

A Correlation of
INVESTIGATIONS 
IN NUMBER, DATA, AND SPACE®



To

Virginia Public Schools
Mathematics Standards of Learning
Grades K-5

**A Correlation of Investigations 3 in Number, Data, and Space ©2017
to the Virginia Public Schools Mathematics Standards of Learning**

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Kindergarten Units

Unit 1 - Counting People, Sorting Buttons

Unit 2 - Counting Quantities, Comparing Lengths

Unit 3 - Make a Shape, Fill a Hexagon

Unit 4 - Collect, Count and Measure

Unit 5 - Build a Block, Build a Wall

Unit 6 - How Many Now?

Unit 7 - How Many Noses? How Many Eyes?

Unit 8 - Ten Frames and Teen Numbers

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<p align="center">Mathematics Standards of Learning for Virginia Public Schools Kindergarten</p>	<p align="center">Investigations 3 in Number, Data, and Space ©2017 Kindergarten</p>
<p>Mathematical Process Goals for Students</p>	
<p>Mathematical Problem Solving Students will apply mathematical concepts and skills and the relationships among them to solve problem situations of varying complexities. Students also will recognize and create problems from real-world data and situations within and outside mathematics and then apply appropriate strategies to determine acceptable solutions. To accomplish this goal, students will need to develop a repertoire of skills and strategies for solving a variety of problem types. A major goal of the mathematics program is to help students apply mathematics concepts and skills to become mathematical problem solvers.</p>	<p>Unit 1: 1.1, 1.2, 1.5, 2.1, 2.3, 3.1, 3.2, 3.4 Unit 4: 1.2, 1.3, 1.5, 1.6, 2.2, 2.3, 3.3, 3.4 Unit 7: 1.1, 1.2, 2.2, 2.3, 3.1, 3.2, 3.4, 3.8</p>
<p>Mathematical Communication Students will communicate thinking and reasoning using the language of mathematics, including specialized vocabulary and symbolic notation, to express mathematical ideas with precision. Representing, discussing, justifying, conjecturing, reading, writing, presenting, and listening to mathematics will help students to clarify their thinking and deepen their understanding of the mathematics being studied. Mathematical communication becomes visible where learning involves participation in mathematical discussions.</p>	<p>Unit 5: 1.2, 1.3, 1.4, 1.6, 1.7 Unit 6: 1.1, 1.4, 1.5, 2.2, 2.6, 3.2</p>
<p>Mathematical Reasoning Students will recognize reasoning and proof as fundamental aspects of mathematics. Students will learn and apply inductive and deductive reasoning skills to make, test, and evaluate mathematical statements and to justify steps in mathematical procedures. Students will use logical reasoning to analyze an argument and to determine whether conclusions are valid. In addition, students will use number sense to apply proportional and spatial reasoning and to reason from a variety of representations.</p>	<p>Unit 4: 1.2, 1.3, 1.5, 1.6, 2.2, 2.3, 3.3, 3.4, 3.5, 3.6 Unit 7: 1.1, 1.2, 1.4, 2.2, 3.3, 3.4, 3.5, 3.7, 3.8</p>

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<p align="center">Mathematics Standards of Learning for Virginia Public Schools Kindergarten</p>	<p align="center">Investigations 3 in Number, Data, and Space ©2017 Kindergarten</p>
<p>Mathematical Connections Students will build upon prior knowledge to relate concepts and procedures from different topics within mathematics and see mathematics as an integrated field of study. Through the practical application of content and process skills, students will make connections among different areas of mathematics and between mathematics and other disciplines, and to real-world contexts. Science and mathematics teachers and curriculum writers are encouraged to develop mathematics and science curricula that support, apply, and reinforce each other.</p>	<p>Unit 3: 1.1, 1.2, 1.3, 1.5, 2.1 Unit 8: 1.2, 1.3, 1.7, 2.3, 2.5, 3.1, 3.4</p>
<p>Mathematical Representations Students will represent and describe mathematical ideas, generalizations, and relationships using a variety of methods. Students will understand that representations of mathematical ideas are an essential part of learning, doing, and communicating mathematics. Students should make connections among different representations – physical, visual, symbolic, verbal, and contextual – and recognize that representation is both a process and a product.</p>	<p>Unit 2: 1.1, 1.3, 1.4, 1.9, 2.1, 2.6 Unit 5: 1.1, 1.2, 1.7</p>
<p>Number and Number Sense</p>	
<p>K.1 The student will</p>	
<p>a) tell how many are in a given set of 20 or fewer objects by counting orally; and</p>	<p>Unit 1: 1.1, 1.2, 1.4, 1.5, 2.3, 2.4, 3.2, 3.6 Unit 2: 1.1, 1.3, 1.8, 1.10, 2.4, 2.7, 2.11 Unit 3: 1.2, 1.3, 1.5, 2.1, 2.3, 2.5, 2.6, 2.7 Unit 4: 1.3, 1.6, 1.9, 2.2, 2.5, 2.7, 3.1, 3.4 Unit 5: 1.2, 1.3, 1.4, 1.5, 1.7, 1.8, 1.9, 1.10 Unit 6: 1.1, 1.3, 1.5, 2.4, 2.7, 2.8, 3.1, 3.6 Unit 7: 1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 3.3, 3.7 Unit 8: 1.3, 1.4, 1.7, 2.1, 2.4, 2.6, 3.4, 3.5</p>

