is said to have an angle measure of n degrees.                                                                                                                                                         | Comparing Angles  
  Equal Angles  
  Estimating Angles                                                                                           |
| Measurement & Data  |         | 4.MD.C.6 | Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.                                                                                                                                                                                                                                                        | Classifying Angles  
  What Type of Angle?  
  Measuring Angles                                                                                             |
| Measurement & Data  |         | 4.MD.C.7 | Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems.                                                      | Angles of Revolution: Unknown Values  
  Angles of Revolution: Value of x  
  Angle Measures in a Triangle                                                                                   |
| Geometry            | A.      | 4.G.A.1  | Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.                                                                                                                                                                                                     | Labelling Angles  
  What Line Am I?  
  Right Angle Relation  
  Triangles; Acute, Right, Obtuse  
  Sides, Angles and Diagonals                                                                                 |
| Geometry            | A.      | 4.G.A.2  | Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.                                                                                                                                  | Classifying Angles  
  Collect the Shapes 2 Shapes                                                                                   |
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<tr>
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<tbody>
<tr>
<td>Geometry</td>
<td>A. Draw and identify lines and angles, and classify shapes by properties of their lines and angles.</td>
<td>4.G.A.3</td>
<td>Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.</td>
<td>Symmetry or Not?</td>
</tr>
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<td>Domain</td>
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<td>Standard Description</td>
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<tr>
<td>Operations &amp; Algebraic Thinking</td>
<td>A. Write and interpret numerical expressions.</td>
<td>5.OA.A.1</td>
<td>Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.</td>
<td>Order of Operations 1</td>
</tr>
<tr>
<td>Operations &amp; Algebraic Thinking</td>
<td>A. Write and interpret numerical expressions.</td>
<td>5.OA.A.2</td>
<td>Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.</td>
<td>Multiply and Divide Problems 1</td>
</tr>
<tr>
<td>Operations &amp; Algebraic Thinking</td>
<td>B. Analyze patterns and relationships.</td>
<td>5.OA.B.3</td>
<td>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.</td>
<td>Fit the Conditions 1</td>
</tr>
<tr>
<td>Number &amp; Operations in Base Ten</td>
<td>A. Understand the place value system.</td>
<td>5.NBT.A.1</td>
<td>Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.</td>
<td>Place Value to Millions</td>
</tr>
<tr>
<td>Number &amp; Operations in Base Ten</td>
<td>A. Understand the place value system.</td>
<td>5.NBT.A.2</td>
<td>Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.</td>
<td>Multiply Decimals and Powers of 1</td>
</tr>
<tr>
<td>Number &amp; Operations in Base Ten</td>
<td>A. Understand the place value system.</td>
<td>5.NBT.A.3</td>
<td>Read, write, and compare decimals to thousandths. a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form. b. Compare two decimals to thousandths based on meanings of the digits in each place, using &gt;, =, and &lt; symbols to record the results of comparisons.</td>
<td>Decimal from Words to Digits 1</td>
</tr>
<tr>
<td>Number &amp; Operations in Base Ten</td>
<td>A. Understand the place value system.</td>
<td>5.NBT.A.4</td>
<td>Use place value understanding to round decimals to any place.</td>
<td>Rounding Decimals</td>
</tr>
<tr>
<td>Number &amp; Operations in Base Ten</td>
<td>B. Perform operations with multi-digit whole numbers and with decimals to hundredths.</td>
<td>5.NBT.B.5</td>
<td>Fluently multiply multi-digit whole numbers using a standard algorithm.</td>
<td>Multiply: 2-Digit Number, Regroup</td>
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<td>Domain</td>
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<tr>
<td>Number &amp; Operations in</td>
<td>B. Perform operations with multi-digit whole numbers and with decimals</td>
<td>5.NBT.B.6</td>
<td>Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.</td>
<td>Divide: 2-Digit Divisor, Remainder Mental Methods Division Mental Methods Division 1 Mental Methods Division 2 Estimate Quotients</td>
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<tr>
<td>Base Ten</td>
<td>to hundredths.</td>
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<tr>
<td>Number &amp; Operations in</td>
<td>B. Perform operations with multi-digit whole numbers and with decimals</td>
<td>5.NBT. B.7</td>
<td>Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.</td>
<td>Add Decimals 1 Subtract Decimals 1 Decimal by Whole Number Divide Decimal by Whole Number Estimate Decimal Operations Money Problems: Four Operations</td>
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<tr>
<td>Base Ten</td>
<td>to hundredths.</td>
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<tr>
<td>Number &amp; Operations —</td>
<td>A. Use equivalent fractions as a strategy to add and subtract fractions.</td>
<td>5.NF.A.1</td>
<td>Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.</td>
<td>Add Unlike Fractions Add Unlike Mixed Numbers Add: No Common Denominator Subtract Unlike Fractions Subtract Unlike Mixed Numbers</td>
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<td>Fractions</td>
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<tr>
<td>Number &amp; Operations —</td>
<td>A. Use equivalent fractions as a strategy to add and subtract fractions.</td>
<td>5.NF.A.2</td>
<td>Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.</td>
<td>Fraction Fruit Sets 2</td>
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<td>Fractions</td>
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<tr>
<td>Number &amp; Operations —</td>
<td>B. Apply and extend previous understandings of multiplication and division.</td>
<td>5.NF.B.3</td>
<td>Interpret a fraction as division of the numerator by the denominator ((a/b = a ÷ b)). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers.</td>
<td>Partition into Equal Parts</td>
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<tr>
<td>Number &amp; Operations —</td>
<td>B. Apply and extend previous understandings</td>
<td>5.NF.B.4</td>
<td>Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.</td>
<td>Model fractions to multiply</td>
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<tr>
<td>Fractions</td>
<td>of multiplication.</td>
<td></td>
<td>a. Interpret the product $(a/b) \times q$ as a parts of a partition of $q$ into $b$ equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$.</td>
<td>Multiply Fraction by Whole Number</td>
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<td>b. Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.</td>
<td>Multiply: Whole Number and Fraction</td>
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<td>Multiply Fraction by Fraction</td>
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<td>Multiply Two Fractions</td>
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<td>Fraction Wall Labelling</td>
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<td>Multiply Mixed Numbers</td>
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<td>5.NF.B.5</td>
<td>Interpret multiplication as scaling (resizing), by:</td>
<td>Teacher directed</td>
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<td>a. Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.</td>
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<td>b. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $\frac{a}{b} = \frac{(n \times a)}{(n \times b)}$ to the effect of multiplying $\frac{a}{b}$ by 1.</td>
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<tr>
<td>Number &amp; Operations —</td>
<td>B. Apply and extend previous understandings</td>
<td>5.NF.B.6</td>
<td>Solve real world problems involving multiplication of fractions and mixed numbers.</td>
<td>Estimate Products with Fractions</td>
</tr>
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<td>Fractions</td>
<td>of multiplication and division.</td>
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<td></td>
<td></td>
<td>5.NF.B.6</td>
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| Number & Operations — Fractions | B. Apply and extend previous understandings of multiplication and division. | 5.NF.B.7 | Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.  
  a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients.  
  b. Interpret division of a whole number by a unit fraction, and compute such quotients.  
  c. Solve real-world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions. | Divide Fractions Visual Model  
Divide by a Unit Fraction |
| Measurement & Data          | A. Convert like measurement units within a given measurement system.    | 5.MD.A.1 | Convert among different-sized standard measurement units within a given measurement system, and use these conversions in solving multi-step, real world problems.                                                                 | Converting Units of Length  
Customary Units of Length  
Operations with Length  
Meters and Kilometers  
Converting Units of Mass  
Customary Units of Weight 1  
Customary Units of Weight 2  
Mass Additions  
Milliliters and Liters  
Customary Units of Capacity  
Capacity Addition  
Mass Word Problems |
| Measurement & Data          | B. Represent and interpret data.                                       | 5.MD.B.2 | Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. | Teacher directed |
| Measurement & Data          | C. Geometric measurement understand concepts of volume.               | 5.MD.C.3 | Recognize volume as an attribute of solid figures and understand concepts of volume measurement.  
  a. A cube with side length 1 unit, called a “unit cube,” is said to have “one cubic unit” of volume and can be used to measure volume.  
  b. A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units. | Volume of Solids and Prisms - 1cm³ blocks |
| Measurement & Data          | C. Geometric measurement understand concepts of volume.               | 5.MD.C.4 | Measure volumes by counting unit cubes, using cubic cm, cubic in., cubic ft, and improvised units.                                                                                                                  | Volume of Solids and Prisms - 1cm³ blocks  
How many Blocks? |
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</table>
| Measurement & | C. Geometric measurement: understand concepts of volume. | 5.MD.C.5 | Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.  
  a. Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes.  
  b. Apply the formulas \( V = (l)(w)(h) \) and \( V = (b)(h) \) for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.  
  c. Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems. | Volume: Rectangular Prisms 1  
Volume: Rectangular Prisms 2 |
| Data          |                                                  |          |                                                                                                                                                                                                                     |                          |
| Geometry      | A. Graph points on the coordinate plane to solve real-world and mathematical problems. | 5.G.A.1  | Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond. | Coordinate Graphs: 1st Quadrant |
|              |                                                  | 5.G.A.2  | Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.                                                                                           |                          |
|              |                                                  | 5.G.A.3  | Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.                                                                                             | Sides, Angles and Diagonals  
Collect More Shapes  
Collect the Shapes 2  
Collect the Polygons  
Properties of Quadrilaterals |
<p>| | | | | |
|              |                                                  |          |                                                                                                                                                                                                                     |                          |</p>
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<tbody>
<tr>
<td>Geometry</td>
<td>B. Classify two-dimensional figures into categories based on their properties.</td>
<td>5.G.A.4</td>
<td>Classify two-dimensional figures in a hierarchy based on properties.</td>
<td>Teacher directed</td>
</tr>
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<td>Activities</td>
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</tr>
<tr>
<td>Ratios and Proportional</td>
<td>A. Understand ratio concepts and use ratio reasoning to solve problems.</td>
<td>6.RP.A.1</td>
<td>Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.</td>
<td>Ratio Word Problems</td>
</tr>
<tr>
<td>Relationships</td>
<td></td>
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<td>Solve Proportions</td>
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<td>Dividing a Quantity in a Ratio</td>
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<td>Simplify Ratios</td>
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<td>Equivalent Ratios</td>
</tr>
<tr>
<td>Ratios and Proportional</td>
<td>A. Understand ratio concepts and use ratio reasoning to solve problems.</td>
<td>6.RP.A.2</td>
<td>Understand the concept of a unit rate ( \frac{a}{b} ) associated with a ratio ( a : b ) where ( b \neq 0 ), and use rate language in the context of a ratio relationship.</td>
<td>Unitary Method</td>
</tr>
<tr>
<td>Relationships</td>
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<td>Rates</td>
</tr>
<tr>
<td>Ratios and Proportional</td>
<td>A. Understand ratio concepts and use ratio reasoning to solve problems.</td>
<td>6.RP.A.3</td>
<td>Use ratio and rate reasoning to solve real-world and mathematical problems. ( \text{a. Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.} ) ( \text{b. Solve unit rate problems including those involving unit pricing and constant speed.} )</td>
<td>Tables of Values</td>
</tr>
<tr>
<td>Relationships</td>
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<td>Reading Values from a Line</td>
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<td>Graphing from a Table of Values</td>
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<td>Rate Word Problems</td>
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<td>Average Speed</td>
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<td>Best Buy</td>
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<tr>
<td>Ratios and Proportional</td>
<td>A. Understand ratio concepts and use ratio reasoning to solve problems.</td>
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<td>Common Fractions as Percentages</td>
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<tr>
<td>Relationships</td>
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<td></td>
<td>Mixed decimal, percentage and fraction conversions</td>
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<td>Percentage of a Quantity</td>
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<td>Percentage Word Problems</td>
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<td>Percentage of an amount using fractions (&lt;100%)</td>
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<td>Solve Percent Equations</td>
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<td></td>
<td>Quantities to Percentages (with units)</td>
</tr>
<tr>
<td>Ratios and Proportional</td>
<td>A. Understand ratio concepts and use ratio reasoning to solve problems.</td>
<td></td>
<td></td>
<td>Centimeters and Millimeters</td>
</tr>
<tr>
<td>Relationships</td>
<td></td>
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<td>Converting cm and mm</td>
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<td>Converting Units of Area</td>
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<td>Customary Units of Length</td>
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<td>Customary Units of Capacity</td>
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<td>Customary Units of Weight 1</td>
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<td>Customary Units of Weight 2</td>
</tr>
<tr>
<td>The Number System</td>
<td>A. Apply and extend previous understandings of multiplication and</td>
<td>6.NS.A.1</td>
<td>Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions.</td>
<td>Divide by a Unit fraction</td>
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<td>division to divide fractions by fractions.</td>
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<td>Divide fractions visual model</td>
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<td>Divide Whole Number by Fraction</td>
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<td></td>
<td>Dividing Fractions</td>
</tr>
<tr>
<td>The Number System</td>
<td>B. Compute fluently with multi-digit numbers and find common factors</td>
<td>6.NS.B.2</td>
<td>Fluently divide multi-digit numbers using the standard algorithm.</td>
<td>Divide: 1-Digit Divisor 2</td>
</tr>
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<td></td>
<td>and multiples.</td>
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<td></td>
<td>Divide: 2-Digit Divisor, Remainder</td>
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### Grade 6

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<tbody>
<tr>
<td>The Number System</td>
<td>B. Compute fluently with multi-digit numbers and find common factors</td>
<td>6.NS.B.3</td>
<td>Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.</td>
<td>Adding Decimals, Subtracting Decimals, Multiply Decimals, Decimal by Decimal, Divide Decimal by Whole Number, Divide Decimal by Decimal</td>
</tr>
<tr>
<td></td>
<td>and multiples.</td>
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<tr>
<td>The Number System</td>
<td>B. Compute fluently with multi-digit numbers and find common factors</td>
<td>6.NS.B.4</td>
<td>Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor.</td>
<td>Greatest Common Factor, Least Common Multiple</td>
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<td>and multiples.</td>
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<tr>
<td>The Number System</td>
<td>C. Apply and extend previous understandings of numbers to the system of rational numbers.</td>
<td>6.NS.C.5</td>
<td>Understand that positive and negative numbers are used together to describe quantities having opposite directions or values; use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.</td>
<td>Negative or Positive?, Integers on a Number Line</td>
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</table>
| The Number System       | C. Apply and extend previous understandings of numbers to the system of rational numbers. | 6.NS.C.6   | Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.  
  a. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself.  
  b. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.  
  c. Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane. | Ordering Integers, Integers on a Number Line, Comparing Integers, Number Plane, Ordered Pairs, Vertical and horizontal shift |
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</table>
| The Number System      | C. Apply and extend previous understandings of numbers to the system of rational numbers. | 6.NS.C.7 | Understand ordering and absolute value of rational numbers.  
   a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram.   
   b. Write, interpret, and explain statements of order for rational numbers in real-world contexts.   
   c. Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation.   
   d. Distinguish comparisons of absolute value from statements about order. | Absolute Value                                   |
| The Number System      | C. Apply and extend previous understandings of numbers to the system of rational numbers. | 6.NS.C.8 | Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate. | Number Plane  
                         Ordered Pairs  
                         Graphing from a Table of Values  
                         Graphing from a Table of Values 2  
                         Vertical and horizontal shift |
| Expressions & Equations | A. Apply and extend previous understandings of arithmetic to algebraic expressions. | 6.EE.A.1 | Write and evaluate numerical expressions involving whole-number exponents. | Exponent Notation  
                         Properties of Exponents  
                         Exponent Laws and Algebra |
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<tr>
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<th>Standard</th>
<th>Standard description</th>
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</table>
| Expressions &   | A. Apply and extend previous understandings of arithmetic to algebraic   | 6.EE.A.2  | Write, read, and evaluate expressions in which letters stand for numbers.  
   Equations                                                                 |                                                                                                 | Writing Algebraic Expressions  
   Simple Substitution 1  
   Simple Substitution 2  
   Substitution in Formulae  
   Volume: Rectangular Prisms 2  
   Integers: Order of Operations  
   Order of Operations 2 (PEDMAS) |
|                 | expressions.                                                            |           | a. Write expressions that record operations with numbers and with letters standing for numbers.  
   b. Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity.  
   c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). |                                                                                                 |                                                                                                |
|                 |                                                                        |           |                                                                                                                                                                                                                       |                                                                                                |
| Expressions &   | A. Apply and extend previous understandings of arithmetic to algebraic   | 6.EE.A.3  | Apply the properties of operations to generate equivalent expressions.                                                                                                                                                  | Recognizing Like Terms  
   Like Terms: Add, Subtract                                                                 |                                                                                                |
| Equations       | expressions.                                                            |           |                                                                                                                                                                                                                       |                                                                                                |
|                 |                                                                        |           |                                                                                                                                                                                                                       |                                                                                                |
| Expressions &   | A. Apply and extend previous understandings of arithmetic to algebraic   | 6.EE.A.4  | Identify when two expressions are equivalent.                                                                                                                                                                         | Recognizing Like Terms                                                                                                                                   |                                                                                                |
| Equations       | expressions.                                                            |           |                                                                                                                                                                                                                       |                                                                                                |                                                                                                |
|                 |                                                                        |           |                                                                                                                                                                                                                       |                                                                                                |                                                                                                |
| Expressions &   | B. Reason about and solve one -variable equations and inequalities.     | 6.EE.B.5  | Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true. | Simple Substitution 1  
   Simple Substitution 2                                                                                                                                  |                                                                                                |
| Equations       |                                                                        |           |                                                                                                                                                                                                                       |                                                                                                |                                                                                                |
|                 |                                                                        |           |                                                                                                                                                                                                                       |                                                                                                |                                                                                                |
| Expressions &   | B. Reason about and solve one -variable equations and inequalities.     | 6.EE.B.6  | Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. | Teacher directed                                                                                                                                       |                                                                                                |
### Grade 6

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<tr>
<td>Expressions &amp; Equations &amp; Equations</td>
<td>B. Reason about and solve one-variable equations and inequalities.</td>
<td>6.EE.B.7</td>
<td>Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$; $x - p = q$; $px = q$; and $x/p = q$ for cases in which $p$, $q$, and $x$ are all nonnegative rational numbers, $p \neq 0$ and where $x$ represents the unknown quantity.</td>
<td>Write an Equation: Word Problems Solve Equations: Add, Subtract 1 Solve Equations: Add, Subtract 2 Solve Equations: Multiply, Divide 1 Solve Equations: Multiply, Divide 2 Solve Multi-Step Equations Solve Two-Step Equations</td>
</tr>
<tr>
<td>Expressions &amp; Equations</td>
<td>B. Reason about and solve one-variable equations and inequalities.</td>
<td>6.EE.B.8</td>
<td>Write an inequality of the form $x &gt; c$, $x \geq c$, $x \leq c$, or $x &lt; c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of these forms have infinitely many solutions; represent solutions of such inequalities on a number line.</td>
<td>Solve One-Step Inequalities 1 Solve One-Step Inequalities 2 Solve Two-Step Inequalities</td>
</tr>
<tr>
<td>Expressions &amp; Equations</td>
<td>C. Represent and analyze quantitative relationships between dependent and independent variables.</td>
<td>6.EE.C.9</td>
<td>Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.</td>
<td>Teacher directed</td>
</tr>
<tr>
<td>Geometry</td>
<td>A. Solve real-world and mathematical problems involving area, surface area, and volume.</td>
<td>6.G.A.1</td>
<td>Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.</td>
<td>Area: Parallelograms Area: Triangles Area: Squares and Rectangles Area: Quadrilaterals Area: Compound Figures</td>
</tr>
<tr>
<td>Geometry</td>
<td>A. Solve real-world and mathematical problems involving area, surface area, and volume.</td>
<td>6.G.A.2</td>
<td>Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = l w h$ and $V = b h$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.</td>
<td>Volume: Rectangular Prisms 2</td>
</tr>
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</thead>
<tbody>
<tr>
<td>Geometry</td>
<td>A. Solve real-world and mathematical problems involving area, surface area, and volume.</td>
<td>6.G.A.3</td>
<td>Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.</td>
<td>Rotations: Coordinate Plane</td>
</tr>
<tr>
<td>Geometry</td>
<td>A. Solve real-world and mathematical problems involving area, surface area, and volume.</td>
<td>6.G.A.4</td>
<td>Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.</td>
<td>Nets Surface Area: Rectangular Prisms Surface Area: Triangular Prisms Surface Area: Rectangular Pyramids</td>
</tr>
<tr>
<td>Statistics and Probability</td>
<td>A. Develop understanding of statistical variability.</td>
<td>6.SP.A.1</td>
<td>Recognizing that a statistical question is one that anticipates variability in the data related to the question and accounts for it in the answers.</td>
<td>Methods of Data Sampling</td>
</tr>
<tr>
<td>Statistics and Probability</td>
<td>A. Develop understanding of statistical variability.</td>
<td>6.SP.A.2</td>
<td>Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.</td>
<td>Data Terms</td>
</tr>
<tr>
<td>Statistics and Probability</td>
<td>A. Develop understanding of statistical variability.</td>
<td>6.SP.A.3</td>
<td>Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.</td>
<td>Data Terms</td>
</tr>
<tr>
<td>Statistics and Probability</td>
<td>B. Summarize and describe distributions.</td>
<td>6.SP.B.4</td>
<td>Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</td>
<td>Dot Plots Histograms Histograms for Grouped Data</td>
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<td>Domain</td>
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<td>Activities</td>
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</table>
| Statistics and Probability | B. Summarize and describe distributions. | 6.SP.B.5 | Summarize numerical data sets in relation to their context, such as by: a. Reporting the number of observations. b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement. c. Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered. d. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered. | Mode  
Median  
Mean  
Frequency Histograms  
Data Extremes and Range  
Mode from Frequency Table  
Median from Frequency  
Mean from Frequency Table  
Calculating Interquartile Range |
### Grade 7