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b) read, write, and represent numbers from 0 through 20.	Unit 1: 3.2, 3.3, 3.4, 3.5, 3.6 Unit 2: 1.2, 1.3, 1.4, 1.9, 2.2, 2.4, 2.7, 2.10 Unit 3: 1.2, 1.4, 1.5, 2.2, 2.4, 2.5, 2.6 Unit 4: 1.2, 1.3, 1.5, 1.10, 2.2, 2.4, 2.7, 3.3 Unit 5: 1.2, 1.4, 1.5, 1.7, 1.8, 1.9, 1.10 Unit 6: 1.1, 1.4, 1.6, 2.1, 2.3, 2.7, 3.1, 3.6 Unit 7: 1.2, 1.3, 2.2, 2.3, 3.1, 3.4, 3.6, 3.8 Unit 8: 1.2, 1.4, 1.6, 2.1, 2.3, 2.5, 3.1, 3.3
K.2 The student, given no more than three sets, each set containing 10 or fewer concrete objects, will	
a) compare and describe one set as having more, fewer, or the same number of objects as the other set(s); and	Unit 1: 2.1, 2.2, 2.5, 3.1, 3.3, 3.4, 3.5, 3.6 Unit 2: 1.2, 1.5, 1.7, 1.9, 2.1, 2.4, 2.7, 2.12 Unit 3: 1.1, 1.2, 1.4, 1.5, 2.3, 2.5, 2.6, 2.7 Unit 4: 1.3, 1.4, 1.6, 1.10, 2.2, 2.5, 2.7, 3.2 Unit 5: 1.2, 1.3, 1.4, 1.5, 1.7, 1.8, 1.9, 1.10 Unit 6: 1.2, 1.4, 1.6, 2.3, 2.7, 2.8, 3.2, 3.5 Unit 7: 2.1, 2.2, 2.3, 3.2, 3.4, 3.5, 3.6, 3.8 Unit 8: 1.5, 1.6, 1.7, 2.3, 2.7, 2.10, 3.3, 3.5
b) compare and order sets from least to greatest and greatest to least.	For related content, please see: Unit 2: 2.6, 2.10, 2.11, 2.12 Unit 4: 2.4, 2.7 Unit 6: 2.2, 2.3
K.3 The student will	
a) count forward orally by ones from 0 to 100;	Unit 1: 1.1, 1.4, 1.5, 2.1, 2.3, 2.5, 3.2, 3.6 Unit 2: 1.1, 1.6, 1.9, 2.2, 2.5, 2.8, 2.11 Unit 3: 1.2, 1.3, 1.5, 2.1, 2.3, 2.5, 2.7 Unit 4: 1.3, 1.5, 1.9, 2.3, 2.6, 2.7, 3.2, 3.4 Unit 5: 1.3, 1.5, 1.7, 1.8, 1.9, 1.10 Unit 6: 1.1, 1.3, 1.6, 2.1, 2.3, 2.5, 3.2, 3.4 Unit 7: 2.1, 2.2, 2.3, 3.1, 3.3, 3.5, 3.7, 3.8 Unit 8: 1.6, 1.7, 2.2, 2.8, 3.2, 3.5
b) count backward orally by ones when given any number between 1 and 10;	Unit 5: 1.10