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<tbody>
<tr>
<td>Ratios &amp; Proportional Relationships</td>
<td>A. Analyze proportional relationships and use them to solve real-world and mathematical problems.</td>
<td>7.RP.A.1</td>
<td>Compute unit rates associated with ratios of fractions, including ratios of lengths, areas, and other quantities measured in like or different units.</td>
<td>Proportional Relationships Rate Word Problems Rates Calculations Rates Solve Proportions Converting Rates Distance Traveled Average Speed Time Taken</td>
</tr>
</tbody>
</table>
| Ratios & Proportional Relationships       | A. Analyze proportional relationships and use them to solve real-world and mathematical problems. | 7.RP.A.2 | Recognize and represent proportional relationships between quantities.  
a. Decide whether two quantities are in a proportional relationship.  
b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.  
c. Represent a proportional relationship by equations.  
d. Explain what a point \((x, y)\) on the graph of a proportional relationship means in terms of the situation, with special attention to the point \((0, 0)\) and \((1, r)\) where \(r\) is the unit rate. | Best Buy Travel Graphs y=ax Conversion Graphs |
<table>
<thead>
<tr>
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</thead>
</table>
| The Number System   | A. Apply and extend previous understandings of operations with fractions | 7.NS.A.1 | Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.  
  a. Describe situations in which opposite quantities combine to make 0.  
  b. Understand $p + q$ as the number located a distance $|q|$ from $p$, in the positive or negative direction depending on whether $q$ is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.  
  c. Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.  
  d. Apply properties of operations as strategies to add and subtract rational numbers.                                                                                           | Negative or Positive?  
Integers: Add and Subtract  
More with Integers  
Add Integers  
Subtract Integers  
Adding Integers: Positive, Negative or Zero  
Add Mixed Numbers: Same Sign  
Add Mixed Numbers: Signs Can Differ  
Subtract Mixed Numbers: Signs Differ  
Subtract Negative Mixed Numbers |
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<tbody>
<tr>
<td>The Number System</td>
<td>A. Apply and extend previous understandings of operations with fractions.</td>
<td>7.NS.A.2</td>
<td>Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.</td>
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<td></td>
<td>a. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as ((-1)(-1) = 1) and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.</td>
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<td>b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If (p) and (q) are integers, then ((-p/q) = (-p)/q = p/(-q)). Interpret quotients of rational numbers by describing real-world contexts.</td>
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<td></td>
<td>c. Apply properties of operations as strategies to multiply and divide rational numbers.</td>
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<td></td>
<td>d. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.</td>
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<td>Integer: Multiplication and Division</td>
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<td>Multiplying and Dividing Integers</td>
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<td>Powers of Integers</td>
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<td>Multiply Two Fractions 2</td>
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<td>Divide Fractions by Fractions 2</td>
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<td>Operations with Fractions</td>
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<td>Divide Mixed Numbers with Signs</td>
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<td></td>
<td></td>
<td>Fractions to Decimals 2</td>
<td></td>
</tr>
<tr>
<td>Expressions, Equations, and Inequalities</td>
<td>A. Use properties of operations to generate equivalent expressions.</td>
<td>7.EE.A.1</td>
<td>Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.</td>
<td></td>
</tr>
<tr>
<td>Expressions, Equations, and Inequalities</td>
<td>A. Use properties of operations to generate equivalent expressions.</td>
<td>7.EE.A.2</td>
<td>Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related.</td>
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<tbody>
<tr>
<td>Expressions, Equations, and Inequalities</td>
<td>B. Solve real-life and mathematical problems using numerical and algebraic expressions and equations.</td>
<td>7.EE.B.3</td>
<td>Solve multi-step real-world and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.</td>
<td>Purchase Options&lt;br&gt; Fraction Word Problems&lt;br&gt; More Fraction Problems&lt;br&gt; What Percentage?&lt;br&gt; Percentage Change: Increase and Decrease&lt;br&gt; Percent Increase and Decrease&lt;br&gt; Solve Percent Equations&lt;br&gt; Percentage Word Problems&lt;br&gt; Successive Discounts&lt;br&gt; Profit and Loss</td>
</tr>
</tbody>
</table>
| Expressions, Equations, and Inequalities   | B. Solve real-life and mathematical problems using numerical and algebraic expressions and equations. | 7.EE.B.4 | Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.  
  a. Solve word problems leading to equations of the form \( px + q = r \) and \( p(x + q) = r \), where \( p, q \) and \( r \) are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach.  
  b. Solve word problems leading to inequalities of the form \( px + q > r \) or \( px + q < r \), where \( p, q \) and \( r \) are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. | I am Thinking of a Number!<br> Solve Equations: Add, Subtract 1<br> Solve Equations: Add, Subtract 2<br> Solve Equations: Multiply, Divide 2<br> Solving Simple Equations<br> Solve Two-Step Equations<br> Solve One-Step Inequalities 1<br> Solve One-Step Inequalities 2 |
| Geometry                                   | A. Draw, construct and describe geometrical figures and describe the relationships between them. | 7.G.A.1  | Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.                                                                 | Scale Factor<br> Scale Measurement<br> Floor Plans<br> Perimeter, Area, Dimension Change |
| Geometry                                   | A. Draw, construct and describe geometrical figures and describe the relationships between them. | 7.G.A.2  | Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle. | Teacher directed |
## Grade 7

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<tbody>
<tr>
<td>Geometry</td>
<td>A. Draw, construct and describe geometrical figures and describe the relationships between them.</td>
<td>7.G.A.3</td>
<td>Describe the two-dimensional shapes that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.</td>
<td>Teacher directed</td>
</tr>
<tr>
<td>Geometry</td>
<td>B. Solve real-life and mathematical problems involving angle measure, area, surface area and volume.</td>
<td>7.G.B.4</td>
<td>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.</td>
<td>Calculate Circumference of Circles Area: Circles 1 Area: Circles 2 Area: Annulus</td>
</tr>
<tr>
<td>Geometry</td>
<td>B. Solve real-life and mathematical problems involving angle measure, area, surface area and volume.</td>
<td>7.G.B.5</td>
<td>Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.</td>
<td>Equal, Complement, or Supplement? Vertically Opposite: Value of x</td>
</tr>
<tr>
<td>Geometry</td>
<td>B. Solve real-life and mathematical problems involving angle measure, area, surface area and volume.</td>
<td>7.G.B.6</td>
<td>Solve real-world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed or triangles, quadrilaterals, polygons, cubes and right prisms.</td>
<td>Area of Squares and Rectangles Area: Compound Figures Area of Triangles Area: Composite Shapes Area: Parallelograms Area of Quadrilaterals Surface Area: Rectangular Prisms Surface Area: Triangular Prisms 1 Volume of Rectangular Prisms 1 Volume of Triangular Prisms Volume: Prisms</td>
</tr>
<tr>
<td>Statistics &amp; Probability</td>
<td>A. Use random sampling to draw inferences about a population.</td>
<td>7.SP.A.1</td>
<td>Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.</td>
<td>Teacher directed</td>
</tr>
<tr>
<td>Statistics &amp; Probability</td>
<td>A. Use random sampling to draw inferences about a population.</td>
<td>7.SP.A.2</td>
<td>Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.</td>
<td>Teacher directed</td>
</tr>
<tr>
<td>Statistics &amp; Probability</td>
<td>B. Draw informal comparative inferences about two populations.</td>
<td>7.SP.B.3</td>
<td>Informally assess the degree of visual overlap of two quantitative data distributions.</td>
<td>Teacher directed</td>
</tr>
<tr>
<td>Domain</td>
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</tr>
<tr>
<td>Statistics &amp; Probability</td>
<td>B. Draw informal comparative inferences about two populations.</td>
<td>7.SP.B.4</td>
<td>Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations.</td>
<td>Teacher directed</td>
</tr>
<tr>
<td>Statistics &amp; Probability</td>
<td>C. Investigate chance processes and develop, use, and evaluate probability models.</td>
<td>7.SP.C.5</td>
<td>Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.</td>
<td>Chance Dial Relative Frequency</td>
</tr>
<tr>
<td>Statistics &amp; Probability</td>
<td>C. Investigate chance processes and develop, use, and evaluate probability models.</td>
<td>7.SP.C.6</td>
<td>Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.</td>
<td>Find the Probability Simple Probability</td>
</tr>
<tr>
<td>Statistics &amp; Probability</td>
<td>C. Investigate chance processes and develop, use, and evaluate probability models.</td>
<td>7.SP.C.7</td>
<td>Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. a. Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. b. Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.</td>
<td>Probability Tables</td>
</tr>
</tbody>
</table>
### Grade 7

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</table>
| Statistics & Probability | Investigate chance processes and develop, use, and evaluate probability models. | 7.SP.C.8 | Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.  
   a. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.  
   b. Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language, identify the outcomes in the sample space which compose the event.  
   c. Design and use a simulation to generate frequencies for compound events.  | Counting Principle  
   Counting Techniques I  
   Dice and Coins  
   Probability- Replacement |
## Grade 8

<table>
<thead>
<tr>
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<th>Standard Description</th>
<th>Activities</th>
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<tbody>
<tr>
<td>The Number System</td>
<td>A. Know that there are numbers that are not rational, and approximate them by rational numbers.</td>
<td>8.NS.A.1</td>
<td>Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.</td>
<td>Recurring Decimals, Estimate Square Roots, Simplifying Irrational Numbers, Multiplying Irrational Numbers, Dividing Irrational Numbers, Adding and Subtracting Irrational Numbers</td>
</tr>
<tr>
<td>The Number System</td>
<td>A. Know that there are numbers that are not rational, and approximate them by rational numbers.</td>
<td>8.NS.A.2</td>
<td>Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions.</td>
<td>Simplifying Irrational Numbers, Ordering Scientific Notation</td>
</tr>
<tr>
<td>Expressions &amp; Equations</td>
<td>A. Work with radicals and integer exponents.</td>
<td>8.EE.A.1</td>
<td>Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, (3^2 \times 3^{-5} = 1/(3^3) = 1/27).</td>
<td>Algebraic Multiplication, Zero Exponent and Algebra, The Zero Exponent, Simplifying with Exponential Laws 2, Multiplication with Exponents, Fractional Exponents, Properties of Exponents, Exponents, Exponent Notation and Algebra, Powers of Integers, Powers and Patterns, Rationalising and Binomials</td>
</tr>
<tr>
<td>Expressions &amp; Equations</td>
<td>A. Work with radicals and integer exponents.</td>
<td>8.EE.A.2</td>
<td>Use square root 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. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that (\sqrt{2}) is irrational.</td>
<td>Estimate Square Roots, Square and Cube Roots, Estimating Cube Roots, Square Roots</td>
</tr>
<tr>
<td>Expressions &amp; Equations</td>
<td>A. Work with radicals and integer exponents.</td>
<td>8.EE.A.3</td>
<td>Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other.</td>
<td>Scientific Notation, Scientific Notation 1, Scientific Notation 2, Scientific notation to decimal, Ordering Scientific Notation</td>
</tr>
<tr>
<td>Expressions &amp; Equations</td>
<td>A. Work with radicals and integer exponents.</td>
<td>8.EE.A.4</td>
<td>Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities. Interpret scientific notation that has been generated by technology.</td>
<td>Ordering Scientific Notation</td>
</tr>
</tbody>
</table>
**Domain** | **Cluster** | **Standard** | **Standard Description** | **Activities**
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Expressions & Equations | 8. Understand the connections between proportional relationships, lines, and linear equations. | 8.EE.B.5 | Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. | Direct Variation
Indirect Variation
Modeling Linear Relationships

| Expressions & Equations | 8. Understand the connections between proportional relationships, lines, and linear equations. | 8.EE.B.6 | Use similar triangles to explain why the slope \( m \) is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equations \( y = mx \) for a line through the origin and the equations \( y = mx + b \) for a line intercepting the vertical axis at \( b \). | Teacher directed

| Expressions & Equations | C. Analyze and solve linear equations and pairs of simultaneous linear equations. | 8.EE.C.7 | Solve linear equations in one variable.  
   a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form \( x = a, \ a = a, \) or \( a = b \) results (where \( a \) and \( b \) are different numbers).  
   b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and combining like terms. | Equations with Grouping Symbols
Equations with Fractions
Equations with Fractions 2
Equations to Solve Problems
Modelling Linear Relationships
Expanding Binomial Irrational Numbers
Expanding Irrational Number Expressions
Special Binomial Products |
<table>
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</thead>
</table>
| Expressions & Equations| C. Analyze and solve linear equations and pairs of simultaneous linear equations. | 8.EE.C.8 | Analyze and solve pairs of simultaneous linear equations.  
  a. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.  
  b. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection.  
  c. Solve real-world and mathematical problems leading to two linear equations in two variables. | Simultaneous Equations 1  
 Simultaneous Equations 2  
 Simultaneous Linear Equations  
 Modelling Linear Relationships |
| Functions              | A. Define, evaluate, and compare functions.                           | 8.F.A.1  | Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. | Find the Function Rule  
 Ordered Pairs  
 Graphing from a Table of Values  
 Determining a Rule for a Line  
 Function Rules and Tables |
| Functions              | A. Define, evaluate, and compare functions.                           | 8.F.A.2  | Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). | Ordered Pairs  
 Graphing from a Table of Values  
 Determining a Rule for a Line  
 Function Rules and Tables |
| Functions              | A. Define, evaluate, and compare functions.                           | 8.F.A.3  | Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. | Reading Values from a Line  
 Gradient  
 Slope of a Line  
 Equation of a Line 1  
 Equation of a Line 2  
 Which Straight Line? |
| Functions              | B. Use functions to model relationships between quantities.            | 8.F.B.4  | Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two $(x, y)$ values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values. | Equation of a Line 1  
 Equation of a Line 2  
 Equation of a Line 3  
 Equation from Point and Gradient |
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<tr>
<td>Functions</td>
<td>B. Use functions to model relationships between quantities.</td>
<td>8.F.B.5</td>
<td>Describe qualitatively the functional relationship between two quantities by analyzing a graph. Sketch a graph that exhibits the qualitative features of a function that has been described verbally.</td>
<td>Conversion Graphs</td>
</tr>
<tr>
<td>Geometry</td>
<td>A. Understand congruence and similarity using physical models, transparencies, or geometry software.</td>
<td>8.G.A.1</td>
<td>Verify experimentally the properties of rotations, reflections, and translations: a. Lines are taken to lines, and line segments to line segments of the same length. b. Angles are taken to angles of the same measure. c. Parallel lines are taken to parallel lines.</td>
<td>Angles and Parallel Lines Angles on Parallel Lines Introduction to Angles on Parallel Lines 1 Introduction to Angles on Parallel Lines 3 Are the Lines Parallel? Are they Parallel? Parallel Lines Vertically Opposite Angles: Unknown Values Vertically Opposite: Value of x</td>
</tr>
<tr>
<td>Geometry</td>
<td>A. Understand congruence and similarity using physical models, transparencies, or geometry software.</td>
<td>8.G.A.2</td>
<td>Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.</td>
<td>Congruent Triangles Congruent Figures Congruent Figures: Find Values</td>
</tr>
<tr>
<td>Geometry</td>
<td>A. Understand congruence and similarity using physical models, transparencies, or geometry software.</td>
<td>8.G.A.3</td>
<td>Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.</td>
<td>Flip, Slide, Turn Transformations Transformations: Coordinate Plane Rotations: Coordinate Plane</td>
</tr>
<tr>
<td>Geometry</td>
<td>A. Understand congruence and similarity using physical models, transparencies, or geometry software.</td>
<td>8.G.A.4</td>
<td>Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.</td>
<td>Similar Figures Similarity Proofs Using Similar Triangles</td>
</tr>
<tr>
<td>Geometry</td>
<td>A. Understand congruence and similarity using physical models, transparencies, or geometry software.</td>
<td>8.G.A.5</td>
<td>Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.</td>
<td>Angle Measures in a Triangle Exterior Angles of a Triangle</td>
</tr>
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<tr>
<td>Geometry</td>
<td>B. Understand and apply the Pythagorean Theorem.</td>
<td>8.G.B.6</td>
<td>Explain a proof of the Pythagorean Theorem and its converse.</td>
<td>Pythagorean Triads</td>
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<td>Pythagorean Theorem</td>
</tr>
<tr>
<td>Geometry</td>
<td>B. Understand and apply the Pythagorean Theorem.</td>
<td>8.G.B.7</td>
<td>Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.</td>
<td>Pythagoras and Perimeter</td>
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<td>Pythagoras: Find a Short Side (decimal values)</td>
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<td></td>
<td>Pythagoras: Find a Short Side (integers only)</td>
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<td></td>
<td>Pythagoras: Find a Short Side (rounding needed)</td>
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<td>Find Slant Height</td>
</tr>
<tr>
<td>Geometry</td>
<td>B. Understand and apply the Pythagorean Theorem.</td>
<td>8.G.B.8</td>
<td>Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.</td>
<td>Distance Between Two Points</td>
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<td>Volume: Cylinders</td>
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<td>Volume: Cones</td>
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<td>Volume: Composite Figures</td>
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<tr>
<td>Statistics &amp;</td>
<td>A. Investigate patterns of association in bivariate data.</td>
<td>8.SP.A.1</td>
<td>Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.</td>
<td>Scatter Plots</td>
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<td>Data Analysis: Scatter Plots</td>
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<tr>
<td>Statistics &amp;</td>
<td>A. Investigate patterns of association in bivariate data.</td>
<td>8.SP.A.2</td>
<td>Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.</td>
<td>Correlation</td>
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<td>Probability</td>
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<td>Data Analysis: Scatter Plots</td>
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<tr>
<td></td>
<td>A. Investigate patterns of association in bivariate data.</td>
<td>8.SP.A.3</td>
<td>Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.</td>
<td>Direct Variation</td>
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<td>Standard Description</td>
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<tr>
<td>Statistics &amp; Probability</td>
<td>A. Investigate patterns of association in bivariate data.</td>
<td>8.SP.A.4</td>
<td>Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated from rows or columns to describe possible association between the two variables.</td>
<td>Teacher directed</td>
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</table>
### CCSS Algebra I

**Conceptual Category: Number and Quantity**

<table>
<thead>
<tr>
<th>Domain</th>
<th>Cluster</th>
<th>Standard</th>
<th>Description</th>
<th>Topic</th>
<th>Activities</th>
<th>eBooks</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Real Number System</td>
<td>Extend the properties of exponents to rational exponents.</td>
<td>N.RN.1</td>
<td>Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. For example, we define (5^{1/3}) to be the cube root of 5 because we want ((5^{1/3})^3 = 5^{(1/3)\times3}) to hold, so ((5^{1/3})^3) must equal 5.</td>
<td>Exponents</td>
<td>Exponent Laws and Algebra Exponent Notation and Algebra Simplifying with Exponent Laws 2 Fractional Exponents Irrational Number to Exponent Form Zero Exponent and Algebra</td>
<td>Designs and Exponents</td>
</tr>
<tr>
<td>The Real Number System</td>
<td>Extend the properties of exponents to rational exponents.</td>
<td>N.RN.2</td>
<td>Rewrite expressions involving radicals and rational exponents using the properties of exponents.</td>
<td>Exponents</td>
<td>Fractional Exponents Irrational Number to Exponent Form Zero Exponents and Algebra Simplifying with Exponent Laws 1 Multiplication with Exponents Exponent Laws and Algebra Exponent Laws with Brackets</td>
<td>Grade 8 Pythagoras’ Theorem</td>
</tr>
<tr>
<td>The Real Number System</td>
<td>Use properties of rational and irrational numbers.</td>
<td>N.RN.3</td>
<td>Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.</td>
<td>Irrational Numbers</td>
<td>Adding and Subtracting Irrational Numbers Multiplying Irrational Numbers Expanding Binomial Irrational Numbers</td>
<td>Under review</td>
</tr>
<tr>
<td>Quantities</td>
<td>Reason quantitatively and use units to solve problems.</td>
<td>N.Q.1</td>
<td>Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</td>
<td>Under review</td>
<td>Under Consideration</td>
<td>Under review</td>
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</table>
## CCSS Algebra I

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<tr>
<td>Quantities</td>
<td>Reason quantitatively and use units to solve problems.</td>
<td>N.Q.2</td>
<td>Define appropriate quantities for the purpose of descriptive modeling.</td>
<td>Under review</td>
<td>Under Consideration</td>
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<tr>
<td>Quantities</td>
<td>Reason quantitatively and use units to solve problems.</td>
<td>N.Q.3</td>
<td>Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</td>
<td>Quantities and Solving Linear Equations</td>
<td>Error in Measurement Percentage Error</td>
<td>Decimals</td>
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<td><strong>Conceptual Category: Algebra</strong></td>
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<tr>
<td>Seeing Structure in Expressions</td>
<td>Interpret the structure of expressions.</td>
<td>A.SSE.1.a</td>
<td>Interpret expressions that represent a quantity in terms of its context. Interpret parts of an expression, such as terms, factors, and coefficients.</td>
<td>Linear Expressions and Equations</td>
<td>Gradients for Real Write an Equation: Word Problems</td>
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<td>Quadratic Equations and Inequalities</td>
<td>Vertex of a Parabola</td>
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<td>Exponents</td>
<td>Compound Interest Compounded Interest by Formula Depreciation Declining Balance Depreciation</td>
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<td>Quadratic Equations and Inequalities</td>
<td>The Discriminant Constructing Formulae</td>
<td>Under review</td>
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<td></td>
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<td></td>
<td></td>
<td>A.SSE.2</td>
<td>Factoring Quadratics 1 Factoring Quadratics 2 Grouping in Pairs</td>
<td>Expanding and Factorizing</td>
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## CCSS Algebra I

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<tbody>
<tr>
<td>Seeing Structure in Expressions</td>
<td>Write expressions in equivalent forms to solve problems.</td>
<td>A.SSE.3.a</td>
<td>Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. Factor a quadratic expression to reveal the zeros of the function it defines.</td>
<td>Quadratic Equations and Inequalities</td>
<td>Highest Common Algebraic Factor</td>
<td>Under review</td>
</tr>
<tr>
<td>Seeing Structure in Expressions</td>
<td>Write expressions in equivalent forms to solve problems.</td>
<td>A.SSE.3.b</td>
<td>Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.</td>
<td>Quadratic Equations and Inequalities</td>
<td>Completing the Square</td>
<td>Under review</td>
</tr>
<tr>
<td>Seeing Structure in Expressions</td>
<td>Write expressions in equivalent forms to solve problems.</td>
<td>A.SSE.3.c</td>
<td>Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. Use the properties of exponents to transform expressions for exponential functions. <em>For example the expression</em> (1.15^t) <em>can be rewritten as</em> ((1.15^{1/12})^{12r} \approx 1.012^{12r}) <em>to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.</em></td>
<td>Under review</td>
<td>Under Consideration</td>
<td>Under review</td>
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<tr>
<td>Arithmetic with Polynomials and Rational Expressions</td>
<td>Perform arithmetic operations on polynomials.</td>
<td>A.APR.1</td>
<td>Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.</td>
<td>Add, Subtract, and Multiply Polynomials</td>
<td>Like Terms: Add and Subtract</td>
<td>Expanding and Factorizing</td>
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</table>
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<tr>
<td>Creating Equations</td>
<td>Create equations that describe numbers or relationships.</td>
<td>A.CED.1</td>
<td>Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions.</td>
<td>Linear Expressions and Equations</td>
<td>Writing Algebraic Expressions</td>
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<td>Equations to Solve Problems</td>
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<td>Depreciation Interest</td>
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<tr>
<td>Creating Equations</td>
<td>Create equations that describe numbers or relationships.</td>
<td>A.CED.2</td>
<td>Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</td>
<td>Linear Expressions and Equations</td>
<td>Equation from Point and Gradient</td>
<td>Linear Relationships</td>
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<td>Equation from Two Points</td>
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## CCSS Algebra I

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<th>Activities</th>
<th>eBooks</th>
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<tbody>
<tr>
<td></td>
<td>Creating Equations</td>
<td>A.CED.4</td>
<td>Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm’s law ( V = IR ) to highlight resistance ( R ).</td>
<td>Quantities and Solving Linear Equations</td>
<td>Changing the Subject</td>
<td>Linear Relationships Depreciation</td>
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<td></td>
<td>Reasoning with Equations and Inequalities</td>
<td>A.REI.1</td>
<td>Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.</td>
<td>Quantities and Solving Linear Equations</td>
<td>Find the Mistake Addition Properties Multiplication Properties Using the Distributive Property</td>
<td>Equations Quadratic Equations</td>
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<td>Solve One-Step Inequalities 1 Solve One-Step Inequalities 2 Solve Two-Step Inequalities Solving Inequalities 1 Solving Inequalities 2 Solving Inequalities 3 Graphing Inequalities 1 Graphing Inequalities 2 Graphing Inequalities 3</td>
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<td>Quadratic Equations and Inequalities</td>
<td>Quadratic Equations</td>
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<td></td>
<td>Sow quadratic equations in one variable. Use the method of completing the square to transform any quadratic equation in ( x ) into an equation of the form ((x - p)^2 = q) that has the same solutions. Derive the quadratic formula from this form.</td>
<td>Quadratic Equations 1 Quadratic Equations 2 Roots of the Quadratic</td>
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</table>
## CCSS Algebra I

### Conceptual Category: Algebra

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</thead>
<tbody>
<tr>
<td>Reasoning with Equations and Inequalities</td>
<td>Solve equations and inequalities in one variable.</td>
<td>A.REI.4.b</td>
<td>Solve quadratic equations in one variable. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers $a$ and $b$.</td>
<td>Quadratic Equations and Inequalities</td>
<td>Quadratic Equations 1 Quadratic Equations 2 Quadratic Formula The Discriminant Grouping in Pairs Quadratic Inequalities</td>
<td>Equations and Inequalities Factorizing Quadratic Equations</td>
</tr>
<tr>
<td>Reasoning with Equations and Inequalities</td>
<td>Solve systems of equations.</td>
<td>A.REI.5</td>
<td>Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.</td>
<td>Under review</td>
<td>Under Consideration</td>
<td>Equations and Inequalities</td>
</tr>
<tr>
<td>Reasoning with Equations and Inequalities</td>
<td>Solve systems of equations.</td>
<td>A.REI.6</td>
<td>Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.</td>
<td>Systems of Linear Equations</td>
<td>Solve Systems by Graphing Are they Parallel? Simultaneous Linear Equations Breakeven Point Simultaneous Equations 1 Simultaneous Equations 2</td>
<td>Equations and Inequalities</td>
</tr>
<tr>
<td>Reasoning with Equations and Inequalities</td>
<td>Solve systems of equations.</td>
<td>A.REI.7</td>
<td>Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line $y = -3x$ and the circle $x^2 + y^2 = 3$.</td>
<td>Linear and Quadratic Systems</td>
<td>Intersection: Line &amp; Parabola Simultaneous Equations 3 Intersection: Line &amp; Circle</td>
<td>Quadratic Equations</td>
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<tr>
<td>Reasoning with Equations and Inequalities</td>
<td>Represent and solve equations and inequalities graphically.</td>
<td>A.REI.10</td>
<td>Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).</td>
<td>Linear Expressions and Equations</td>
<td>Reading Values from a Line</td>
<td>Under review</td>
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<tr>
<td>Domain</td>
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<tr>
<td>Conceptual Category: Algebra</td>
<td>Reasoning with Equations and Inequalities</td>
<td></td>
<td>Explain why the (x)-coordinates of the points where the graphs of the equations (y = f(x)) and (y = g(x)) intersect are the solutions of the equation (f(x) = g(x)); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where (f(x)) and/or (g(x)) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.</td>
<td>Under review</td>
<td>Under Consideration</td>
<td>Under review</td>
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<tr>
<td></td>
<td>Reasoning with Equations and Inequalities</td>
<td></td>
<td>Graph the solutions to a linear inequality in two variables as a halfplane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.</td>
<td>Linear Inequalities</td>
<td>Linear Regions</td>
<td>Linear Regions</td>
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<tr>
<td>Conceptual Category: Functions</td>
<td>Interpreting Functions</td>
<td></td>
<td>Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If (f) is a function and (x) is an element of its domain, then (f(x)) denotes the output of (f) corresponding to the input (x). The graph of (f) is the graph of the equation (y = f(x)).</td>
<td>Functions</td>
<td>Function Rules and Tables</td>
<td>Functions</td>
</tr>
<tr>
<td></td>
<td>Interpreting Functions</td>
<td></td>
<td>Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.</td>
<td>Functions</td>
<td>Function Notation 1</td>
<td>Function Notation 3</td>
</tr>
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## CCSS Standards Alignment with Mathletics

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<tbody>
<tr>
<td><strong>Interpreting Functions</strong></td>
<td>Understand the concept of a function and use function notation.</td>
<td>F.IF.3</td>
<td>Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. For example, the Fibonacci sequence is defined recursively by ( f(0) = f(1) = 1 ), ( f(n+1) = f(n) + f(n-1) ) for ( n \geq 1 ).</td>
<td>Arithmetic and Geometric Sequences</td>
<td>Table of Values Terms: Arithmetic Progressions Terms: Geometric Progressions 1 Terms: Geometric Progressions 2</td>
<td>Sequences &amp; Series: Arithmetic Sequences &amp; Series: Geometric</td>
</tr>
<tr>
<td><strong>Interpreting Functions</strong></td>
<td>Interpret functions that arise in applications in terms of a context.</td>
<td>F.IF.4</td>
<td>For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.</td>
<td>Linear Expressions and Equations</td>
<td>Intercepts Slope of a Line ( y=ax ) Gradients for Real</td>
<td>Linear Relationships</td>
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<tr>
<td><strong>Interpreting Functions</strong></td>
<td>Interpret functions that arise in applications in terms of a context.</td>
<td>F.IF.5</td>
<td>Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function ( h(n) ) gives the number of person-hours it takes to assemble ( n ) engines in a factory, then the positive integers would be an appropriate domain for the function.</td>
<td>Under review</td>
<td>Under Consideration</td>
<td>Functions</td>
</tr>
<tr>
<td><strong>Interpreting Functions</strong></td>
<td>Interpret functions that arise in applications in terms of the context.</td>
<td>F.IF.6</td>
<td>Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.</td>
<td>Linear Expressions and Equations</td>
<td>Equation from Two Points</td>
<td>Under review</td>
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### Conceptual Category: Functions

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<td>F.IF.7.a</td>
<td>Graph functions expressed symbolically and show key features of the graph,</td>
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<td>by hand in simple cases and using technology for more complicated cases.</td>
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<td>Graphing from a Table of Values 2</td>
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<td></td>
<td>Graph linear and quadratic functions and show intercepts, maxima, and</td>
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<td>Which Straight Line?</td>
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<tr>
<td>Interpreting</td>
<td>Functions</td>
<td>F.IF.7.b</td>
<td>Graph functions expressed symbolically and show key features of the graph,</td>
<td>Absolute Value, Step, and</td>
<td>Absolute Value Expressions</td>
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<td>by hand in simple cases and using technology for more complicated cases.</td>
<td>Piecewise</td>
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<td>Graph square root, cube root, and piecewise-defined functions, including step</td>
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<td>Absolute Value Graphs</td>
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<td>Interpreting</td>
<td>Functions</td>
<td>F.IF.7.e</td>
<td>Graph functions expressed symbolically and show key features of the graph,</td>
<td>Exponents</td>
<td>Graphing Exponentials</td>
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<td>by hand in simple cases and using technology for more complicated cases.</td>
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<td>Graph exponential and logarithmic functions, showing intercepts and end</td>
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<td>behavior, and trigonometric functions, showing period, midline, and</td>
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<td>amplitude.</td>
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<td>Interpreting</td>
<td>Functions</td>
<td>F.IF.8.a</td>
<td>Write a function defined by an expression in different but equivalent</td>
<td>Quadratic Equations and</td>
<td>Factoring Quadratics 1</td>
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<td></td>
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<td>forms to reveal and explain different properties of the function.</td>
<td>Inequalities</td>
<td>Factoring Quadratics 2</td>
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<td></td>
<td></td>
<td></td>
<td>Use the process of factoring and completing the square in a quadratic</td>
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<td>Grouping in Pairs</td>
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<td>function to show zeros, extreme values, and symmetry of the graph, and</td>
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<td>Completing the Square</td>
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<td></td>
<td></td>
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<td>interpret these in terms of a context.</td>
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<td>Completing the Square 2</td>
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<td>Vertex of a Parabola</td>
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<tr>
<td><strong>Interpreting Functions</strong></td>
<td></td>
<td>F.IF.8.b</td>
<td>Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as $y = (1.02)^t$, $y = (0.97)^t$, $y = (1.01)^{2t}$, $y = (1.2)^{\frac{t}{10}}$, and classify them as representing exponential growth or decay.</td>
<td>Exponents</td>
<td>Multiplication with Exponents</td>
<td>Under review</td>
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<tr>
<td><strong>Interpreting Functions</strong></td>
<td></td>
<td>F.IF.9</td>
<td>Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.</td>
<td>Under review</td>
<td>Under Consideration</td>
<td>Linear Relationships Exponential and Power Graphs</td>
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<tr>
<td><strong>Building Functions</strong></td>
<td></td>
<td>F.BF.1.a</td>
<td>Write a function that describes a relationship between two quantities. Determine an explicit expression, a recursive process, or steps for calculation from a context.</td>
<td>Linear Expressions and Equations</td>
<td>Modeling Linear Relationships</td>
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## CCSS Standards

### Alignment with Mathletics

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<tbody>
<tr>
<td>Building Functions</td>
<td></td>
<td>F.BF.1.b</td>
<td>Write a function that describes a relationship between two quantities. Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.</td>
<td>Under review</td>
<td>Under Consideration</td>
<td>Under review</td>
</tr>
<tr>
<td>Building Functions</td>
<td></td>
<td>F.BF.2</td>
<td>Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.</td>
<td>Arithmetic and Geometric Sequences</td>
<td>Table of Values Terms: Arithmetic Progressions Terms: Geometric Progressions 1 Terms: Geometric Progressions 2</td>
<td>Sequences &amp; Series: Arithmetic Sequences &amp; Series: Geometric</td>
</tr>
<tr>
<td>Building Functions</td>
<td></td>
<td>F.BF.3</td>
<td>Identify the effect on the graph of replacing ( f(x) ) by ( f(x) + k ), ( k f(x) ), ( f(kx) ), and ( f(x + k) ) for specific values of ( k ) (both positive and negative); find the value of ( k ) given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.</td>
<td>Under review</td>
<td>Under Consideration</td>
<td>Exponential and Power Graphs Functions Parabolas</td>
</tr>
<tr>
<td>Building Functions</td>
<td></td>
<td>F.BF.4.a</td>
<td>Find inverse functions. Solve an equation of the form ( f(x) = c ) for a simple function ( f ) that has an inverse and write an expression for the inverse. For example, ( f(x) = 2^x ) or ( f(x) = (x + 1)/(x - 1) ) for ( x \neq 1 ).</td>
<td>Functions</td>
<td>Inverse Functions</td>
<td>Functions</td>
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## CCSS Algebra I

### Domain | Cluster | Standard | Description | Topic | Activities | eBooks
--- | --- | --- | --- | --- | --- | ---
**Conceptual Category: Functions**

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<tr>
<th>Domain, Quadratic, and Exponential Models</th>
<th>Construct and compare linear, quadratic, and exponential models and solve problems.</th>
<th>F.LE.1.a</th>
<th>Distinguish between situations that can be modeled with linear functions and with exponential functions. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.</th>
<th>Under review</th>
<th>Under Consideration</th>
<th>Sequences &amp; Series: Arithmetic Sequences &amp; Series: Geometric</th>
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<tbody>
<tr>
<td>Linear, Quadratic, and Exponential Models</td>
<td>Construct and compare linear, quadratic, and exponential models and solve problems.</td>
<td>F.LE.1.b</td>
<td>Distinguish between situations that can be modeled with linear functions and with exponential functions. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.</td>
<td>Functions</td>
<td>What Type of Function?</td>
<td>Straight Lines, Sequences &amp; Series: Arithmetic</td>
</tr>
<tr>
<td>Linear, Quadratic, and Exponential Models</td>
<td>Construct and compare linear, quadratic, and exponential models and solve problems.</td>
<td>F.LE.1.c</td>
<td>Distinguish between situations that can be modeled with linear functions and with exponential functions. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.</td>
<td>Functions</td>
<td>What Type of Function?</td>
<td>Depreciation, Interest, Sequences &amp; Series: Geometric</td>
</tr>
<tr>
<td>Linear, Quadratic, and Exponential Models</td>
<td>Construct and compare linear, quadratic, and exponential models and solve problems.</td>
<td>F.LE.2</td>
<td>Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).</td>
<td>Functions</td>
<td>Find the Function Rule</td>
<td>Sequences &amp; Series: Arithmetic</td>
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<tr>
<td>Linear Expressions and Equations</td>
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<td>Linear Expressions and Equations</td>
<td>Equations to Solve Problems, Writing Equations, Word Problems, Equation from Two Points, Equation of a Line 1, Modeling Linear Relationships</td>
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<tr>
<td>Arithmetic and Geometric Sequences</td>
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<td>Arithmetic and Geometric Sequences</td>
<td>Terms: Geometric Progressions 2, Depreciation, Interest, Sequences &amp; Series: Geometric</td>
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<tr>
<td>Conceptual Category: Functions</td>
<td>Linear, Quadratic, and Exponential Models</td>
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<td>Construct and compare linear, quadratic, and exponential models and solve problems.</td>
<td>F.LE.3</td>
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<tr>
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<td>Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.</td>
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<td>Under Consideration</td>
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<td>Interpret expressions for functions in terms of the situation they model.</td>
<td>F.LE.5</td>
<td>Interpret the parameters in a linear or exponential function in terms of a context.</td>
<td>Linear Expressions and Equations</td>
<td>Gradients for Real</td>
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<td>Conceptual Category: Statistics and Probability</td>
<td>Interpreting Categorical and Quantitative Data</td>
<td>S.ID.1</td>
<td>Represent data with plots on the real number line (dot plots, histograms, and box plots).</td>
<td>Descriptive Statistics</td>
<td>Dot Plots</td>
<td>Data Interpreting Data</td>
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<td>Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.</td>
<td>Descriptive Statistics</td>
<td>Histograms</td>
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<td>Skewness of Data</td>
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<td>Interpreting Categorical and Quantitative Data</td>
<td>Summarize, represent, and interpret data on a single count or measurement variable.</td>
<td>S.ID.3</td>
<td>Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).</td>
<td>Descriptive Statistics</td>
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<tr>
<td>Interpreting Categorical and Quantitative Data</td>
<td>Summarize, represent, and interpret data on a single count or measurement variable.</td>
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<td>Summarize, represent, and interpret data on two categorical and</td>
<td>S.ID.5</td>
<td>Summarize categorical data for two categories in two-way frequency tables.</td>
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<td>and Quantitative Data</td>
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<td>Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.</td>
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<tr>
<td>Interpreting Categorical</td>
<td>Summarize, represent, and interpret data on two categorical and</td>
<td>S.ID.6.a</td>
<td>Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.</td>
<td>Under review</td>
<td>Under Consideration</td>
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<tr>
<td>and Quantitative Data</td>
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<tr>
<td>Interpreting Categorical</td>
<td>Summarize, represent, and interpret data on two categorical and</td>
<td>S.ID.6.b</td>
<td>Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. Informally assess the fit of a function by plotting and analyzing residuals.</td>
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<td>Interpreting Categorical</td>
<td>Summarize, represent, and interpret data on two categorical and</td>
<td>S.ID.6.c</td>
<td>Fit a linear function for a scatter plot that suggests a linear association.</td>
<td>Descriptive Statistics</td>
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<td>Interpret linear models.</td>
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<td>Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.</td>
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<td>Interpreting Categorical</td>
<td>Interpret linear models.</td>
<td>S.ID.8</td>
<td>Compute (using technology) and interpret the correlation coefficient of a linear fit.</td>
<td>Descriptive Statistics</td>
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<td>Interpreting Categorical</td>
<td>Interpret linear models.</td>
<td>S.ID.9</td>
<td>Distinguish between correlation and causation</td>
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<td>Congruence</td>
<td>Experiment with transformations in the plane.</td>
<td>G.CO.1</td>
<td>Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.</td>
<td>Line and Angle Basics</td>
<td>What Line Am I? Classifying Angles Labelling Angles Angles in a Revolution</td>
<td>Under review</td>
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<td>Congruence</td>
<td>Experiment with transformations in the plane.</td>
<td>G.CO.2</td>
<td>Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).</td>
<td>Rigid Transformations</td>
<td>Transformations Transformations: Coordinate Plane Rotations: Coordinate Plane</td>
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<tr>
<td>Congruence</td>
<td>Experiment with transformations in the plane.</td>
<td>G.CO.3</td>
<td>Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.</td>
<td>Rigid Transformations</td>
<td>Symmetry or Not 1 Symmetry or Not? Rotational Symmetry</td>
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<td>Congruence</td>
<td>Experiment with transformations in the plane.</td>
<td>G.CO.4</td>
<td>Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.</td>
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<td>Congruence</td>
<td>Experiment with transformations in the plane.</td>
<td>G.CO.5</td>
<td>Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.</td>
<td></td>
<td>Under Consideration</td>
<td>Under review</td>
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# CCSS Geometry