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c) identify the number after, without counting, when given any number between 0 and 100 and identify the number before, without counting, when given any number between 1 and 10; and	Unit 1: 1.1, 1.2, 1.3, 1.5, 2.1, 2.5 Unit 2: 1.1 Unit 4: 1.3, 1.6, 1.7, 1.8, 1.10, 2.3, 2.5, 2.7, 3.1, 3.5, 3.6, 3.7 Unit 6: 1.3, 1.4, 1.5, 1.6 Unit 7: 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8
d) count forward by tens to determine the total number of objects to 100.	Unit 7: 1.1, 1.2, 1.3, 1.4, 3.8 Unit 8: 1.5, 1.6, 1.7, 2.2, 2.3, 2.4, 2.6, 2.7, 2.8, 2.10, 3.1, 3.2, 3.3, 3.4, 3.5
K.4 The student will	
a) recognize and describe with fluency part-whole relationships for numbers up to 5; and	Unit 6: 2.3, 2.4, 2.7, 3.1 Unit 8: 1.1, 1.3, 1.4, 1.5, 1.6, 1.7,
b) investigate and describe part-whole relationships for numbers up to 10.	Unit 6: 2.3, 2.4, 2.6, 3.1, 3.2, 3.3, 3.4 Unit 8: 1.1, 1.3, 1.4, 1.5, 1.6, 1.7, 2.1, 2.2, 2.3, 2.4
K.5 The student will investigate fractions by representing and solving practical problems involving equal sharing with two sharers.	This standard is covered in Investigations 3 in Number, Data, and Space ©2017 Grade 1 . Please see: Unit 4: 2.1, 2.2, 2.3, 2.4, 2.5, 2.6
Computation and Estimation	
K.6 The student will model and solve single-step story and picture problems with sums to 10 and differences within 10, using concrete objects.	Unit 4: 1.6, 1.9, 1.10, 2.2, 2.4, 2.7, 3.1, 3.2 Unit 6: 1.2, 1.3, 1.5, 2.1, 2.3, 2.8, 3.2, 3.4, 3.6 Unit 7: 1.2, 1.3, 2.2, 2.3, 3.2, 3.3, 3.4, 3.5 Unit 8: 1.1, 1.3, 1.6, 1.7, 2.2, 2.4, 2.6, 2.10, 3.1, 3.3, 3.4, 3.5
Measurement and Geometry	
K.7 The student will recognize the attributes of a penny, nickel, dime, and quarter and identify the number of pennies equivalent to a nickel, a dime, and a quarter.	For related content, please see: Unit 2: 1.7, 1.8 Unit 4: 1.6, 1.7, 1.8, 2.1, 2.4, 2.6, 3.2 Unit 6: 1.3, 1.4, 1.6, 3.2 Unit 8: 1.7, 2.5, 2.8

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K.8 The student will investigate the passage of time by reading and interpreting a calendar.	Unit 1: 1.3, 1.4, 1.5, 2.1, 2.2, 2.5, 3.2, 3.4 Unit 2: 1.1, 1.4, 1.7, 1.10, 2.3, 2.6, 2.9 Unit 3: 2.1
K.9 The student will compare two objects or events, using direct comparisons, according to one or more of the following attributes: length (longer, shorter), height (taller, shorter), weight (heavier, lighter), temperature (hotter, colder), volume (more, less), and time (longer, shorter).	Unit 2: 2.1, 2.2, 2.3, 2.4, 2.6, 2.7, 2.8, 2.9, 2.10, 2.11, 2.12 Unit 4: 1.1, 1.2, 1.4 Unit 6: 1.1, 1.2, 1.3 Unit 8: 2.3, 2.4, 2.6, 3.1, 3.2, 3.3, 3.5
K.10 The student will	
a) identify and describe plane figures (circle, triangle, square, and rectangle);	Unit 3: 1.1, 1.4, 1.5, 2.1, 2.2, 2.4, 2.6, 2.7 Unit 5: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 1.10
b) compare the size (smaller, larger) and shape of plane figures (circle, triangle, square, and rectangle); and	Unit 1: 1.1, 1.2, 1.3, 1.4, 1.5, 2.1, 2.2, 2.3, 2.4, 2.5 Unit 5: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 1.10
c) describe the location of one object relative to another (above, below, next to) and identify representations of plane figures (circle, triangle, square, and rectangle) regardless of their positions and orientations in space.	Unit 1: 1.1, 1.2, 1.3, 1.4, 1.5, 2.1, 2.2, 2.3, 2.4, 2.5 Unit 5: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 1.10
Probability and Statistics	
K.11 The student will	
a) collect, organize, and represent data; and	Unit 1: 1.5 Unit 2: 1.3, 1.6, 1.9, 2.1, 2.4, 2.5, 2.8, 2.12 Unit 3: 1.2, 1.3, 1.5, 2.3 Unit 4: 1.1, 1.4, 1.7, 1.10, 2.6, 3.2, 3.6 Unit 5: 1.1, 1.2, 1.3, 1.7 Unit 6: 1.1, 1.5, 1.6, 2.1, 2.6, 3.2 Unit 7: 1.1, 1.3, 1.4, 2.1, 2.2, 2.3, 3.3, 3.5, 3.6, 3.8 Unit 8: 1.6, 3.2
b) read and interpret data in object graphs, picture graphs, and tables.	Unit 1: 1.5 Unit 7: 1.1, 1.2, 1.4, 2.1, 2.2, 3.3