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<tr>
<td>Congruence</td>
<td>Understand congruence in terms of rigid motions.</td>
<td>G.CO.6</td>
<td>Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.</td>
<td>Rigid Transformations</td>
<td>Congruent Figures (Grid)</td>
<td>Under review</td>
</tr>
<tr>
<td>Congruence</td>
<td>Understand congruence in terms of rigid motions.</td>
<td>G.CO.7</td>
<td>Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.</td>
<td>Rigid Transformations</td>
<td>Congruent Figures (Dots)</td>
<td>Similarity and Congruence</td>
</tr>
<tr>
<td>Congruence</td>
<td>Understand congruence in terms of rigid motions.</td>
<td>G.CO.8</td>
<td>Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.</td>
<td>Under review</td>
<td>Under Consideration</td>
<td>Similarity and Congruence</td>
</tr>
<tr>
<td>Congruence</td>
<td>Prove Geometric Theorems.</td>
<td>G.CO.9</td>
<td>Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment’s endpoints.</td>
<td>Geometric Theorems</td>
<td>Parallel Lines Angles and Parallel Lines</td>
<td>Under review</td>
</tr>
<tr>
<td>Congruence</td>
<td>Prove Geometric Theorems.</td>
<td>G.CO.10</td>
<td>Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.</td>
<td>Geometric Theorems</td>
<td>Angle Measures in a Triangle Plane Figure Theorems Ratio of Intercepts</td>
<td>Polygons and Angles</td>
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## CCSS Geometry

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<tr>
<td>Congruence</td>
<td>Prove geometric theorems.</td>
<td>G.CO.11</td>
<td>Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.</td>
<td>Geometric Theorems</td>
<td>Plane Figure Theorems</td>
<td>Under review</td>
</tr>
<tr>
<td>Congruence</td>
<td>Make geometric constructions.</td>
<td>G.CO.12</td>
<td>Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.</td>
<td>Under review</td>
<td>Under Review</td>
<td>Constructions</td>
</tr>
<tr>
<td>Congruence</td>
<td>Make geometric constructions.</td>
<td>G.CO.13</td>
<td>Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.</td>
<td>Under review</td>
<td>Under Review</td>
<td>Constructions</td>
</tr>
<tr>
<td>Similarity, Right Triangles, and Trigonometry</td>
<td>Understand similarity in terms of similarity transformations.</td>
<td>G.SRT.1.a</td>
<td>Verify experimentally the properties of dilations given by a center and a scale factor: A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged.</td>
<td>Under review</td>
<td>Under Review</td>
<td>Under Review</td>
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<tr>
<td>Similarity, Right Triangles, and Trigonometry</td>
<td>Understand similarity in terms of similarity transformations.</td>
<td>G.SRT.1.b</td>
<td>Verify experimentally the properties of dilations given by a center and a scale factor: The dilation of a line segment is longer or shorter in the ratio given by the scale factor.</td>
<td>Similarity</td>
<td>Scale Measurement Scale Factor</td>
<td>Under review</td>
</tr>
<tr>
<td>Similarity, Right Triangles, and Trigonometry</td>
<td>Understand similarity in terms of similarity transformations.</td>
<td>G.SRT.2</td>
<td>Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.</td>
<td>Similarity</td>
<td>Similar Figures Similar Figures 1</td>
<td>Similarity and Congruence</td>
</tr>
<tr>
<td>Similarity, Right Triangles, and Trigonometry</td>
<td>Understand similarity in terms of similarity transformations.</td>
<td>G.SRT.3</td>
<td>Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.</td>
<td>Similarity</td>
<td>Similarity Proofs</td>
<td>Similarity and Congruence</td>
</tr>
<tr>
<td>Similarity, Right Triangles, and Trigonometry</td>
<td>Prove theorems involving similarity.</td>
<td>G.SRT.4</td>
<td>Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.</td>
<td>Geometric Theorems</td>
<td>Ratio of Intercepts</td>
<td>Under review</td>
</tr>
<tr>
<td>Similarity, Right Triangles, and Trigonometry</td>
<td>Prove theorems involving similarity.</td>
<td>G.SRT.5</td>
<td>Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.</td>
<td>Congruence</td>
<td>Congruent Figures: Find Values</td>
<td>Similarity and Congruence</td>
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<td>Similarity</td>
<td>Using Similar Triangles Using Similar Triangles 1</td>
<td>Similarity and Congruence</td>
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<tr>
<td>Similarity, Right Triangles, and Trigonometry</td>
<td>Define trigonometric ratios and solve problems involving right triangles.</td>
<td>G.SRT.6</td>
<td>Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.</td>
<td>Trigonometry</td>
<td>Exact Trigonometric Ratios Sin A Cos A Tan A</td>
<td>Trigonometry</td>
</tr>
<tr>
<td>Similarity, Right Triangles, and Trigonometry</td>
<td>Define trigonometric ratios and solve problems involving right triangles.</td>
<td>G.SRT.7</td>
<td>Explain and use the relationship between the sine and cosine of complementary angles.</td>
<td>Under review</td>
<td>Under Consideration</td>
<td>Trigonometric Relationships</td>
</tr>
<tr>
<td>Similarity, Right Triangles, and Trigonometry</td>
<td>Define trigonometric ratios and solve problems involving right triangles.</td>
<td>G.SRT.8</td>
<td>Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.</td>
<td>Trigonometry</td>
<td>Pythagorean Theorem Find Unknown Sides Find Unknown Angles Elevation and Depression Trigonometry Problems 2</td>
<td>Pythagorean Theorem Trigonometry</td>
</tr>
<tr>
<td>Similarity, Right Triangles, and Trigonometry</td>
<td>Apply trigonometry to general triangles.</td>
<td>G.SRT.9</td>
<td>Derive the formula $A = \frac{1}{2}ab \sin(C)$ for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side.</td>
<td>Trigonometry</td>
<td>Area Rule 1 Area Rule 2 Area Problems</td>
<td>Non Right Angled Triangles</td>
</tr>
<tr>
<td>Similarity, Right Triangles, and Trigonometry</td>
<td>Apply trigonometry to general triangles.</td>
<td>G.SRT.10</td>
<td>Prove the Laws of Sines and Cosines and use them to solve problems.</td>
<td>Trigonometry</td>
<td>Sine Rule 1 Cosine Rule 1 Cosine Rule 2</td>
<td>Non Right Angled Triangles</td>
</tr>
<tr>
<td>Similarity, Right Triangles, and Trigonometry</td>
<td>Apply trigonometry to general triangles.</td>
<td>G.SRT.11</td>
<td>Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).</td>
<td>Trigonometry</td>
<td>Sine Rule 1 Cosine Rule 1 Cosine Rule 2</td>
<td>Non Right Angled Triangles</td>
</tr>
<tr>
<td>Circles</td>
<td>Understand and apply theorems about circles.</td>
<td>G.C.1</td>
<td>Prove that all circles are similar.</td>
<td>Under review</td>
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<tr>
<td>Circles</td>
<td>Understand and apply theorems about circles.</td>
<td>G.C.2</td>
<td>Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.</td>
<td>Circles</td>
<td>Circle Terms Circle Theorem Tangents and Secants</td>
<td>Tangents and Secants Chords and Angles</td>
</tr>
<tr>
<td>Circles</td>
<td>Understand and apply theorems about circles.</td>
<td>G.C.3</td>
<td>Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.</td>
<td>Under review</td>
<td>Under Consideration Under review Under review Under review</td>
<td></td>
</tr>
<tr>
<td>Circles</td>
<td>Understand and apply theorems about circles.</td>
<td>G.C.4</td>
<td>Construct a tangent line from a point outside a given circle to the circle.</td>
<td>Circles</td>
<td>Intersection: Line &amp; Circle</td>
<td>Constructions</td>
</tr>
<tr>
<td>Circles</td>
<td></td>
<td>G.C.5</td>
<td>Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.</td>
<td>Circles</td>
<td>Converting Radians and Degrees Perimeter and Circles Arc Length Length of an Arc Area of a Sector (degrees and radians)</td>
<td>Perimeter and Area</td>
</tr>
<tr>
<td>Expressing Geometric Properties with Equations</td>
<td>Translate between the geometric description and the equation for a conic section.</td>
<td>G.GPE.1</td>
<td>Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.</td>
<td>Circles</td>
<td>Centre and Radius 1 Centre and Radius 2 Graphing Circles</td>
<td>Circle Graphs</td>
</tr>
<tr>
<td>Expressing Geometric Properties with Equations</td>
<td>Translate between the geometric description and the equation for a conic section.</td>
<td>G.GPE.2</td>
<td>Derive the equation of a parabola given a focus and directrix.</td>
<td>Equations of Parabolas</td>
<td>Vertex of a Parabola Graphing Parabolas Focus and Directrix 1 Focus and Directrix 2 Focus and Directrix 3 Focus and Directrix 4</td>
<td>Under review</td>
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<tr>
<td>Expressing Geometric Properties with Equations</td>
<td>Use coordinates to prove simple geometric theorems algebraically.</td>
<td>G.GPE.4</td>
<td>Use coordinates to prove simple geometric theorems algebraically. For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point $(1, \sqrt{3})$ lies on the circle centered at the origin and containing the point $(0, 2)$.</td>
<td>Connecting Geometry and Algebra</td>
<td>Coordinate Methods in Geometry Perpendicular Distance 1 Perpendicular Distance 2</td>
<td>Coordinate Geometry Circle Graphs</td>
</tr>
<tr>
<td>Expressing Geometric Properties with Equations</td>
<td>Use coordinates to prove simple geometric theorems algebraically.</td>
<td>G.GPE.5</td>
<td>Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).</td>
<td>Connecting Geometry and Algebra</td>
<td>Are they Parallel? Are they Perpendicular? Equation of a Line 3 Equation from Point and Gradient</td>
<td>Linear Relationships Straight Lines</td>
</tr>
<tr>
<td>Expressing Geometric Properties with Equations</td>
<td>Use coordinates to prove simple geometric theorems algebraically.</td>
<td>G.GPE.6</td>
<td>Find the point on a directed line segment between two given points that partitions the segment in a given ratio.</td>
<td>Connecting Geometry and Algebra</td>
<td>Midpoint by Formula</td>
<td>Coordinate Geometry</td>
</tr>
<tr>
<td>Expressing Geometric Properties with Equations</td>
<td>Use coordinates to prove simple geometric theorems algebraically.</td>
<td>G.GPE.7</td>
<td>Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.</td>
<td>Connecting Geometry and Algebra</td>
<td>Distance Between Two Points</td>
<td>Coordinate Geometry</td>
</tr>
<tr>
<td>Geometric Measurement and Dimension</td>
<td>Explain volume formulas and use them to solve problems.</td>
<td>G.GMD.1</td>
<td>Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri’s principle, and informal limit arguments.</td>
<td>Under review</td>
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<tr>
<td>Geometric Measurement and Dimension</td>
<td>Explain volume formulas and use them to solve problems.</td>
<td>G.GMD.3</td>
<td>Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.</td>
<td>Three-Dimensional Figures</td>
<td>Measuring Solids</td>
<td></td>
</tr>
<tr>
<td>Geometric Measurement and Dimension</td>
<td>Visualize relationships between two-dimensional and three-dimensional objects.</td>
<td>G.GMD.4</td>
<td>Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.</td>
<td>Three-Dimensional Figures</td>
<td></td>
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</tr>
<tr>
<td>Modeling with Geometry</td>
<td>Apply geometric concepts in modeling situations.</td>
<td>G.MG.1</td>
<td>Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).</td>
<td>Three-Dimensional Figures</td>
<td>Right and Oblique Objects Match the Solid 2</td>
<td>Measuring Solids</td>
</tr>
<tr>
<td>Modeling with Geometry</td>
<td>Apply geometric concepts in modeling situations.</td>
<td>G.MG.2</td>
<td>Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).</td>
<td>Under review</td>
<td>Under Consideration</td>
<td>Under review</td>
</tr>
<tr>
<td>Modeling with Geometry</td>
<td>Apply geometric concepts in modeling situations.</td>
<td>G.MG.3</td>
<td>Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).</td>
<td>Trigonometry Problems 2</td>
<td></td>
<td>Under review</td>
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<tr>
<td>Conditional Probability and the Rules of Probability</td>
<td>Understand independence and conditional probability and use them to interpret data.</td>
<td>S.CP1</td>
<td>Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events (&quot;or,&quot; &quot;and,&quot; &quot;not&quot;).</td>
<td>Probability</td>
<td>Complementary Events Venn Diagrams Probability - 'And' and 'Or'</td>
<td>Probability</td>
</tr>
<tr>
<td>Conditional Probability and the Rules of Probability</td>
<td>Understand independence and conditional probability and use them to interpret data.</td>
<td>S.CP2</td>
<td>Understand that two events (A) and (B) are independent if the probability of (A) and (B) occurring together is the product of their probabilities, and use this characterization to determine if they are independent.</td>
<td>Under review</td>
<td>Under Consideration</td>
<td>Probability</td>
</tr>
<tr>
<td>Conditional Probability and the Rules of Probability</td>
<td>Understand independence and conditional probability and use them to interpret data.</td>
<td>S.CP3</td>
<td>Understand the conditional probability of (A) given (B) as (P(A \mid B) = \frac{P(A \text{ and } B)}{P(B)}), and interpret independence of (A) and (B) as saying that the conditional probability of (A) given (B) is the same as the probability of (A), and the conditional probability of (B) given (A) is the same as the probability of (B).</td>
<td>Under review</td>
<td>Under Consideration</td>
<td>Under review</td>
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<tr>
<td>Conditional Probability and the Rules of Probability</td>
<td>Understand independence and conditional probability and use them to interpret data.</td>
<td>S.CP4</td>
<td>Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. For example, collect data from a random sample of students in your school on their favorite subject among math, science, and English. Estimate the probability that a randomly selected student from your school will favor science given that the student is in tenth grade. Do the same for other subjects and compare the results.</td>
<td>Probability</td>
<td>Two-way Table Probability Tables</td>
<td>Probability</td>
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### CCSS Standards

**Alignment with Mathletics**

**Conceptual Category: Statistics and Probability**

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<td>Conditional Probability and the Rules of Probability</td>
<td>Understand independence and conditional probability and use them to interpret data.</td>
<td>S.CP.5</td>
<td>Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. For example, compare the chance of having lung cancer if you are a smoker with the chance of being a smoker if you have lung cancer.</td>
<td>Under review</td>
<td>Under Consideration</td>
<td>Under review</td>
</tr>
<tr>
<td>Conditional Probability and the Rules of Probability</td>
<td>Use the rules of probability to compute probabilities of compound events in a uniform probability model.</td>
<td>S.CP.6</td>
<td>Find the conditional probability of $A$ given $B$ as the fraction of $B$'s outcomes that also belong to $A$, and interpret the answer in terms of the model.</td>
<td>Under review</td>
<td>Under Consideration</td>
<td>Under review</td>
</tr>
<tr>
<td>Conditional Probability and the Rules of Probability</td>
<td>Use the rules of probability to compute probabilities of compound events in a uniform probability model.</td>
<td>S.CP.7</td>
<td>Apply the Addition Rule, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$, and interpret the answer in terms of the model.</td>
<td>Probability</td>
<td>Find the Probability</td>
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<tr>
<td>Conditional Probability and the Rules of Probability</td>
<td>Use the rules of probability to compute probabilities of compound events in a uniform probability model.</td>
<td>S.CP.8</td>
<td>Apply the general Multiplication Rule in a uniform probability model, $P(A \text{ and } B) = P(A) \cdot P(B</td>
<td>A) = P(B) \cdot P(A</td>
<td>B)$, and interpret the answer in terms of the model.</td>
<td>Probability</td>
</tr>
<tr>
<td>Conditional Probability and the Rules of Probability</td>
<td>Use the rules of probability to compute probabilities of compound events in a uniform probability model.</td>
<td>S.CP.9</td>
<td>Use permutations and combinations to compute probabilities of compound events and solve problems.</td>
<td>Probability</td>
<td>Counting Techniques 1 Counting Techniques 2 Tree Diagrams</td>
<td>Under review</td>
</tr>
<tr>
<td>Using Probability to Make Decisions</td>
<td>Use probability to evaluate outcomes of decisions.</td>
<td>S.MD.6</td>
<td>Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator).</td>
<td>Probability</td>
<td>Fair Games</td>
<td>Under review</td>
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</table>
## Conceptual Category: Statistics and Probability