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<p>Patterns, Functions, and Algebra</p>	
<p>K.12 The student will sort and classify objects according to one attribute.</p>	<p>Unit 1: 3.3, 3.4, 3.5, 3.6 Unit 3: 1.2, 2.3 Unit 4: 2.3, 2.6, 3.6 Unit 5: 1.3 Unit 6: 1.5 Unit 7: 1.1, 1.2, 1.3, 1.4, 2.2, 3.3</p>
<p>K.13 The student will identify, describe, extend, create, and transfer repeating patterns.</p>	<p>For related content, please see: Unit 7: 3.3, 3.7</p>

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Grade 1 Units

Unit 1 - Building Numbers and Solving Story Problems

Unit 2 - Comparing and Combining Shapes

Unit 3 - How Many of Each? How Many in All

Unit 4 - Fish Lengths and Fraction Rugs

Unit 5 - Number Games and Crayon Problems

Unit 6 - Would You Rather Be an Eagle or a Whale?

Unit 7 - How Many Tens? How Many Ones?

Unit 8 - Blocks and Buildings

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<p align="center">Mathematics Standards of Learning for Virginia Public Schools Grade 1</p>	<p align="center">Investigations 3 in Number, Data, and Space ©2017 Grade 1</p>
<p>Mathematical Process Goals for Students</p>	
<p>Mathematical Problem Solving Students will apply mathematical concepts and skills and the relationships among them to solve problem situations of varying complexities. Students also will recognize and create problems from real-world data and situations within and outside mathematics and then apply appropriate strategies to determine acceptable solutions. To accomplish this goal, students will need to develop a repertoire of skills and strategies for solving a variety of problem types. A major goal of the mathematics program is to help students apply mathematics concepts and skills to become mathematical problem solvers.</p>	<p>Unit 1: 1.1, 1.2, 2.3, 2.8, 3.1, 3.2 Unit 3: 1.1, 1.2, 2.1, 2.2, 2.4, 2.5, 2.6, 2.7, 3.1, 3.2, 3.5 Unit 6: 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 2.1, 2.2</p>
<p>Mathematical Communication Students will communicate thinking and reasoning using the language of mathematics, including specialized vocabulary and symbolic notation, to express mathematical ideas with precision. Representing, discussing, justifying, conjecturing, reading, writing, presenting, and listening to mathematics will help students to clarify their thinking and deepen their understanding of the mathematics being studied. Mathematical communication becomes visible where learning involves participation in mathematical discussions.</p>	<p>Unit 2: 1.4, 1.5, 1.6, 1.7, 2.1, 2.2, 2.3, 2.4 Unit 5: 1.1, 1.4, 2.1, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 3.1, 3.5</p>
<p>Mathematical Reasoning Students will recognize reasoning and proof as fundamental aspects of mathematics. Students will learn and apply inductive and deductive reasoning skills to make, test, and evaluate mathematical statements and to justify steps in mathematical procedures. Students will use logical reasoning to analyze an argument and to determine whether conclusions are valid. In addition, students will use number sense to apply proportional and spatial reasoning and to reason from a variety of representations.</p>	<p>Unit 3: 1.1, 1.2, 2.1, 2.2, 2.4, 2.5, 2.6, 2.7, 3.1, 3.2, 3.5 Unit 7: 1.1, 1.3, 1.6, 1.7, 1.8, 2.1, 2.2, 2.3, 2.4, 2.5, 2.7, 2.8, 3.1, 3.2, 3.6</p>

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<p align="center">Mathematics Standards of Learning for Virginia Public Schools Grade 1</p>	<p align="center">Investigations 3 in Number, Data, and Space ©2017 Grade 1</p>
<p>Mathematical Connections Students will build upon prior knowledge to relate concepts and procedures from different topics within mathematics and see mathematics as an integrated field of study. Through the practical application of content and process skills, students will make connections among different areas of mathematics and between mathematics and other disciplines, and to real-world contexts. Science and mathematics teachers and curriculum writers are encouraged to develop mathematics and science curricula that support, apply, and reinforce each other.</p>	<p>Unit 7: 1.1, 1.2, 1.3, 1.5, 2.4, 3.1, 3.3, 3.5, 3.8 Unit 8: 1.1, 1.3, 1.4, 1.6, 1.7, 1.8, 1.9</p>
<p>Mathematical Representations Students will represent and describe mathematical ideas, generalizations, and relationships using a variety of methods. Students will understand that representations of mathematical ideas are an essential part of learning, doing, and communicating mathematics. Students should make connections among different representations – physical, visual, symbolic, verbal, and contextual – and recognize that representation is both a process and a product.</p>	<p>Unit 1: 1.2, 1.4, 2.2, 2.4, 2.5, 2.6, 2.7, 3.1, 3.2, 3.3, 3.4, 3.5 Unit 4: 1.1, 1.2, 1.3, 1.5, 1.6, 2.1, 2.2, 2.3, 2.4 Unit 6: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 2.1, 2.2 Unit 7: 1.2, 1.4, 2.2, 2.3, 2.5, 2.6, 2.7, 3.1, 3.3, 3.4, 3.5, 3.6, 3.7</p>
<p>Number and Number Sense</p>	
<p>1.1 The student will</p>	
<p>a) count forward orally by ones to 110, starting at any number between 0 and 110;</p>	<p>Unit 1: 1.1, 1.2, 1.3, 1.4, 1.5, 3.6 Unit 2: 2.3 Unit 3: 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8 Unit 7: 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8</p>
<p>b) write the numerals 0 to 110 in sequence and out-of-sequence;</p>	<p>Unit 1: 1.1, 1.2, 1.3, 1.4, 1.5, 2.3, 3.6 Unit 3: 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8 Unit 7: 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8</p>

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c) count backward orally by ones when given any number between 1 and 30; and	Unit 1: 3.1
d) count forward orally by ones, twos, fives, and tens to determine the total number of objects to 110.	Unit 1: 1.1, 1.2, 1.3, 1.4, 1.5, 3.6 Unit 2: 2.3 Unit 3: 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8 Unit 7: 1.3, 1.4, 1.5, 1.6, 1.7, 1.8. 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8
1.2 The student, given up to 110 objects, will	
a) group a collection into tens and ones and write the corresponding numeral;	Unit 1: 1.3, 1.4, 1.5, 2.1, 2.6, 3.6 Unit 2: 1.3, 1.6, 2.5 Unit 3: 1.1, 1.2, 1.4, 2.2, 2.4, 2.8, 3.5, 4.1, 4.2, 4.4, 4.6 Unit 4: 1.2, 1.4, 1.6, 2.3 Unit 5: 1.4, 1.6, 2.1, 2.2, 2.3, 2.6, 3.3, 3.5 Unit 6: 1.1, 1.2, 1.4, 1.6, 1.7, 1.9 Unit 7: 1.3, 1.4, 1.6, 1.8, 2.1, 2.4, 2.5, 2.7
b) compare two numbers between 0 and 110 represented pictorially or with concrete objects, using the words greater than, less than or equal to; and	Unit 1: 2.5, 3.6 Unit 7: 1.6, 2.2, 2.4, 2.5, 2.6, 2.7, 2.8
c) order three or fewer sets from least to greatest and greatest to least.	Unit 1: 2.5, 3.6, 3.7 Unit 2: 1.1, 1.2, 1.5, 1.7, 2.2 Unit 3: 1.2, 1.3, 2.1, 2.2, 2.4, 2.6, 3.4, 3.5, 4.1, 4.4, 4.5, 4.7, 4.8 Unit 4: 1.2, 1.4, 1.6 Unit 7: 1.6, 2.2, 2.4, 2.5, 2.6, 2.7, 2.8
1.3 The student, given an ordered set of ten objects and/or pictures, will indicate the ordinal position of each object, first through tenth.	This standard is outside the scope of Investigations 3 in Number, Data, and Space.