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<tbody>
<tr>
<td>Using Probability to Make Decisions</td>
<td>Use probability to evaluate outcomes of decisions.</td>
<td>S.MD.7</td>
<td>Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).</td>
<td>Under review</td>
<td>Under Consideration</td>
<td>Under review</td>
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<tr>
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</tr>
<tr>
<td>The Complex Number System</td>
<td>Perform arithmetic operations with complex numbers.</td>
<td>N.CN.1</td>
<td>Know there is a complex number ( i ) such that ( i^2 = -1 ), and every complex number has the form ( a + bi ) with ( a ) and ( b ) real.</td>
<td>Complex Numbers</td>
<td>Introduction to Complex Numbers</td>
<td>Under review</td>
</tr>
<tr>
<td>The Complex Number System</td>
<td>Perform arithmetic operations with complex numbers.</td>
<td>N.CN.2</td>
<td>Use the relation ( i^2 = -1 ) and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.</td>
<td>Complex Numbers</td>
<td>Powers of ( i )</td>
<td>Under review</td>
</tr>
<tr>
<td>The Complex Number System</td>
<td>Use complex numbers in polynomial identities and equations.</td>
<td>N.CN.7</td>
<td>Solve quadratic equations with real coefficients that have complex solutions.</td>
<td>Under review</td>
<td>Under Consideration</td>
<td>Under review</td>
</tr>
<tr>
<td>The Complex Number System</td>
<td>Use complex numbers in polynomial identities and equations.</td>
<td>N.CN.8</td>
<td>Extend polynomial identities to the complex numbers. For example, rewrite ( x^2 + 4 ) as ( (x + 2i)(x - 2i) ).</td>
<td>Under review</td>
<td>Under Consideration</td>
<td>Under review</td>
</tr>
<tr>
<td>The Complex Number System</td>
<td>Use complex numbers in polynomial identities and equations.</td>
<td>N.CN.9</td>
<td>Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials.</td>
<td>Under review</td>
<td>Under Consideration</td>
<td>Under review</td>
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<tr>
<td>Conceptual Category: Algebra</td>
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<tr>
<td>Seeing Structure in</td>
<td>Interpret the structure of expressions.</td>
<td>A.SSE.1.a</td>
<td>Interpret expressions that represent a quantity in terms of its context. Interpret parts of an expression, such as terms, factors, and coefficients.</td>
<td>Modeling with Functions</td>
<td>Gradients for Real</td>
<td>Sketching Polynomials</td>
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<td>Expressions</td>
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<td>Exponential Growth and Decay</td>
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<tr>
<td>Seeing Structure in</td>
<td>Interpret the structure of expressions.</td>
<td>A.SSE.1.b</td>
<td>Interpret expressions that represent a quantity in terms of its context. Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret ( P(1 + r)^n ) as the product of ( P ) and a factor not depending on ( P ).</td>
<td>Solving Higher Order</td>
<td>Factoring Expressions</td>
<td>Geometric Series in Finance</td>
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<td>Expressions</td>
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<td>Equations</td>
<td>Equations Reducible to</td>
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<td>Quadratics</td>
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<tr>
<td>Conceptual Category: Algebra</td>
<td>Seeing Structure in Expressions</td>
<td>A.SSE.2</td>
<td>Use the structure of an expression to identify ways to rewrite it. For example, see $x^n - y^n$ as $(x^n - y^n)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.</td>
<td>Solving Higher Order Equations</td>
<td>Equations Reducible to Quadratics</td>
<td>Factorizing</td>
</tr>
<tr>
<td></td>
<td>Seeing Structure in Expressions</td>
<td>A.SSE.4</td>
<td>Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. For example, calculate mortgage payments.</td>
<td>Sequences and Series</td>
<td>Limiting Sum Terms: Geometric Progressions 1</td>
<td>Sequences &amp; Series: Geometric Geometric Progressions and Loan Repayments Geometric Series in Finance</td>
</tr>
<tr>
<td></td>
<td>Arithmetic with Polynomials and Rational Expressions</td>
<td>A.APR.1</td>
<td>Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.</td>
<td>Polynomial Arithmetic</td>
<td>Like Terms: Add, Subtract Algebraic Multiplication Multiplication with Exponents Dividing Expressions Algebraic Fractions 1 Indirect Variation Special Binomial Products Expanding Brackets Expand then Simplify Expanding Binomial Products</td>
<td>Polynomials Equations Expanding and Factorizing Simplifying Algebra Binomials and Pascal’s Triangle</td>
</tr>
<tr>
<td></td>
<td>Arithmetic with Polynomials and Rational Expressions</td>
<td>A.APR.2</td>
<td>Know and apply the Remainder Theorem: For a polynomial $p(x)$ and a number $a$, the remainder on division by $x - a$ is $p(a)$, so $p(a) = 0$ if and only if $(x - a)$ is a factor of $p(x)$.</td>
<td>Solving Higher Order Equations</td>
<td>Polynomial Factor Theorem</td>
<td>Polynomials</td>
</tr>
<tr>
<td></td>
<td>Arithmetic with Polynomials and Rational Expressions</td>
<td>A.APR.3</td>
<td>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.</td>
<td>Solving Higher Order Equations</td>
<td>Factoring Expressions Equations Reducible to Quadratics Polynomial Factor Theorem Graphing Cubics</td>
<td>Factorizing Polynomials Sketching Polynomials</td>
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<tbody>
<tr>
<td>Arithmetic with Polynomials and Rational Expressions</td>
<td>Use polynomial identities to solve problems.</td>
<td>A.APR.4</td>
<td>Prove polynomial identities and use them to describe numerical relationships. For example, the polynomial identity ((x^2 + y^2)^2 = (x^2 - y^2)^2 + (2xy)^2) can be used to generate Pythagorean triples.</td>
<td>Solving Higher Order Equations</td>
<td></td>
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</tr>
<tr>
<td>Arithmetic with Polynomials and Rational Expressions</td>
<td>Use polynomial identities to solve problems.</td>
<td>A.APR.5</td>
<td>Know and apply the Binomial Theorem for the expansion of ((x + y)^n) in powers of (x) and (y) for a positive integer (n), where (x) and (y) are any numbers, with coefficients determined for example by Pascal’s Triangle.</td>
<td>Under review</td>
<td>Under Review</td>
<td></td>
</tr>
<tr>
<td>Arithmetic with Polynomials and Rational Expressions</td>
<td>Rewrite rational expressions.</td>
<td>A.APR.6</td>
<td>Rewrite simple rational expressions in different forms; write (a(x)/b(x)) in the form (q(x) + r(x)/b(x)), where (a(x), b(x), q(x)), and (r(x)) are polynomials with the degree of (r(x)) less than the degree of (b(x)), using inspection, long division, or, for the more complicated examples, a computer algebra system.</td>
<td>Polynomial Arithmetic</td>
<td>Polynomials</td>
<td></td>
</tr>
<tr>
<td>Arithmetic with Polynomials and Rational Expressions</td>
<td>Rewrite rational expressions.</td>
<td>A.APR.7</td>
<td>Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.</td>
<td>Rational Equations</td>
<td>Factorizing</td>
<td></td>
</tr>
<tr>
<td>Creating Equations</td>
<td>Create equations that describe numbers or relationships.</td>
<td>A.CED.1</td>
<td>Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.</td>
<td>Modeling with Functions</td>
<td>Under review</td>
<td></td>
</tr>
<tr>
<td>Creating Equations</td>
<td>Create equations that describe numbers or relationships.</td>
<td>A.CED.2</td>
<td>Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</td>
<td>Modeling with Functions</td>
<td>Under review</td>
<td></td>
</tr>
<tr>
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</tr>
<tr>
<td>Conceptual Category: Algebra</td>
<td>Creating Equations</td>
<td>A.CED.3</td>
<td>Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.</td>
<td>Under review</td>
<td>Under</td>
<td>Consideration</td>
</tr>
<tr>
<td></td>
<td>Creating Equations</td>
<td>A.CED.4</td>
<td>Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm’s law $V = IR$ to highlight resistance $R$.</td>
<td>Inverse Functions</td>
<td>Inverse Functions</td>
<td>Under review</td>
</tr>
<tr>
<td></td>
<td>Reasoning with Equations and Inequalities</td>
<td>A.REI.2</td>
<td>Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.</td>
<td>Radical Equations</td>
<td>Radical Equations</td>
<td>Under review</td>
</tr>
<tr>
<td></td>
<td>Reasoning with Equations and Inequalities</td>
<td>A.REI.11</td>
<td>Explain why the $x$-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.</td>
<td>Solving Higher Order Equations</td>
<td>Solving Systems by Graphing</td>
<td>Under review</td>
</tr>
<tr>
<td></td>
<td>Reasoning with Equations and Inequalities</td>
<td>A.REI.11</td>
<td></td>
<td>Rational Equations</td>
<td>Graphing Hyperbolas</td>
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<tbody>
<tr>
<td>Interpreting</td>
<td>Functions</td>
<td>F.IF.4</td>
<td>For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.</td>
<td>Modeling with Functions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interpreting</td>
<td>Functions</td>
<td>F.IF.5</td>
<td>Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function ( h(n) ) gives the number of person-hours it takes to assemble ( n ) engines in a factory, then the positive integers would be an appropriate domain for the function.</td>
<td>Modeling with Functions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interpreting</td>
<td>Functions</td>
<td>F.IF.6</td>
<td>Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.</td>
<td>Under review</td>
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</tr>
<tr>
<td>Interpreting</td>
<td>Functions</td>
<td>F.IF.7.b</td>
<td>Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.</td>
<td>Inverse Functions</td>
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**Conceptual Category: Functions**

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<td>Interpreting Functions</td>
<td>Analyze functions using different representations.</td>
<td>F.IF.7.c</td>
<td>Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.</td>
<td>Solving Higher Order Equations</td>
<td>Graphing Cubics</td>
<td>Exponential and Power Graphs Sketching Polynomials</td>
</tr>
<tr>
<td>Interpreting Functions</td>
<td>Analyze functions using different representations.</td>
<td>F.IF.7.e</td>
<td>Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.</td>
<td>Trigonometric Functions</td>
<td>Sine and Cosine Curves Trig Graphs in Radians Graph Inverse Trig Functions</td>
<td>Trigonometric Relationships</td>
</tr>
<tr>
<td>Interpreting Functions</td>
<td>Analyze functions using different representations.</td>
<td>F.IF.8.a</td>
<td>Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.</td>
<td>Polynomial Arithmetic</td>
<td>Polynomial Long Division Simplifying Binomial Expressions</td>
<td>Factorizing Polynomials Sketching Polynomials</td>
</tr>
<tr>
<td>Interpreting Functions</td>
<td>Analyze functions using different representations.</td>
<td>F.IF.9</td>
<td>Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.</td>
<td>Under review</td>
<td>Under Consideration</td>
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</tr>
<tr>
<td>Building Functions</td>
<td>Build a function that models a relationship between two quantities.</td>
<td>F.BF.1.a</td>
<td>Write a function that describes a relationship between two quantities. Determine an explicit expression, a recursive process, or steps for calculation from a context.</td>
<td>Modeling with Functions</td>
<td>Gradients for Real Write an Equation: Word Problems</td>
<td>Under review</td>
</tr>
<tr>
<td>Building Functions</td>
<td>Build a function that models a relationship between two quantities.</td>
<td>F.BF.1.b</td>
<td>Write a function that describes a relationship between two quantities. Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.</td>
<td>Under review</td>
<td>Under Consideration</td>
<td>Under review</td>
</tr>
<tr>
<td>Building Functions</td>
<td>Build new functions from existing functions.</td>
<td>F.BF.3</td>
<td>Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.</td>
<td>Modeling with Functions</td>
<td>Odd and Even Functions</td>
<td>Exponential and Power Graphs Functions Sketching Polynomials</td>
</tr>
<tr>
<td>Building Functions</td>
<td>Build new functions from existing functions.</td>
<td>F.BF.4.a</td>
<td>Find inverse functions. Solve an equation of the form f(x) = c for a simple function f that has an inverse and write an expression for the inverse. For example, f(x) = 2x^3 or f(x) = (x + 1)/(x - 1) for x ≠ 1.</td>
<td>Inverse Functions</td>
<td>Inverse Functions</td>
<td>Under review</td>
</tr>
<tr>
<td>Linear, Quadratic, and Exponential Models</td>
<td>Construct and compare linear, quadratic, and exponential models and solve problems.</td>
<td>F.LE.4</td>
<td>For exponential models, express as a logarithm the solution to ab^ct = d where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology.</td>
<td>Exponents and Logarithms</td>
<td>Log Laws Equations with Logs Log Base ‘e’</td>
<td>Logarithms</td>
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<tr>
<td>Trigonometric Functions</td>
<td>Extend the domain of trigonometric functions using the unit circle.</td>
<td>F.TF.1</td>
<td>Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.</td>
<td>Trigonometric Functions</td>
<td></td>
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<td>Under review</td>
</tr>
<tr>
<td>Trigonometric Functions</td>
<td>Extend the domain of trigonometric functions using the unit circle.</td>
<td>F.TF.2</td>
<td>Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.</td>
<td>Trigonometric Functions</td>
<td></td>
<td></td>
<td>Trigonometric Relationships</td>
</tr>
<tr>
<td>Trigonometric Functions</td>
<td>Model periodic phenomena with trigonometric functions.</td>
<td>F.TF.5</td>
<td>Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.</td>
<td>Trigonometric Functions</td>
<td></td>
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<td>Under review</td>
</tr>
<tr>
<td>Trigonometric Functions</td>
<td>Prove and apply trigonometric identities.</td>
<td>F.FT.8</td>
<td>Prove the Pythagorean identity (\sin^2(\theta) + \cos^2(\theta) = 1) and use it to find (\sin(\theta), \cos(\theta),) or (\tan(\theta)) given (\sin(\theta), \cos(\theta),) or (\tan(\theta)) and the quadrant of the angle.</td>
<td>Trigonometric Functions</td>
<td></td>
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<td>Under review</td>
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#### Conceptual Category: Statistics and Probability

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<tbody>
<tr>
<td>Interpreting Categorical and Quantitative Data</td>
<td>Summarize, represent, and interpret data on a single count or measurement variable.</td>
<td>S.ID.4</td>
<td>Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.</td>
<td>Collecting and Analyzing Data</td>
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</tr>
<tr>
<td>Making Inferences and Justifying Conclusions</td>
<td>Understand and evaluate random processes underlying statistical experiments.</td>
<td>S.IC.1</td>
<td>Understand statistics as a process for making inferences about population parameters based on a random sample from that population.</td>
<td>Collecting and Analyzing Data</td>
<td>Capture Recapture Technique Probability Tables Two-way Table Probability</td>
<td>Under review</td>
</tr>
<tr>
<td>Making Inferences and Justifying Conclusions</td>
<td>Understand and evaluate random processes underlying statistical experiments.</td>
<td>S.IC.2</td>
<td>Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation. For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model?</td>
<td></td>
<td>Under review Under Consideration</td>
<td>Under review</td>
</tr>
<tr>
<td>Making Inferences and Justifying Conclusions</td>
<td>Make inferences and justify conclusions from sample surveys, experiments, and observational studies.</td>
<td>S.IC.3</td>
<td>Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.</td>
<td></td>
<td>Under review Under Consideration</td>
<td>Under review</td>
</tr>
<tr>
<td>Making Inferences and Justifying Conclusions</td>
<td>Make inferences and justify conclusions from sample surveys, experiments, and observational studies.</td>
<td>S.IC.4</td>
<td>Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.</td>
<td></td>
<td>Under review Under Consideration</td>
<td>Under review</td>
</tr>
<tr>
<td>Making Inferences and Justifying Conclusions</td>
<td>Make inferences and justify conclusions from sample surveys, experiments, and observational studies.</td>
<td>S.IC.5</td>
<td>Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.</td>
<td></td>
<td>Under review Under Consideration</td>
<td>Under review</td>
</tr>
<tr>
<td>Making Inferences and Justifying Conclusions</td>
<td>Make inferences and justify conclusions from sample surveys, experiments, and observational studies.</td>
<td>S.IC.6</td>
<td>Evaluate reports based on data.</td>
<td></td>
<td>Under review Under Consideration</td>
<td>Under review</td>
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</table>
### Conceptual Category: Statistics and Probability

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<th>Activities</th>
<th>eBooks</th>
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</thead>
<tbody>
<tr>
<td>Using Probability</td>
<td>Use probability to evaluate outcomes of decisions.</td>
<td>S.MD.6</td>
<td>Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator).</td>
<td>Collecting and Analyzing Data</td>
<td></td>
<td>Under review</td>
</tr>
<tr>
<td>to Make Decisions</td>
<td></td>
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</tr>
<tr>
<td>Using Probability</td>
<td>Use probability to evaluate outcomes of decisions.</td>
<td>S.MD.7</td>
<td>Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).</td>
<td>Under review</td>
<td></td>
<td>Under review</td>
</tr>
<tr>
<td>to Make Decisions</td>
<td></td>
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</tbody>
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## Integrated Math I

### Conceptual Category: Number and Quantity

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<tr>
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</thead>
<tbody>
<tr>
<td>Quantities</td>
<td>Reason quantitatively and use units to solve problems.</td>
<td>N.Q.1</td>
<td>Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</td>
<td>Under review</td>
<td>Under review</td>
<td>Under review</td>
</tr>
<tr>
<td>Quantities</td>
<td>Reason quantitatively and use units to solve problems.</td>
<td>N.Q.2</td>
<td>Define appropriate quantities for the purpose of descriptive modeling.</td>
<td>Under review</td>
<td>Under review</td>
<td>Under review</td>
</tr>
<tr>
<td>Quantities</td>
<td>Reason quantitatively and use units to solve problems.</td>
<td>N.Q.3</td>
<td>Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</td>
<td>Number and Quantity</td>
<td>Error in Measurement Percentage Error</td>
<td>Decimals</td>
</tr>
</tbody>
</table>

### Conceptual Category: Algebra

| Seeing Structure in Expressions | Interpret the structure of expressions. | A.SSE.1.a | Interpret expressions that represent a quantity in terms of its context. Interpret parts of an expression, such as terms, factors, and coefficients. | Writing and Graphing Linear Equations | Gradients for Real Write an Equation: Word Problems | Under review |
| Seeing Structure in Expressions | Interpret the structure of expressions. | A.SSE.1.a | Interpret expressions that represent a quantity in terms of its context. Interpret parts of an expression, such as terms, factors, and coefficients. | Exponential Equations and Functions | Compound Interest by Formula Depreciation Declining Balance Depreciation | Depreciation Interest |
| Seeing Structure in Expressions | Interpret the structure of expressions. | A.SSE.1.b | Interpret expressions that represent a quantity in terms of its context. Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret \( P(1 + r)^n \) as the product of \( P \) and a factor not depending on \( P \). | Exponential Equations and Functions | Compound Interest by Formula Depreciation Declining Balance Depreciation | Depreciation Interest |
## Integrated Math I

**Conceptual Category: Algebra**

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<th>Domain</th>
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<th>eBooks</th>
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</thead>
<tbody>
<tr>
<td>Creating Equations</td>
<td>Create equations that describe numbers or relationships.</td>
<td>A.CED.1</td>
<td>Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.</td>
<td>Writing and Graphing Linear Equations</td>
<td>Writing Algebraic Expressions Equations to Solve Problems Writing Equations Write an Equation: Word Problems</td>
<td>Under review</td>
</tr>
<tr>
<td>Creating Equations</td>
<td>Create equations that describe numbers or relationships.</td>
<td>A.CED.1</td>
<td>Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.</td>
<td>Exponential Equations and Functions</td>
<td>Compound Interest by Formula Depreciation Declining Balance Depreciation</td>
<td>Depreciation Interest</td>
</tr>
<tr>
<td>Creating Equations</td>
<td>Create equations that describe numbers or relationships.</td>
<td>A.CED.2</td>
<td>Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</td>
<td>Writing and Graphing Linear Equations</td>
<td>Equation from Point and Gradient Equation from Two Points $y=mx$ Determining a Rule for a Line Modeling Linear Relationships</td>
<td>Linear Relationships Exponential and Power Graphs</td>
</tr>
<tr>
<td>Creating Equations</td>
<td>Create equations that describe numbers or relationships.</td>
<td>A.CED.2</td>
<td>Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</td>
<td>Writing and Graphing Linear Equations</td>
<td>Which Straight Line? Equation of a Line 1</td>
<td>Straight Lines</td>
</tr>
<tr>
<td>Creating Equations</td>
<td>Create equations that describe numbers or relationships.</td>
<td>A.CED.2</td>
<td>Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</td>
<td>Exponential Equations and Functions</td>
<td>Graphing Exponentials</td>
<td>Under review</td>
</tr>
<tr>
<td>Creating Equations</td>
<td>Create equations that describe numbers or relationships.</td>
<td>A.CED.3</td>
<td>Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.</td>
<td>Under review</td>
<td>Under review</td>
<td>Under review</td>
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<tr>
<td>Integrated Math I</td>
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</table>

**Conceptual Category: Algebra**

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</thead>
<tbody>
<tr>
<td>Creating Equations</td>
<td>Create equations that describe numbers or relationships.</td>
<td>A.CED.4</td>
<td>Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm’s law $V = IR$ to highlight resistance $R$.</td>
<td>Number and Quantity</td>
<td>Changing the Subject</td>
<td>Linear Relationships Depreciation</td>
</tr>
<tr>
<td>Reasoning with Equations and Inequalities</td>
<td>Understand solving equations as a process of reasoning and explain the reasoning.</td>
<td>A.REI.1</td>
<td>Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.</td>
<td>Exponential Equations and Functions</td>
<td>Exponent Laws and Algebra, Exponent Laws with Brackets</td>
<td>Exponents</td>
</tr>
<tr>
<td>Reasoning with Equations and Inequalities</td>
<td>Understand solving equations as a process of reasoning and explain the reasoning.</td>
<td>A.REI.1</td>
<td>Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.</td>
<td>Exponential Equations and Functions</td>
<td>Exponent Laws and Algebra, Exponent Laws with Brackets</td>
<td>Exponents</td>
</tr>
<tr>
<td>Reasoning with Equations and Inequalities</td>
<td>Understand solving equations as a process of reasoning and explain the reasoning.</td>
<td>A.REI.3</td>
<td>Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.</td>
<td>Equations</td>
<td>Solving Simple Equations, Solving More Equations, Solve Two-Step Equations, Equations with Grouping Symbols, Solve Multi-Step Equations, Equations: Variables, Both Sides, Equations with Decimals, Equations with Fractions</td>
<td>Equations, Equations and Inequalities</td>
</tr>
</tbody>
</table>
## Integrated Math I