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Mathematics Standards of Learning for Virginia Public Schools Grade 1	Investigations 3 in Number, Data, and Space ©2017 Grade 1
1.4 The student will	
a) represent and solve practical problems involving equal sharing with two or four sharers; and	Unit 4: 2.1, 2.2, 2.3, 2.4, 2.5, 2.6
b) represent and name fractions for halves and fourths, using models.	Unit 4: 2.1, 2.2, 2.3, 2.4, 2.5, 2.6
1.5 The student, given a familiar problem situation involving magnitude, will	
a) select a reasonable order of magnitude from three given quantities: a one-digit numeral, a two-digit numeral, and a three-digit numeral (e.g., 5, 50, 500); and	For related content, please see: Unit 1: 2.5, 3.6, 3.7 Unit 2: 1.1, 1.2, 1.5, 1.7, 2.2 Unit 3: 1.2, 1.3, 2.1, 2.2, 2.4, 2.6, 3.4, 3.5, 4.1, 4.4, 4.5, 4.7, 4.8 Unit 4: 1.2, 1.4, 1.6 Unit 7: 1.6, 2.2, 2.4, 2.5, 2.6, 2.7, 2.8
b) explain the reasonableness of the choice.	For related content, please see: Unit 1: 2.5, 3.6, 3.7 Unit 2: 1.1, 1.2, 1.5, 1.7, 2.2 Unit 3: 1.2, 1.3, 2.1, 2.2, 2.4, 2.6, 3.4, 3.5, 4.1, 4.4, 4.5, 4.7, 4.8 Unit 4: 1.2, 1.4, 1.6 Unit 7: 1.6, 2.2, 2.4, 2.5, 2.6, 2.7, 2.8
Computation and Estimation	
1.6 The student will create and solve single-step story and picture problems using addition and subtraction within 20.	Unit 1: 2.3, 2.4, 2.6, 2.7, 2.8, 3.1, 3.2, 3.4, 3.5, 3.6, 3.7 Unit 2: 1.3 Unit 3: 2.1, 2.4, 2.6, 2.7, 2.8, 3.1, 3.2, 3.6 Unit 4: 1.5, 1.6, 1.7, 1.8, 2.6 Unit 5: 1.1, 1.5, 1.6, 1.7, 1.8, 2.3, 2.4, 2.6, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7 Unit 6: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 2.1, 2.2, 2.3 Unit 7: 1.1, 1.2

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Mathematics Standards of Learning for Virginia Public Schools Grade 1	Investigations 3 in Number, Data, and Space ©2017 Grade 1
1.7 The student will	
a) recognize and describe with fluency part-whole relationships for numbers up to 10; and	Unit 1: 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7 Unit 5: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8
b) demonstrate fluency with addition and subtraction within 10.	Unit 1: 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7 Unit 3: Unit 5: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8
Measurement and Geometry	
1.8 The student will determine the value of a collection of like coins (pennies, nickels, or dimes) whose total value is 100 cents or less.	Unit 1: 1.2, 1.3, 1.5, 2.1, 2.6, 3.5, 3.6 Unit 5: 3.2, 3.3, 3.4, 3.5, 3.6, 3.7 Unit 6: 1.3, 1.5, 2.2, 2.3 Unit 7: 1.1, 1.2, 1.3, 3.4
1.9 The student will investigate the passage of time and	
a) tell time to the hour and half-hour, using analog and digital clocks; and	Unit 1: 1.4, 2.3 Unit 2: 1.4 Unit 3: 1.4, 2.7, 4.3 Unit 4: 1.1, 1.2, 1.3, 1.5, 1.7, 2.1, 2.5, 2.6 Unit 5: 1.1, 1.2, 1.7, 2.4, 2.5, 2.8, 3.2 Unit 6: 1.6, 1.8, 2.1 Unit 7: 2.1, 2.3, 3.3, 3.7 Unit 8: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6
b) read and interpret a calendar.	Unit 4: 1.2
1.10 The student will use nonstandard units to measure and compare length, weight, and volume.	Unit 4: 1.3, 1.4, 1.5, 1.6, 1.7