### Conceptual Category: Algebra

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<th>eBooks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reasoning with Equations and Inequalities</td>
<td>Understand solving equations as a process of reasoning and explain the reasoning.</td>
<td>A.REI.3</td>
<td>Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.</td>
<td>Solving Linear Equations and Systems</td>
<td>Equations to Solve Problems</td>
<td>Under review</td>
</tr>
<tr>
<td>Reasoning with Equations and Inequalities</td>
<td>Solve equations and inequalities in one variable.</td>
<td>A.REI.3</td>
<td>Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.</td>
<td>Linear Inequalities</td>
<td>Inequalities</td>
<td>Under review</td>
</tr>
<tr>
<td>Reasoning with Equations and Inequalities</td>
<td>Solve systems of equations.</td>
<td>A.REI.5</td>
<td>Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.</td>
<td>Under review</td>
<td>Under review</td>
<td>Equations and Inequalities</td>
</tr>
<tr>
<td>Reasoning with Equations and Inequalities</td>
<td>Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.</td>
<td>A.REI.6</td>
<td>Solve systems of linear equations.</td>
<td>Solving Linear Equations and Systems</td>
<td>Solve Systems by Graphing</td>
<td>Under review</td>
</tr>
<tr>
<td>Reasoning with Equations and Inequalities</td>
<td>Represent and solve equations and inequalities graphically.</td>
<td>A.REI.10</td>
<td>Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).</td>
<td>Writing and Graphing Linear Equations</td>
<td>Reading Values from a Line</td>
<td>Under review</td>
</tr>
</tbody>
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<tr>
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<tr>
<td><strong>Conceptual Category: Algebra</strong></td>
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</tr>
<tr>
<td>Reasoning with Equations and Inequalities</td>
<td>Represent and solve equations and inequalities graphically.</td>
<td>A.REI.11</td>
<td>Explain why the (x)-coordinates of the points where the graphs of the equations (y = f(x)) and (y = g(x)) intersect are the solutions of the equation (f(x) = g(x)); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where (f(x)) and/or (g(x)) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.</td>
<td>Under review</td>
<td>Under review</td>
<td>Under review</td>
</tr>
<tr>
<td>Reasoning with Equations and Inequalities</td>
<td>Represent and solve equations and inequalities graphically.</td>
<td>A.REI.12</td>
<td>Graph the solutions to a linear inequality in two variables as a halfplane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.</td>
<td>Linear Inequalities</td>
<td>Linear Regions Intersecting Linear Regions</td>
<td>Under review</td>
</tr>
<tr>
<td><strong>Conceptual Category: Functions</strong></td>
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</tr>
<tr>
<td>Interpreting Functions</td>
<td>Understand the concept of a function and use function notation.</td>
<td>F.IF.1</td>
<td>Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If (f) is a function and (x) is an element of its domain, then (f(x)) denotes the output of (f) corresponding to the input (x). The graph of (f) is the graph of the equation (y = f(x)).</td>
<td>Functions and Sequences</td>
<td>Function Rules and Tables</td>
<td>Functions</td>
</tr>
<tr>
<td>Interpreting Functions</td>
<td>Understand the concept of a function and use function notation.</td>
<td>F.IF.2</td>
<td>Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.</td>
<td>Functions and Sequences</td>
<td>Function Notation 1 Function Notation 2 Function Notation 3</td>
<td>Functions</td>
</tr>
</tbody>
</table>
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</thead>
<tbody>
<tr>
<td>Interpreting Functions</td>
<td>Understand the concept of a function and use function notation.</td>
<td>F.IF.3</td>
<td>Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. For example, the Fibonacci sequence is defined recursively by $f(0)=f(1)=1, f(n + 1)=f(n) + f(n - 1)$ for $n \geq 1$.</td>
<td>Functions and Sequences</td>
<td></td>
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</tr>
<tr>
<td>Interpreting Functions</td>
<td>Interpret functions that arise in applications in terms of a context.</td>
<td>F.IF.4</td>
<td>For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.</td>
<td>Writing and Graphing Linear Equations</td>
<td></td>
<td>Linear Relationships</td>
</tr>
<tr>
<td>Interpreting Functions</td>
<td>Interpret functions that arise in applications in terms of a context.</td>
<td>F.IF.5</td>
<td>Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function $h(n)$ gives the number of person-hours it takes to assemble $n$ engines in a factory, then the positive integers would be an appropriate domain for the function.</td>
<td>Under review</td>
<td></td>
<td>Functions</td>
</tr>
<tr>
<td>Interpreting Functions</td>
<td>Interpret functions that arise in applications in terms of the context.</td>
<td>F.IF.6</td>
<td>Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.</td>
<td>Writing and Graphing Linear Equations</td>
<td></td>
<td>Equation from Two Points</td>
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<tbody>
<tr>
<td>Interpreting Functions</td>
<td>Analyze functions using different representations.</td>
<td>F.IF.7.a</td>
<td>Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. Graph linear and quadratic functions and show intercepts, maxima, and minima.</td>
<td>Writing and Graphing Linear Equations</td>
<td>Which Straight Line?</td>
<td>Linear Relationships</td>
</tr>
<tr>
<td>Interpreting Functions</td>
<td>Analyze functions using different representations.</td>
<td>F.IF.7.e</td>
<td>Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.</td>
<td>Exponential Equations and Functions</td>
<td>Graphing Exponentials</td>
<td>Exponential and Power Graphs</td>
</tr>
<tr>
<td>Interpreting Functions</td>
<td>Analyze functions using different representations.</td>
<td>F.IF.9</td>
<td>Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.</td>
<td>Under review</td>
<td>Under review</td>
<td>Exponential and Power Graphs</td>
</tr>
<tr>
<td>Building Functions</td>
<td>Build a function that models a relationship between two quantities.</td>
<td>F.BF.1.a</td>
<td>Write a function that describes a relationship between two quantities. Determine an explicit expression, a recursive process, or steps for calculation from a context.</td>
<td>Writing and Graphing Linear Equations</td>
<td>Modeling Linear Relationships</td>
<td>Under review</td>
</tr>
<tr>
<td>Building Functions</td>
<td>Build a function that models a relationship between two quantities.</td>
<td>F.BF.1.a</td>
<td>Write a function that describes a relationship between two quantities. Determine an explicit expression, a recursive process, or steps for calculation from a context.</td>
<td>Exponential Equations and Functions</td>
<td>Compound Interest Formula Depreciation Declining Balance Depreciation</td>
<td>Depreciation Interest</td>
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<tr>
<td>Domain</td>
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<tr>
<td>Building Functions</td>
<td>Build a function that models a relationship between two quantities.</td>
<td>F.BF.1.b</td>
<td>Write a function that describes a relationship between two quantities. Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.</td>
<td>Under review</td>
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</tr>
<tr>
<td>Building Functions</td>
<td>Build a function that models a relationship between two quantities.</td>
<td>F.BF.2</td>
<td>Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.</td>
<td>Functions and Sequences</td>
<td></td>
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</tr>
<tr>
<td>Building Functions</td>
<td>Build new functions from existing functions.</td>
<td>F.BF.3</td>
<td>Identify the effect on the graph of replacing ( f(x) ) by ( f(x) + k ), ( k f(x) ), ( f(kx) ), and ( f(x + k) ) for specific values of ( k ) (both positive and negative); find the value of ( k ) given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.</td>
<td>Writing and Graphing Linear Equations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Linear, Quadratic, and Exponential Models</td>
<td>Construct and compare linear, quadratic, and exponential models and solve problems.</td>
<td>F.LE.1.a</td>
<td>Distinguish between situations that can be modeled with linear functions and with exponential functions. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.</td>
<td>Under review</td>
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<tbody>
<tr>
<td>Linear, Quadratic, and Exponential Models</td>
<td>Construct and compare linear, quadratic, and exponential models and solve problems.</td>
<td>F.LE.1.b</td>
<td>Distinguish between situations that can be modeled with linear functions and with exponential functions. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.</td>
<td>Functions and Sequences</td>
<td>Terms: Arithmetic Progressions</td>
<td>Straight Lines, Sequences &amp; Series: Arithmetic</td>
</tr>
<tr>
<td>Linear, Quadratic, and Exponential Models</td>
<td>Construct and compare linear, quadratic, and exponential models and solve problems.</td>
<td>F.LE.1.c</td>
<td>Distinguish between situations that can be modeled with linear functions and with exponential functions. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.</td>
<td>Functions and Sequences</td>
<td>Terms: Geometric Progressions 1, Terms: Geometric Progressions 2</td>
<td>Depreciation Interest, Sequences &amp; Series: Geometric</td>
</tr>
<tr>
<td>Linear, Quadratic, and Exponential Models</td>
<td>Construct and compare linear, quadratic, and exponential models and solve problems.</td>
<td>F.LE.2</td>
<td>Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).</td>
<td>Functions and Sequences</td>
<td>Find the Function Rule</td>
<td>Sequences &amp; Series: Arithmetic</td>
</tr>
<tr>
<td>Linear, Quadratic, and Exponential Models</td>
<td>Construct and compare linear, quadratic, and exponential models and solve problems.</td>
<td>F.LE.2</td>
<td>Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).</td>
<td>Writing and Graphing Linear Equations</td>
<td>Equations to Solve Problems, Writing Equations, Write an Equation: Word Problems, Equation from Two Points, Equation of a Line 1, Modeling Linear Relationships</td>
<td>Under review</td>
</tr>
<tr>
<td>Linear, Quadratic, and Exponential Models</td>
<td>Construct and compare linear, quadratic, and exponential models and solve problems.</td>
<td>F.LE.2</td>
<td>Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).</td>
<td>Functions and Sequences</td>
<td>Terms: Geometric Progressions 2</td>
<td>Depreciation Interest, Sequences &amp; Series: Geometric</td>
</tr>
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<tr>
<td><strong>Conceptual Category: Functions</strong></td>
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</tr>
<tr>
<td>Linear, Quadratic, and Exponential Models</td>
<td>Construct and compare linear, quadratic, and exponential models and solve problems.</td>
<td>F.LE.3</td>
<td>Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.</td>
<td>Under review</td>
<td>Under review</td>
<td>Under review</td>
</tr>
<tr>
<td>Linear, Quadratic, and Exponential Models</td>
<td>Interpret expressions for functions in terms of the situation they model.</td>
<td>F.LE.5</td>
<td>Interpret the parameters in a linear or exponential function in terms of a context.</td>
<td>Writing and Graphing Linear Equations</td>
<td>Gradients for Real</td>
<td>Under review</td>
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<tr>
<td><strong>Conceptual Category: Geometry</strong></td>
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</tr>
<tr>
<td>Congruence</td>
<td>Experiment with transformations in the plane.</td>
<td>G.CO.1</td>
<td>Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.</td>
<td>Line and Angle Basics</td>
<td>What Line Am I? Classifying Angles Labelling Angles Angles in a Revolution</td>
<td>Under review</td>
</tr>
<tr>
<td>Congruence</td>
<td>Experiment with transformations in the plane.</td>
<td>G.CO.2</td>
<td>Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).</td>
<td>Rigid Transformations</td>
<td>Transformations: Coordinate Plane Rotations: Coordinate Plane</td>
<td>Under review</td>
</tr>
<tr>
<td>Congruence</td>
<td>Experiment with transformations in the plane.</td>
<td>G.CO.3</td>
<td>Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.</td>
<td>Rigid Transformations</td>
<td>Symmetry or Not? Rotational Symmetry</td>
<td>Under review</td>
</tr>
</tbody>
</table>
## Integrated Math I

### Conceptual Category: Geometry

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<thead>
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<tbody>
<tr>
<td>Congruence</td>
<td>Experiment with transformations in the plane.</td>
<td>G.CO.4</td>
<td>Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.</td>
<td>Under review</td>
<td>Under review</td>
<td>Under review</td>
</tr>
<tr>
<td>Congruence</td>
<td>Experiment with transformations in the plane.</td>
<td>G.CO.5</td>
<td>Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.</td>
<td>Under review</td>
<td>Under review</td>
<td>Under review</td>
</tr>
<tr>
<td>Congruence</td>
<td>Understand congruence in terms of rigid motions.</td>
<td>G.CO.6</td>
<td>Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.</td>
<td>Rigid Transformations</td>
<td>Congruent Figures (Grid) Congruent Figures (Dots)</td>
<td>Under review</td>
</tr>
<tr>
<td>Congruence</td>
<td>Understand congruence in terms of rigid motions.</td>
<td>G.CO.7</td>
<td>Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.</td>
<td>Rigid Transformations</td>
<td>Congruent Triangles</td>
<td>Similarity and Congruence</td>
</tr>
<tr>
<td>Congruence</td>
<td>Understand congruence in terms of rigid motions.</td>
<td>G.CO.8</td>
<td>Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.</td>
<td>Under review</td>
<td>Under review</td>
<td>Similarity and Congruence</td>
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### Integrated Math I

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<tbody>
<tr>
<td>Conceptual Category: Geometry</td>
<td>Congruence</td>
<td>G.CO.12</td>
<td>Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.</td>
<td>Under review</td>
<td>Under review</td>
<td>Constructions</td>
</tr>
<tr>
<td></td>
<td>Congruence</td>
<td>G.CO.13</td>
<td>Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.</td>
<td>Under review</td>
<td>Under review</td>
<td>Constructions</td>
</tr>
<tr>
<td></td>
<td>Expressing Geometric Properties with Equations</td>
<td>G.GPE.4</td>
<td>Use coordinates to prove simple geometric theorems algebraically. For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point (1, √3) lies on the circle centered at the origin and containing the point (0, 2).</td>
<td>Connecting Geometry and Algebra</td>
<td>Coordinate Geometry</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Expressing Geometric Properties with Equations</td>
<td>G.GPE.5</td>
<td>Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).</td>
<td>Connecting Geometry and Algebra</td>
<td>Are they Parallel? Are they Perpendicular? Perpendicular and Parallel Lines Equation of a Line</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Expressing Geometric Properties with Equations</td>
<td>G.GPE.7</td>
<td>Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.</td>
<td>Connecting Geometry and Algebra</td>
<td>Distance Between Two Points</td>
<td>Coordinate Geometry</td>
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# Integrated Math I

## Conceptual Category: Statistics and Probability

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<tbody>
<tr>
<td>Interpreting Categorical and Quantitative Data</td>
<td>Summarize, represent, and interpret data on a single count or measurement variable</td>
<td>S.ID.1</td>
<td>Represent data with plots on the real number line (dot plots, histograms, and box plots).</td>
<td>Descriptive Statistics</td>
<td>Dot Plots</td>
<td>Under review</td>
</tr>
<tr>
<td>Interpreting Categorical and Quantitative Data</td>
<td>Summarize, represent, and interpret data on a single count or measurement variable</td>
<td>S.ID.2</td>
<td>Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.</td>
<td>Descriptive Statistics</td>
<td>Mean</td>
<td>Under review</td>
</tr>
<tr>
<td>Interpreting Categorical and Quantitative Data</td>
<td>Summarize, represent, and interpret data on a single count or measurement variable</td>
<td>S.ID.3</td>
<td>Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).</td>
<td>Descriptive Statistics</td>
<td>Skewness of Data</td>
<td>Under review</td>
</tr>
<tr>
<td>Interpreting Categorical and Quantitative Data</td>
<td>Summarize, represent, and interpret data on two categorical and quantitative variables</td>
<td>S.ID.5</td>
<td>Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.</td>
<td>Under review</td>
<td>Under review</td>
<td>Under review</td>
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<tr>
<td>Domain</td>
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<tr>
<td>Conceptual Category: Statistics and Probability</td>
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<td></td>
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<td>Under review</td>
<td>Under review</td>
</tr>
<tr>
<td>Interpreting Categorical and Quantitative Data</td>
<td>Summarize, represent, and interpret data on two categorical and quantitative variables</td>
<td>S.ID.6.a</td>
<td>Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.</td>
<td>Under review</td>
<td>Under review</td>
<td>Under review</td>
</tr>
<tr>
<td>Interpreting Categorical and Quantitative Data</td>
<td>Summarize, represent, and interpret data on two categorical and quantitative variables</td>
<td>S.ID.6.b</td>
<td>Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. Informally assess the fit of a function by plotting and analyzing residuals.</td>
<td>Under review</td>
<td>Under review</td>
<td>Under review</td>
</tr>
<tr>
<td>Interpreting Categorical and Quantitative Data</td>
<td>Summarize, represent, and interpret data on two categorical and quantitative variables</td>
<td>S.ID.6.c</td>
<td>Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. Fit a linear function for a scatter plot that suggests a linear association.</td>
<td>Descriptive Statistics</td>
<td>Scatter Plots</td>
<td>Under review</td>
</tr>
<tr>
<td>Interpreting Categorical and Quantitative Data</td>
<td>Interpret linear models.</td>
<td>S.ID.7</td>
<td>Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.</td>
<td>Under review</td>
<td>Under review</td>
<td>Under review</td>
</tr>
<tr>
<td>Interpreting Categorical and Quantitative Data</td>
<td>Interpret linear models.</td>
<td>S.ID.8</td>
<td>Compute (using technology) and interpret the correlation coefficient of a linear fit.</td>
<td>Descriptive Statistics</td>
<td>Correlation</td>
<td>Under review</td>
</tr>
<tr>
<td>Interpreting Categorical and Quantitative Data</td>
<td>Interpret linear models.</td>
<td>S.ID.9</td>
<td>Distinguish between correlation and causation.</td>
<td>Under review</td>
<td>Under review</td>
<td>Under review</td>
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### Integrated Math II

**Conceptual Category: Number and Quantity**

<table>
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<tbody>
<tr>
<td><strong>The Real Number System</strong></td>
<td>Extend the properties of exponents to rational exponents.</td>
<td>N.RN.1</td>
<td>Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. For example, we define $5^{1/3}$ to be the cube root of 5 because we want $(5^{1/3})^3 = 5^{(1/3)3}$ to hold, so $(5^{1/3})^3$ must equal 5.</td>
<td>Exponents</td>
<td>Fractional Exponents</td>
<td>Irrational Number to Exponent Form Zero Exponents and Algebra</td>
</tr>
<tr>
<td><strong>The Real Number System</strong></td>
<td>Extend the properties of exponents to rational exponents.</td>
<td>N.RN.2</td>
<td>Rewrite expressions involving radicals and rational exponents using the properties of exponents.</td>
<td>Exponents</td>
<td>Fractional Exponents</td>
<td>Irrational Number to Exponent Form Zero Exponents and Algebra</td>
</tr>
<tr>
<td><strong>The Real Number System</strong></td>
<td>Use properties of rational and irrational numbers.</td>
<td>N.RN.3</td>
<td>Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.</td>
<td>Irrational Numbers</td>
<td>Adding and Subtracting Irrational Numbers</td>
<td>Multiplying Irrational Numbers</td>
</tr>
<tr>
<td><strong>The Complex Number System</strong></td>
<td>Perform arithmetic operations with complex numbers.</td>
<td>N.CN.1</td>
<td>Know there is a complex number $i$ such that $i^2 = -1$, and every complex number has the form $a + bi$ with $a$ and $b$ real.</td>
<td>Complex Numbers</td>
<td>Introduction to Complex Numbers</td>
<td>Under review</td>
</tr>
</tbody>
</table>
## Integrated Math II

### Conceptual Category: Number and Quantity

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</thead>
<tbody>
<tr>
<td>The Complex Number System</td>
<td>Perform arithmetic operations with complex numbers.</td>
<td>N.CN.2</td>
<td>Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.</td>
<td>Complex Numbers</td>
<td>Powers of $i$ Adding Complex Numbers Subtracting Complex Numbers Complex Multiplication</td>
<td>Under review</td>
</tr>
<tr>
<td>The Complex Number System</td>
<td>Use complex numbers in polynomial identities and equations.</td>
<td>N.CN.7</td>
<td>Solve quadratic equations with real coefficients that have complex solutions.</td>
<td>Under review</td>
<td>Under review</td>
<td>Under review</td>
</tr>
<tr>
<td>The Complex Number System</td>
<td>Use complex numbers in polynomial identities and equations.</td>
<td>N.CN.8</td>
<td>Extend polynomial identities to the complex numbers. For example, rewrite $x^2 + 4$ as $(x + 2i)(x - 2i)$.</td>
<td>Under review</td>
<td>Under review</td>
<td>Under review</td>
</tr>
<tr>
<td>The Complex Number System</td>
<td>Use complex numbers in polynomial identities and equations.</td>
<td>N.CN.9</td>
<td>Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials.</td>
<td>Under review</td>
<td>Under review</td>
<td>Under review</td>
</tr>
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</table>

### Conceptual Category: Algebra

| Seeing Structure in Expressions | Interpret the structure of expressions. | A.SSE.1.a | Interpret expressions that represent a quantity in terms of its context. Interpret parts of an expression, such as terms, factors, and coefficients. | Quadratic Functions and Equations | Vertex of a Parabola | Parabolas |
| Seeing Structure in Expressions | Interpret the structure of expressions. | A.SSE.1.b | Interpret expressions that represent a quantity in terms of its context. Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret $P(1 + r)^t$ as the product of $P$ and a factor not depending on $P$. | Quadratic Functions and Equations | The Discriminant Constructing Formulae Equations Reducible to Quadratics | Under review |
## Integrated Math II

### Conceptual Category: Algebra

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<tbody>
<tr>
<td>Seeing Structure in Expressions</td>
<td>Interpret the structure of expressions.</td>
<td>A.SSE.1.b</td>
<td>Interpret expressions that represent a quantity in terms of its context. Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret (P(1 + r)^n) as the product of (P) and a factor not depending on (P).</td>
<td>Exponents</td>
<td>Fractional Exponents Compound Interest by Formula Declining Balance Depreciation</td>
<td>Geometric Series in Finance</td>
</tr>
<tr>
<td>Seeing Structure in Expressions</td>
<td>Interpret the structure of expressions.</td>
<td>A.SSE.2</td>
<td>Use the structure of an expression to identify ways to rewrite it. For example, see (x^4 - y^4) as ((x^2)^2 - (y^2)^2), thus recognizing it as a difference of squares that can be factored as ((x^2 - y^2)(x^2 + y^2)).</td>
<td>Quadratic Functions and Equations</td>
<td>Factoring Quadratics 1 Factoring Quadratics 2 Equations Reducible to Quadratics</td>
<td>Expanding and Factorizing</td>
</tr>
<tr>
<td>Seeing Structure in Expressions</td>
<td>Write expressions in equivalent forms to solve problems.</td>
<td>A.SSE.3.a</td>
<td>Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. Factor a quadratic expression to reveal the zeros of the function it defines.</td>
<td>Solving Quadratic Equations</td>
<td>Highest Common Algebraic Factor Factoring Quadratics 1 Factoring Quadratics 2 Grouping in Pairs</td>
<td>Quadratic Equations</td>
</tr>
<tr>
<td>Seeing Structure in Expressions</td>
<td>Write expressions in equivalent forms to solve problems.</td>
<td>A.SSE.3.b</td>
<td>Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.</td>
<td>Quadratic Functions and Equations</td>
<td>Completing the Square Completing the Square 2 Vertex of a Parabola</td>
<td>Quadratic Equations</td>
</tr>
<tr>
<td>Seeing Structure in Expressions</td>
<td>Write expressions in equivalent forms to solve problems.</td>
<td>A.SSE.3.c</td>
<td>Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. Use the properties of exponents to transform expressions for exponential functions. For example the expression (1.15^t) can be rewritten as ((1.15^{1/12})^{12t} \approx 1.012^{12t}) to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.</td>
<td>Under review</td>
<td>Under review</td>
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### Conceptual Category: Algebra

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<tbody>
<tr>
<td><strong>Arithmetic with Polynomials and Rational Expressions</strong></td>
<td></td>
<td></td>
<td>Perform arithmetic operations on polynomials.</td>
<td>A.APR.1</td>
<td>Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.</td>
<td>Polynomial Arithmetic</td>
</tr>
<tr>
<td><strong>Creating Equations</strong></td>
<td></td>
<td></td>
<td>Create equations that describe numbers or relationships.</td>
<td>A.CED.1</td>
<td>Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.</td>
<td>Quadratic Functions and Equations</td>
</tr>
<tr>
<td><strong>Creating Equations</strong></td>
<td></td>
<td></td>
<td>Create equations that describe numbers or relationships.</td>
<td>A.CED.1</td>
<td>Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.</td>
<td>Exponents</td>
</tr>
<tr>
<td><strong>Creating Equations</strong></td>
<td></td>
<td></td>
<td>Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</td>
<td>A.CED.2</td>
<td>Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</td>
<td>Exponents Graphing Exponentials</td>
</tr>
<tr>
<td><strong>Creating Equations</strong></td>
<td></td>
<td></td>
<td>Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</td>
<td>A.CED.2</td>
<td>Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</td>
<td>Quadratic Functions and Equations</td>
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</tr>
<tr>
<td>Creating Equations</td>
<td>Create equations that describe numbers or relationships.</td>
<td>A.CED.4</td>
<td>Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm’s law ( V=IR ) to highlight resistance ( R ).</td>
<td>Functions</td>
<td>Changing the Subject</td>
<td>Linear Relationships Depreciation</td>
</tr>
<tr>
<td>Reasoning with Equations and Inequalities</td>
<td>Solve equations and inequalities in one variable.</td>
<td>A.REI.4.a</td>
<td>Solve quadratic equations in one variable. Use the method of completing the square to transform any quadratic equation in ( x ) into an equation of the form ((x-p)^2=q) that has the same solutions. Derive the quadratic formula from this form.</td>
<td>Solving Quadratic Equations</td>
<td>Quadratic Equations 1 Quadratic Equations 2</td>
<td>Quadratic Equations</td>
</tr>
<tr>
<td>Reasoning with Equations and Inequalities</td>
<td>Solve equations and inequalities in one variable.</td>
<td>A.REI.4.b</td>
<td>Solve quadratic equations in one variable. Solve quadratic equations by inspection (e.g., for ( x^2=49 )), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as ( a \pm bi ) for real numbers ( a ) and ( b ).</td>
<td>Solving Quadratic Equations</td>
<td>Quadratic Equations 1 Quadratic Equations 2 Quadratic Formula The Discriminant Factoring Quadratics 1 Factoring Quadratics 2 Checking Quadratic Equations</td>
<td>Equations and Inequalities Factorizing Quadratic Equations</td>
</tr>
<tr>
<td>Reasoning with Equations and Inequalities</td>
<td>Solve systems of equations.</td>
<td>A.REI.7</td>
<td>Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line ( y=-3x ) and the circle ( x^2 + y^2=3 ).</td>
<td>Linear and Quadratic Systems</td>
<td>Intersection: Line &amp; Parabola Simultaneous Equations 3 Intersection: Line &amp; Circle</td>
<td>Quadratic Equations</td>
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<tr>
<td>Conceptual Category: Functions</td>
<td></td>
<td></td>
<td>Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.</td>
<td>Quadratic Functions and Equations</td>
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</tr>
<tr>
<td>Interpreting Functions</td>
<td>Analyze functions using different representations.</td>
<td>F.IF.8.a</td>
<td>Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as $y=(1.02)^t$, $y=(0.97)^t$, $y=(1.01)^{12t}$, $y=(1.2)^{t/10}$, and classify them as representing exponential growth or decay.</td>
<td>Exponents</td>
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</tr>
<tr>
<td>Interpreting Functions</td>
<td>Analyze functions using different representations.</td>
<td>F.IF.8.b</td>
<td>Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.</td>
<td>Under review</td>
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</tr>
<tr>
<td>Interpreting Functions</td>
<td>Analyze functions using different representations.</td>
<td>F.IF.9</td>
<td>Write a function that describes a relationship between two quantities. Determine an explicit expression, a recursive process, or steps for calculation from a context.</td>
<td>Exponents</td>
<td>Compound Interest by Formula</td>
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<tr>
<td>Building Functions</td>
<td>Build a function that models a relationship between two quantities.</td>
<td>F.BF.1.a</td>
<td>Write a function that describes a relationship between two quantities. Determine an explicit expression, a recursive process, or steps for calculation from a context.</td>
<td>Depreciation Interest</td>
<td>Depreciation Declining Balance</td>
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</tr>
<tr>
<td>Building Functions</td>
<td>Build a function that models a relationship between two quantities.</td>
<td>F.BF.1.a</td>
<td>Write a function that describes a relationship between two quantities. Determine an explicit expression, a recursive process, or steps for calculation from a context.</td>
<td>Quadratic Functions and Equations</td>
<td>Constructing Formulae</td>
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## Integrated Math II

### Conceptual Category: Functions

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<tr>
<td>Building Functions</td>
<td>Build a function that models a relationship between two quantities.</td>
<td>F.BF.1.b</td>
<td>Write a function that describes a relationship between two quantities. Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.</td>
<td>Under review</td>
<td>Under review</td>
<td>Under review</td>
</tr>
<tr>
<td>Building Functions</td>
<td>Build new functions from existing functions.</td>
<td>F.BF.3</td>
<td>Identify the effect on the graph of replacing ( f(x) ) by ( f(x) + k ), ( kf(x) ), ( f(kx) ), and ( f(x + k) ) for specific values of ( k ) (both positive and negative); find the value of ( k ) given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.</td>
<td>Functions</td>
<td>Vertical and horizontal shift</td>
<td>Functions Parabolas Sketching Polynomials</td>
</tr>
<tr>
<td>Building Functions</td>
<td>Build new functions from existing functions.</td>
<td>F.BF.4.a</td>
<td>Find inverse functions. Solve an equation of the form ( f(x) = c ) for a simple function ( f ) that has an inverse and write an expression for the inverse. For example, ( f(x) = 2x^3 ) or ( f(x) = (x + 1)/(x - 1) ) for ( x \neq 1 ).</td>
<td>Functions</td>
<td>Inverse Functions</td>
<td>Functions</td>
</tr>
<tr>
<td>Linear, Quadratic, and Exponential Models</td>
<td>Construct and compare linear, quadratic, and exponential models and solve problems.</td>
<td>F.LE.3</td>
<td>Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.</td>
<td>Under review</td>
<td>Under review</td>
<td>Under review</td>
</tr>
<tr>
<td>Trigonometric Functions</td>
<td>Prove and apply trigonometric identities.</td>
<td>F.FT.8</td>
<td>Prove the Pythagorean identity ( \sin^2(\theta) + \cos^2(\theta) = 1 ) and use it to find ( \sin(\theta) ), ( \cos(\theta) ), or ( \tan(\theta) ) given ( \sin(\theta) ), ( \cos(\theta) ), or ( \tan(\theta) ) and the quadrant of the angle.</td>
<td>Under review</td>
<td>Under review</td>
<td>Under review</td>
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<tr>
<td><strong>Congruence</strong></td>
<td>Prove Geometric Theorems</td>
<td>G.CO.9</td>
<td>Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment’s endpoints.</td>
<td>Similarity, Congruence, and Theorems</td>
<td>Angles and Parallel Lines</td>
<td>Under review</td>
</tr>
<tr>
<td><strong>Congruence</strong></td>
<td>Prove Geometric Theorems</td>
<td>G.CO.10</td>
<td>Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.</td>
<td>Similarity, Congruence, and Theorems</td>
<td>Angle Measures in a Triangle Plane Figure Theorems Ratio of Intercepts</td>
<td>Polygons and Angles</td>
</tr>
<tr>
<td><strong>Congruence</strong></td>
<td>Prove geometric theorems.</td>
<td>G.CO.11</td>
<td>Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.</td>
<td>Similarity, Congruence, and Theorems</td>
<td>Plane Figure Theorems</td>
<td>Under review</td>
</tr>
<tr>
<td>Similarity, Right Triangles, and Trigonometry</td>
<td>Understand similarity in terms of similarity transformations.</td>
<td>G.SRT.1.a</td>
<td>Verify experimentally the properties of dilations given by a center and a scale factor: $a$. A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged.</td>
<td>Under review</td>
<td>Under review</td>
<td>Under review</td>
</tr>
<tr>
<td>Similarity, Right Triangles, and Trigonometry</td>
<td>Understand similarity in terms of similarity transformations.</td>
<td>G.SRT.1.b</td>
<td>Verify experimentally the properties of dilations given by a center and a scale factor: $b$. The dilation of a line segment is longer or shorter in the ratio given by the scale factor.</td>
<td>Similarity, Congruence, and Theorems</td>
<td>Scale Measurement Scale Factor</td>
<td>Under review</td>
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# Integrated Math II

## Conceptual Category: Geometry

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<tr>
<td><strong>Similarity</strong></td>
<td>Understand similarity in terms of similarity transformations.</td>
<td>G.SRT.2</td>
<td>Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.</td>
<td>Similarity, Congruence, and Theorems</td>
<td>Similar Figures 1</td>
<td>Similarity and Congruence</td>
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<td><strong>Right Triangles, and Trigonometry</strong></td>
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<tr>
<td><strong>Similarity</strong></td>
<td>Understand similarity in terms of similarity transformations.</td>
<td>G.SRT.3</td>
<td>Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.</td>
<td>Similarity, Congruence, and Theorems</td>
<td>Similarity Proofs</td>
<td>Similarity and Congruence</td>
</tr>
<tr>
<td><strong>Right Triangles, and Trigonometry</strong></td>
<td>Prove theorems involving similarity.</td>
<td>G.SRT.4</td>
<td>Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely, the Pythagorean Theorem proved using triangle similarity.</td>
<td>Similarity, Congruence, and Theorems</td>
<td>Ratio of Intercepts</td>
<td>Under review</td>
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<tr>
<td><strong>Similarity</strong></td>
<td>Prove theorems involving similarity.</td>
<td>G.SRT.5</td>
<td>Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.</td>
<td>Similarity, Congruence, and Theorems</td>
<td>Similar Figures Using Similar Triangles Using Similar Triangles 1</td>
<td>Similarity and Congruence</td>
</tr>
<tr>
<td><strong>Right Triangles, and Trigonometry</strong></td>
<td>Define trigonometric ratios and solve problems involving right triangles.</td>
<td>G.SRT.6</td>
<td>Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.</td>
<td>Trigonometry</td>
<td>Exact Trigonometric Ratios Sin A Cos A Tan A</td>
<td>Trigonometry</td>
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<tr>
<td><strong>Similarity</strong></td>
<td>Define trigonometric ratios and solve problems involving right triangles.</td>
<td>G.SRT.7</td>
<td>Explain and use the relationship between the sine and cosine of complementary angles.</td>
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<td>Under review</td>
<td>Trigonometric Relationships</td>
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<tr>
<td><strong>Right Triangles, and Trigonometry</strong></td>
<td>Define trigonometric ratios and solve problems involving right triangles.</td>
<td>G.SRT.8</td>
<td>Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.</td>
<td>Trigonometry</td>
<td>Find Unknown Sides Find Unknown Angles Elevation and Depression Trigonometry Problems 2</td>
<td>Pythagorean Theorem Trigonometry</td>
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<tr>
<td>Circles</td>
<td>Understand and apply theorems about circles.</td>
<td>G.C.1</td>
<td>Prove that all circles are similar.</td>
<td>Under review</td>
<td>Under review</td>
<td>Under review</td>
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<tr>
<td>Circles</td>
<td>Understand and apply theorems about circles.</td>
<td>G.C.2</td>
<td>Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.</td>
<td>Circles and Parabolas</td>
<td>Circle Theorem</td>
<td>Tangents and Secants Chords and Angles</td>
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<tr>
<td>Circles</td>
<td>Understand and apply theorems about circles.</td>
<td>G.C.3</td>
<td>Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.</td>
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<td>Under review</td>
<td>Constructions</td>
</tr>
<tr>
<td>Circles</td>
<td>Understand and apply theorems about circles.</td>
<td>G.C.4</td>
<td>Construct a tangent line from a point outside a given circle to the circle.</td>
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<td>Under review</td>
<td>Constructions</td>
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<tr>
<td>Circles</td>
<td>Find arc lengths and areas of sectors of circles.</td>
<td>G.C.5</td>
<td>Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.</td>
<td>Circles and Parabolas</td>
<td>Converting Radians and Degrees</td>
<td>Perimeter and Area</td>
</tr>
<tr>
<td>Expressing Geometric Properties with Equations</td>
<td>Translate between the geometric description and the equation for a conic section.</td>
<td>G.GPE.1</td>
<td>Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.</td>
<td>Circles and Parabolas</td>
<td>Centre and Radius 1</td>
<td>Circle Graphs</td>
</tr>
<tr>
<td>Expressing Geometric Properties with Equations</td>
<td>Translate between the geometric description and the equation for a conic section.</td>
<td>G.GPE.2</td>
<td>Derive the equation of a parabola given a focus and directrix.</td>
<td>Circles and Parabolas</td>
<td>Focus and Directrix 1</td>
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## Conceptual Category: Geometry

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<tr>
<td>Expressing Geometric Properties with Equations</td>
<td>Use coordinates to prove simple geometric theorems algebraically.</td>
<td>G.GPE.4</td>
<td>Use coordinates to prove simple geometric theorems algebraically. For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point ((1, \sqrt{3})) lies on the circle centered at the origin and containing the point ((0, 2)).</td>
<td>Circles and Parabolas</td>
<td>Coordinate Geometry</td>
<td>Circle Graphs</td>
</tr>
<tr>
<td>Expressing Geometric Properties with Equations</td>
<td>Use coordinates to prove simple geometric theorems algebraically.</td>
<td>G.GPE.6</td>
<td>Find the point on a directed line segment between two given points that partitions the segment in a given ratio.</td>
<td>Similarity, Congruence, and Theorems</td>
<td>Midpoint by Formula</td>
<td>Coordinate Geometry</td>
</tr>
<tr>
<td>Geometric Measurement and Dimension</td>
<td>Explain volume formulas and use them to solve problems.</td>
<td>G.GMD.1</td>
<td>Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments.</td>
<td>Under review</td>
<td>Under review</td>
<td>Under review</td>
</tr>
<tr>
<td>Geometric Measurement and Dimension</td>
<td>Explain volume formulas and use them to solve problems.</td>
<td>G.GMD.3</td>
<td>Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.</td>
<td>Three-Dimensional Figures</td>
<td>Volume: Cylinders</td>
<td>Measuring Solids</td>
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## Conceptual Category: Statistics and Probability

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<tr>
<td>Conditional Probability and the Rules of Probability</td>
<td>Understand independence and conditional probability and use them to interpret data.</td>
<td>S.CP.1</td>
<td>Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events (“or”, “and,” “not”).</td>
<td>Probability</td>
<td>Venn Diagrams</td>
<td>Probability</td>
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<td>Conditional Probability and the</td>
<td>Understand independence and</td>
<td>S.CP.2</td>
<td>Understand that two events $A$ and $B$ are independent if the probability of</td>
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<td>Probability</td>
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<td>Rules of Probability</td>
<td>conditional probability and</td>
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<td>$A$ and $B$ occurring together is the product of their probabilities, and use</td>
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<td></td>
<td>use them to interpret data.</td>
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<td>this characterization to determine if they are independent.</td>
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<tr>
<td>Conditional Probability and the</td>
<td>Understand independence and</td>
<td>S.CP.3</td>
<td>Understand the conditional probability of $A$ given $B$ as $P(A \text{ and } B) / P(B)$, and interpret independence of $A$ and $B$ as</td>
<td>Probability</td>
<td>Conditional Probability</td>
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<tr>
<td>Rules of Probability</td>
<td>conditional probability and</td>
<td></td>
<td>saying that the conditional probability of $A$ given $B$ is the same as the probability of $A$, and the conditional probability of $B$ given $A$ is the same as the probability of $B$.</td>
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<tr>
<td>Conditional Probability and the</td>
<td>Understand independence and</td>
<td>S.CP.4</td>
<td>Construct and interpret two-way frequency tables of data when two categories</td>
<td>Probability</td>
<td>Two-way Table Probability Tables</td>
<td>Probability</td>
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<tr>
<td>Rules of Probability</td>
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<td>are associated with each object being classified. Use the two-way table as a</td>
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<td></td>
<td>use them to interpret data.</td>
<td></td>
<td>sample space to decide if events are independent and to approximate conditional</td>
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</tr>
<tr>
<td>Conditional Probability and the</td>
<td>Understand independence and</td>
<td>S.CP.5</td>
<td>Recognize and explain the concepts of conditional probability and independence</td>
<td>Under review</td>
<td>Under review</td>
<td>Under review</td>
</tr>
<tr>
<td>Rules of Probability</td>
<td>conditional probability and</td>
<td></td>
<td>in everyday language and everyday situations. For example, compare the chance of having lung cancer if you are a smoker with the chance of being a smoker if you have lung cancer.</td>
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<td>use them to interpret data.</td>
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## Conceptual Category: Statistics and Probability