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Mathematics Standards of Learning for Virginia Public Schools Grade 1	Investigations 3 in Number, Data, and Space ©2017 Grade 1
1.11 The student will	
a) identify, trace, describe, and sort plane figures (triangles, squares, rectangles, and circles) according to number of sides, vertices, and angles; and	Unit 1: 1.1, 1.2, 1.3, 1.4, 1.5 Unit 2: 1.1, 1.2, 1.3, 1.4, 1.6, 1.7, 2.1, 2.2, 2.3, 2.4, 2.5 Unit 4: 1.8, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6 Unit 8: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9
b) identify and describe representations of circles, squares, rectangles, and triangles in different environments, regardless of orientation, and explain reasoning.	Unit 7: 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 2.5, 2.6, 2.7, 2.8, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8
Probability and Statistics	
1.12 The student will	
a) collect, organize, and represent various forms of data using tables, picture graphs, and object graphs; and	Unit 1: 1.5 Unit 2: 2.1, 2.2, 2.3, 2.4 Unit 3: 4.1 Unit 6: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 2.1, 2.2, 2.3
b) read and interpret data displayed in tables, picture graphs, and object graphs, using the vocabulary more, less, fewer, greater than, less than, and equal to.	Unit 2: 2.1, 2.2, 2.3, 2.4 Unit 6: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 2.1, 2.2, 2.3
Patterns, Functions, and Algebra	
1.13 The student will sort and classify concrete objects according to one or two attributes.	Unit 2: 1.1, 1.6, 2.1, 2.2, 2.3, 2.5
1.14 The student will identify, describe, extend, create, and transfer growing and repeating patterns.	Unit 3: 4.3, 4.4, 4.5, 4.7, 4.8
1.15 The student will demonstrate an understanding of equality through the use of the equal symbol.	Unit 1: 2.2, 2.4, 2.5, 2.6, 3.2, 3.4 Unit 3: 1.2, 2.5, 2.6, 2.7, 2.8, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 4.8 Unit 5: 2.1, 2.3, 2.5, 2.7, 2.8, 3.1, 3.6

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Grade 2 Units

Unit 1 - Coins, Number Strings, and Story Problems

Unit 2 - Attributes of Shapes and Parts of A Whole

Unit 3 - How Many Stickers? How Many Cents?

Unit 4 - Pockets, Teeth and Guess My Rule

Unit 5 - How Many Tens? How Many Hundreds?

Unit 6 - How Far Can You Jump?

Unit 7 - Partners, Teams, and Other Groups

Unit 8 - Enough for the Class? Enough for the Grade?

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<p align="center">Mathematics Standards of Learning for Virginia Public Schools Grade 2</p>	<p align="center">Investigations 3 in Number, Data, and Space ©2017 Grade 2</p>
<p>Mathematical Process Goals for Students</p>	
<p>Mathematical Problem Solving Students will apply mathematical concepts and skills and the relationships among them to solve problem situations of varying complexities. Students also will recognize and create problems from real-world data and situations within and outside mathematics and then apply appropriate strategies to determine acceptable solutions. To accomplish this goal, students will need to develop a repertoire of skills and strategies for solving a variety of problem types. A major goal of the mathematics program is to help students apply mathematics concepts and skills to become mathematical problem solvers.</p>	<p>Unit 1: 1.1, 1.2, 1.4, 2.1, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 4.1, 4.2 Unit 8: 1.1, 1.3, 1.5, 1.6, 1.7, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8</p>
<p>Mathematical Communication Students will communicate thinking and reasoning using the language of mathematics, including specialized vocabulary and symbolic notation, to express mathematical ideas with precision. Representing, discussing, justifying, conjecturing, reading, writing, presenting, and listening to mathematics will help students to clarify their thinking and deepen their understanding of the mathematics being studied. Mathematical communication becomes visible where learning involves participation in mathematical discussions.</p>	<p>Unit 2: 1.1, 1.2, 1.3, 2.2, 3.1, 3.2, 3.4, 3.5 Unit 7: 1.2, 1.3, 1.4, 2.1, 2.3, 2.6</p>
<p>Mathematical Reasoning Students will recognize reasoning and proof as fundamental aspects of mathematics. Students will learn and apply inductive and deductive reasoning skills to make, test, and evaluate mathematical statements and to justify steps in mathematical procedures. Students will use logical reasoning to analyze an argument and to determine whether conclusions are valid. In addition, students will use number sense to apply proportional and spatial reasoning and to reason from a variety of representations.</p>	<p>Unit 3: 1.2, 1.5, 1.6, 1.7, 1.8, 2.3, 2.4, 2.6, 2.7, 2.8, 3.1, 3.2, 3.3, 3.4, 3.7 Unit 7: 1.1, 1.2, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6</p>