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<tr>
<td>Conditional Probability</td>
<td>and the Rules of Probability</td>
<td>S.CP6</td>
<td>Find the conditional probability of $A$ given $B$ as the fraction of $B$'s outcomes that also belong to $A$, and interpret the answer in terms of the model.</td>
<td>Probability</td>
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<td>Probability</td>
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<tr>
<td>Conditional Probability</td>
<td>and the Rules of Probability</td>
<td>S.CP7</td>
<td>Apply the Addition Rule, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$, and interpret the answer in terms of the model.</td>
<td>Probability - 'And' and 'Or'</td>
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<td>Probability</td>
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<tr>
<td>Conditional Probability</td>
<td>and the Rules of Probability</td>
<td>S.CP8</td>
<td>Apply the general Multiplication Rule in a uniform probability model, $P(A \text{ and } B) = P(A</td>
<td>B)P(B</td>
<td>A) = P(B</td>
<td>A)P(A</td>
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<tr>
<td>Probability</td>
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<tr>
<td>Conditional Probability</td>
<td>and the Rules of Probability</td>
<td>S.CP9</td>
<td>Use permutations and combinations to compute probabilities of compound events and solve problems.</td>
<td>Probability</td>
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<td>Probability</td>
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<tr>
<td>Using Probability to Make</td>
<td></td>
<td>S.MD.6</td>
<td>Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator).</td>
<td>Probability Fair Games</td>
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<tr>
<td>Decisions</td>
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<tr>
<td>Using Probability to Make</td>
<td></td>
<td>S.MD.7</td>
<td>Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).</td>
<td>Under review Under review Under review</td>
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<tr>
<td>Decisions</td>
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<tr>
<td>The Complex Number System</td>
<td>Use complex numbers in polynomial identities and equations.</td>
<td>N.CN.8</td>
<td>Use complex numbers in polynomial identities and equations.</td>
<td>Solving Higher Order Equations</td>
<td>Complex Conjugate</td>
<td>Under review</td>
</tr>
<tr>
<td>The Complex Number System</td>
<td>Use complex numbers in polynomial identities and equations.</td>
<td>N.CN.9</td>
<td>Use complex numbers in polynomial identities and equations.</td>
<td>Under review</td>
<td>Under review</td>
<td>Under review</td>
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</tr>
<tr>
<td>Seeing Structure in Expressions</td>
<td>Interpret the structure of expressions.</td>
<td>A.SSE.1.a</td>
<td>Interpret expressions that represent a quantity in terms of its context. Interpret parts of an expression, such as terms, factors, and coefficients.</td>
<td>Modeling with Functions</td>
<td>Gradients for Real Exponential Growth and Decay</td>
<td>Sketching Polynomials</td>
</tr>
<tr>
<td>Seeing Structure in Expressions</td>
<td>Interpret the structure of expressions.</td>
<td>A.SSE.1.b</td>
<td>Interpret expressions that represent a quantity in terms of its context. Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret ( P(1 + r)^n ) as the product of ( P ) and a factor not depending on ( P ).</td>
<td>Solving Higher Order Equations</td>
<td>Factoring Expressions Equations Reducible to Quadratics</td>
<td>Geometric Series in Finance</td>
</tr>
<tr>
<td>Seeing Structure in Expressions</td>
<td>Interpret the structure of expressions.</td>
<td>A.SSE.2</td>
<td>Use the structure of an expression to identify ways to rewrite it. For example, see ( x^n - y^n ) as ((x^2)^n - (y^2)^n), thus recognizing it as a difference of squares that can be factored as ((x^2 - y^2)(x^2 + y^2)).</td>
<td>Solving Higher Order Equations</td>
<td>Equations Reducible to Quadratics</td>
<td>Factorizing</td>
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<tr>
<td>Seeing Structure in Expressions</td>
<td>Write expressions in equivalent forms to solve problems.</td>
<td>A.SSE.4</td>
<td>Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. For example, calculate mortgage payments.</td>
<td>Sequences and Series</td>
<td>Sum: Geometric Progressions Sigma Notation 1 Sigma Notation 2</td>
<td>Sequences &amp; Series: Geometric Progressions Geometric Series and Loan Repayments Geometric Series in Finance</td>
</tr>
<tr>
<td>Arithmetic with Polynomials and Rational Expressions</td>
<td>Perform arithmetic operations on polynomials.</td>
<td>A.APR.1</td>
<td>Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.</td>
<td>Polynomial Arithmetic</td>
<td>Like Terms: Add, Subtract Algebraic Multiplication Multiplication with Exponents Special Binomial Products Expanding Brackets Expand then Simplify Expanding Binomial Products</td>
<td>Polynomials Equations Expanding and Factorizing Simplifying Algebra Binomials and Pascal’s Triangle</td>
</tr>
<tr>
<td>Arithmetic with Polynomials and Rational Expressions</td>
<td>&quot;Understand the relationship between zeros and factors of polynomials.&quot;</td>
<td>A.APR.2</td>
<td>Know and apply the Remainder Theorem: For a polynomial ( p(x) ) and a number ( a ), the remainder on division by ( x - a ) is ( p(a) ), so ( p(a) = 0 ) if and only if ( (x - a) ) is a factor of ( p(x) ).</td>
<td>Solving Higher Order Equations</td>
<td>Polynomial Factor Theorem</td>
<td>Polynomial Factor Theorem</td>
</tr>
<tr>
<td>Arithmetic with Polynomials and Rational Expressions</td>
<td>&quot;Understand the relationship between zeros and factors of polynomials.&quot;</td>
<td>A.APR.3</td>
<td>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.</td>
<td>Solving Higher Order Equations</td>
<td>Factoring Expressions Equations Reducible to Quadratics Polynomial Factor Theorem Graphing Cubics</td>
<td>Factorizing Polynomials Sketching Polynomials</td>
</tr>
<tr>
<td>Arithmetic with Polynomials and Rational Expressions</td>
<td>Use polynomial identities to solve problems.</td>
<td>A.APR.4</td>
<td>Prove polynomial identities and use them to describe numerical relationships.</td>
<td>Solving Higher Order Equations</td>
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**Conceptual Category: Algebra**

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<tbody>
<tr>
<td>Arithmetic with Polynomials and Rational Expressions</td>
<td>Use polynomial identities to solve problems.</td>
<td>A.APR.5</td>
<td>Know and apply the Binomial Theorem for the expansion of ((x + y)^n) in powers of (x) and (y) for a positive integer (n), where (x) and (y) are any numbers, with coefficients determined for example by Pascal's Triangle.</td>
<td>Polynomial Arithmetic</td>
<td>Pascal's Triangle, Expansion</td>
<td>The Binomial Theorem Binomials and Pascal's Triangle</td>
</tr>
<tr>
<td>Arithmetic with Polynomials and Rational Expressions</td>
<td>Rewrite rational expressions.</td>
<td>A.APR.6</td>
<td>Rewrite simple rational expressions in different forms; write (a(x)/b(x)) in the form (q(x) + r(x)/b(x)), where (a(x), b(x), q(x),) and (r(x)) are polynomials with the degree of (r(x)) less than the degree of (b(x)), using inspection, long division, or, for the more complicated examples, a computer algebra system.</td>
<td>Polynomial Arithmetic</td>
<td>Polynomial Long Division Simplifying Binomial Expressions</td>
<td>Polynomials</td>
</tr>
<tr>
<td>Arithmetic with Polynomials and Rational Expressions</td>
<td>Rewrite rational expressions.</td>
<td>A.APR.7</td>
<td>Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.</td>
<td>Rational Equations</td>
<td>Algebraic Fractions 2 Algebraic Fractions 3 Factoring and Fractions 1 Factoring and Fractions 2</td>
<td>Factorizing</td>
</tr>
<tr>
<td>Creating Equations</td>
<td>Create equations that describe numbers or relationships.</td>
<td>A.CED.1</td>
<td>Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.</td>
<td>Modeling with Functions</td>
<td>Write an Equation: Word Problems</td>
<td>Under review</td>
</tr>
<tr>
<td>Creating Equations</td>
<td>Create equations that describe numbers or relationships.</td>
<td>A.CED.2</td>
<td>Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</td>
<td>Modeling with Functions</td>
<td>(y=ax) Find the Function Rule Modeling Linear Relationships Linear Modeling Parabolas and Marbles Parabolas and Rectangles Constructing Formulae</td>
<td>Under review</td>
</tr>
<tr>
<td>Domain</td>
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<tr>
<td>Conceptual Category: Algebra</td>
<td>Creating Equations</td>
<td>Create equations that describe numbers or relationships.</td>
<td>Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.</td>
<td>Under review</td>
<td>Under review</td>
<td>Under review</td>
</tr>
<tr>
<td>Creating Equations</td>
<td>Create equations that describe numbers or relationships.</td>
<td>A.CED.3</td>
<td>Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law $V=IR$ to highlight resistance $R$.</td>
<td>Inverse Functions</td>
<td>Inverse Functions</td>
<td>Graphing Functions</td>
</tr>
<tr>
<td>Reasoning with Equations and Inequalities</td>
<td>Understand solving equations as a process of reasoning and explain the reasoning.</td>
<td>A.REI.2</td>
<td>Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.</td>
<td>Radical Equations</td>
<td>Equations with Square Roots</td>
<td>Equations with Cube Roots</td>
</tr>
<tr>
<td>Reasoning with Equations and Inequalities</td>
<td>Represent and solve equations and inequalities graphically.</td>
<td>A.REI.11</td>
<td>Explain why the $x$-coordinates of the points where the graphs of the equations $y=f(x)$ and $y=g(x)$ intersect are the solutions of the equation $f(x)=g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.</td>
<td>Solving Higher Order Equations</td>
<td>Solve Systems by Graphing</td>
<td>Under review</td>
</tr>
<tr>
<td>Domain</td>
<td>Cluster</td>
<td>Standard</td>
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<td>Topic</td>
<td>Activities</td>
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<tr>
<td><strong>Interpreting</strong></td>
<td>Functions that arise in applications in terms of a context.</td>
<td>F.IF.4</td>
<td>For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.</td>
<td>Modeling with Functions</td>
<td>Gradients for Real Parabolas and Marbles Parabolas and Rectangles</td>
<td>Sketching Polynomials</td>
</tr>
<tr>
<td><strong>Interpreting</strong></td>
<td>Functions that arise in applications in terms of a context.</td>
<td>F.IF.5</td>
<td>Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function ( h(n) ) gives the number of person-hours it takes to assemble ( n ) engines in a factory, then the positive integers would be an appropriate domain for the function.</td>
<td>Modeling with Functions</td>
<td>Domain Domain and Range</td>
<td>Functions</td>
</tr>
<tr>
<td><strong>Interpreting</strong></td>
<td>Functions that arise in applications in terms of the context.</td>
<td>F.IF.6</td>
<td>Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.</td>
<td>Modeling with Functions</td>
<td>Equation from Two Points</td>
<td>Under review</td>
</tr>
<tr>
<td><strong>Interpreting</strong></td>
<td>Analyze functions using different representations.</td>
<td>F.IF.7.b</td>
<td>Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.</td>
<td>Inverse Functions</td>
<td>Graph Inverse Functions</td>
<td>Under review</td>
</tr>
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<td></td>
<td>Modeling with Functions</td>
<td>Absolute Value Graphs Piecemeal Functions Step Graphs</td>
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<tbody>
<tr>
<td>Interpreting</td>
<td>Analyze functions using different</td>
<td>F.IF.7.a</td>
<td>Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.</td>
<td>Polynomial Arithmetic</td>
<td>Polynomial Long Division</td>
<td>Simple Nonlinear Graphs</td>
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<tr>
<td>Functions</td>
<td>using different representations.</td>
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<td>Simplifying Binomial</td>
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<tr>
<td>Interpreting</td>
<td>Analyze functions using different</td>
<td>F.IF.7.b</td>
<td>Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as ( y=(1.02)^t ), ( y=(0.97)^t ), ( y=(1.01)^{12t} ), ( y=(1.2)^{10} ), and classify them as representing exponential growth or decay.</td>
<td>Exponents and Logarithms</td>
<td>Exponential Exponentials</td>
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<tr>
<td>Functions</td>
<td>using different representations.</td>
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<td></td>
<td>Exponential or Log Graph?</td>
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<tr>
<td>Interpreting</td>
<td>Analyze functions using different</td>
<td>F.IF.7.c</td>
<td>Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.</td>
<td>Solving Higher Order</td>
<td>Graphing Cubics</td>
<td>Sketching Polynomials</td>
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<tr>
<td>Interpreting</td>
<td>Analyze functions using different</td>
<td>F.IF.7.e</td>
<td>Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.</td>
<td>Trigonometry</td>
<td>Sine and Cosine Curves</td>
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<td>Functions</td>
<td>using different representations.</td>
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<td>Trig Graphs in Radians</td>
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<td>Graph Inverse Trig Functions</td>
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<tr>
<td>Functions</td>
<td>using different representations.</td>
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<tr>
<td>Interpreting</td>
<td>Functions</td>
<td>F.IF.9</td>
<td>Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.</td>
<td>Under review</td>
<td>Under review</td>
<td>Under review</td>
</tr>
<tr>
<td>Building</td>
<td>Functions</td>
<td>F.BF.1.b</td>
<td>Write a function that describes a relationship between two quantities. Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.</td>
<td>Under review</td>
<td>Under review</td>
<td>Under review</td>
</tr>
<tr>
<td>Building</td>
<td>Functions</td>
<td>F.BF.3</td>
<td>Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $kf(x)$, $f(kx)$, and $f(x + k)$ for specific values of $k$ (both positive and negative); find the value of $k$ given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.</td>
<td>Modeling with Functions</td>
<td>Odd and Even Functions</td>
<td>Exponential and Power Functions Sketching Polynomials</td>
</tr>
<tr>
<td>Building</td>
<td>Functions</td>
<td>F.BF.4.a</td>
<td>Find inverse functions. Solve an equation of the form $f(x) = c$ for a simple function $f$ that has an inverse and write an expression for the inverse. For example, $f(x) = 2x^2$ or $f(x) = (x + 1)/(x - 1)$ for $x \neq 1$.</td>
<td>Inverse Functions</td>
<td>Inverse Functions</td>
<td>Functions</td>
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<tr>
<td>Linear, Quadratic, and Exponential Models</td>
<td>Construct and compare linear, quadratic, and exponential models and solve problems.</td>
<td>F.LE.4</td>
<td>For exponential models, express as a logarithm the solution to ( ab^c=d ) where ( a, c, ) and ( d ) are numbers and the base ( b ) is 2, 10, or ( e ); evaluate the logarithm using technology.</td>
<td>Exponents and Logarithms</td>
<td>Log Laws</td>
<td>Log Base ‘e’</td>
</tr>
<tr>
<td>Trigonometric Functions</td>
<td>Extend the domain of trigonometric functions using the unit circle.</td>
<td>F.TF.1</td>
<td>Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.</td>
<td>Trigonometry</td>
<td>Converting Radians and Degrees</td>
<td>Unit Circle Reductions</td>
</tr>
<tr>
<td>Trigonometric Functions</td>
<td>Extend the domain of trigonometric functions using the unit circle.</td>
<td>F.TF.2</td>
<td>Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.</td>
<td>Trigonometry</td>
<td>Sign of the Angle</td>
<td>Unit Circle Reductions</td>
</tr>
<tr>
<td>Trigonometric Functions</td>
<td>Model periodic phenomena with trigonometric functions.</td>
<td>F.TF.5</td>
<td>Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.</td>
<td>Trigonometry</td>
<td>Period and Amplitude</td>
<td>Under review</td>
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### Conceptual Category: Geometry

| Similarity, Right Triangles, and Trigonometry | Apply trigonometry to general triangles. | G.SRT.9 | Derive the formula \( A = \frac{1}{2} ab \sin(C) \) for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side. | Trigonometry | Area Rule 1 | Area Rule 2 | Non Right Angled Triangles |
| Similarity, Right Triangles, and Trigonometry | Apply trigonometry to general triangles. | G.SRT.10 | Prove the Laws of Sines and Cosines and use them to solve problems. | Trigonometry | Sine Rule 1 | Cosine Rule 1 | Non Right Angled Triangles |
| Similarity, Right Triangles, and Trigonometry | Apply trigonometry to general triangles. | G.SRT.11 | Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces). | Trigonometry | Sine Rule 1 | Cosine Rule 1 | Non Right Angled Triangles |
## CCSS Standards Alignment with Mathletics

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</tr>
<tr>
<td>Geometric Measurement and Dimension</td>
<td>Visualize relationships between two-dimensional and three-dimensional objects.</td>
<td>G.GMD.4</td>
<td>Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.</td>
<td>Three-Dimensional Figures</td>
<td>Relate Shapes and Solids Nets</td>
<td>Under review</td>
</tr>
<tr>
<td>Modeling with Geometry</td>
<td>Apply geometric concepts in modeling situations.</td>
<td>G.MG.1</td>
<td>Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).</td>
<td>Three-Dimensional Figures</td>
<td>Match the Solid 2</td>
<td>Measuring Solids</td>
</tr>
<tr>
<td>Modeling with Geometry</td>
<td>Apply geometric concepts in modeling situations.</td>
<td>G.MG.2</td>
<td>Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).</td>
<td>Under review</td>
<td>Under review</td>
<td>Under review</td>
</tr>
<tr>
<td>Modeling with Geometry</td>
<td>Apply geometric concepts in modeling situations.</td>
<td>G.MG.3</td>
<td>Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).</td>
<td>Trigonometry</td>
<td>Trigonometry Problems 2</td>
<td>Under review</td>
</tr>
<tr>
<td><strong>Conceptual Category: Statistics and Probability</strong></td>
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<tr>
<td>Interpreting Categorical and Quantitative Data</td>
<td>Summarize, represent, and interpret data on a single count or measurement variable</td>
<td>S.ID.4</td>
<td>Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.</td>
<td>Collecting and Analyzing Data</td>
<td>Normal Distribution Normal Distribution Probability Calculating Standard Deviation Calculating z-scores Comparing z-scores Equivalent z-scores</td>
<td>Interpreting Data</td>
</tr>
<tr>
<td>Making Inferences and Justifying Conclusions</td>
<td>Understand and evaluate random processes underlying statistical experiments.</td>
<td>S.IC.1</td>
<td>Understand statistics as a process for making inferences about population parameters based on a random sample from that population.</td>
<td>Collecting and Analyzing Data</td>
<td>Capture Recapture Technique</td>
<td>Under review</td>
</tr>
</tbody>
</table>
# Integrated Math III

## Conceptual Category: Statistics and Probability

<table>
<thead>
<tr>
<th>Domain</th>
<th>Cluster</th>
<th>Standard</th>
<th>Description</th>
<th>Topic</th>
<th>Activities</th>
<th>eBooks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Making Inferences and Justifying Conclusions</td>
<td>Understand and evaluate random processes underlying statistical experiments.</td>
<td>S.IC.2</td>
<td>Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation. For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model?</td>
<td>Under review</td>
<td>Under review</td>
<td>Under review</td>
</tr>
<tr>
<td>Making Inferences and Justifying Conclusions</td>
<td>Make inferences and justify conclusions from sample surveys, experiments, and observational studies.</td>
<td>S.IC.3</td>
<td>Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.</td>
<td>Under review</td>
<td>Under review</td>
<td>Under review</td>
</tr>
<tr>
<td>Making Inferences and Justifying Conclusions</td>
<td>Make inferences and justify conclusions from sample surveys, experiments, and observational studies.</td>
<td>S.IC.4</td>
<td>Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.</td>
<td>Under review</td>
<td>Under review</td>
<td>Under review</td>
</tr>
<tr>
<td>Making Inferences and Justifying Conclusions</td>
<td>Make inferences and justify conclusions from sample surveys, experiments, and observational studies.</td>
<td>S.IC.5</td>
<td>Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.</td>
<td>Under review</td>
<td>Under review</td>
<td>Under review</td>
</tr>
<tr>
<td>Making Inferences and Justifying Conclusions</td>
<td>Make inferences and justify conclusions from sample surveys, experiments, and observational studies.</td>
<td>S.IC.6</td>
<td>Evaluate reports based on data.</td>
<td>Under review</td>
<td>Under review</td>
<td>Under review</td>
</tr>
<tr>
<td>Using Probability to Make Decisions</td>
<td>Use probability to evaluate outcomes of decisions.</td>
<td>S.MD.6</td>
<td>Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator).</td>
<td>Collecting and Analyzing Data</td>
<td>Fair Games</td>
<td>Under review</td>
</tr>
<tr>
<td>Using Probability to Make Decisions</td>
<td>Use probability to evaluate outcomes of decisions.</td>
<td>S.MD.7</td>
<td>Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).</td>
<td>Under review</td>
<td>Under review</td>
<td>Under review</td>
</tr>
</tbody>
</table>