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Mathematics Standards of Learning for Virginia Public Schools Grade 2	Investigations 3 in Number, Data, and Space ©2017 Grade 2
<p>Mathematical Connections Students will build upon prior knowledge to relate concepts and procedures from different topics within mathematics and see mathematics as an integrated field of study. Through the practical application of content and process skills, students will make connections among different areas of mathematics and between mathematics and other disciplines, and to real-world contexts. Science and mathematics teachers and curriculum writers are encouraged to develop mathematics and science curricula that support, apply, and reinforce each other.</p>	<p>Unit 6: 1.2, 1.4, 1.5, 1.6, 2.1, 2.3, 2.4, 2.6 Unit 8: 1.4, 1.8, 1.9, 2.3, 2.5, 2.9</p>
<p>Mathematical Representations Students will represent and describe mathematical ideas, generalizations, and relationships using a variety of methods. Students will understand that representations of mathematical ideas are an essential part of learning, doing, and communicating mathematics. Students should make connections among different representations – physical, visual, symbolic, verbal, and contextual – and recognize that representation is both a process and a product.</p>	<p>Unit 1: 1.3, 1.4, 1.5, 2.1, 2.2, 2.3, 2.4, 2.6, 2.7, 2.8, 3.2, 3.5, 4.2 Unit 4: 1.1, 1.4, 1.5, 1.6, 2.3, 2.4, 2.5, 2.6 Unit 5: 1.3, 1.5, 1.6, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7 Unit 8: 1.2, 1.3, 1.5, 1.6, 1.7, 1.8, 1.9, 1.10, 1.11, 2.4, 2.5, 2.7, 2.8</p>
Number and Number Sense	
2.1 The student will	
a) read, write, and identify the place and value of each digit in a three-digit numeral, with and without models;	<p>Unit 5: 2.3, 2.4, 2.5, 2.6, 3.2, 3.6, 3.7 Unit 6: 1.1, 1.2, 1.4, 1.5, 2.2 Unit 7: 1.1, 2.1 Unit 8: 1.11, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9</p>
b) identify the number that is 10 more, 10 less, 100 more, and 100 less than a given number up to 999;	<p>Unit 3: 3.5, 3.6 Unit 5: 1.6, 2.3, 2.4, 2.5, 2.6, 3.3, 3.5, 3.6, 3.7</p>
c) compare and order whole numbers between 0 and 999; and	<p>Unit 3: 3.3, 3.5 Unit 5: 1.3, 1.4, 1.5, 1.6, 2.2, 2.3, 2.4, 2.5, 2.6, 3.5, 3.8 Unit 6: 1.1, 1.4 Unit 7: 1.1, 2.1 Unit 8: 2.1</p>

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Mathematics Standards of Learning for Virginia Public Schools Grade 2	Investigations 3 in Number, Data, and Space ©2017 Grade 2
d) round two-digit numbers to the nearest ten.	For related content, please see: Unit 5: 1.3, 1.4, 1.5, 1.6, 3.5, 3.8 Unit 8: 1.10, 1.11, 2.8
2.2 The student will	
a) count forward by twos, fives, and tens to 120, starting at various multiples of 2, 5, or 10;	Unit 1: 1.2, 1.3, 1.4, 1.5, 1.6, 2.4, 3.1, 3.3, 3.4, 3.5, 3.6 Unit 5: 2.2, 2.6, 3.3, 3.5, 3.6, 3.7, 3.8 Unit 7: 1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 2.4
b) count backward by tens from 120; and	Unit 3: 3.6 Unit 5: 3.7
c) use objects to determine whether a number is even or odd.	Unit 7: 1.1, 1.2, 1.3, 1.4
2.3 The student will	
a) count and identify the ordinal positions first through twentieth, using an ordered set of objects; and	This standard is outside the scope of Investigations 3 in Number, Data, and Space.
b) write the ordinal numbers 1st through 20th.	This standard is outside the scope of Investigations 3 in Number, Data, and Space.
2.4 The student will	
a) name and write fractions represented by a set, region, or length model for halves, fourths, eighths, thirds, and sixths;	Unit 2: 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8
b) represent fractional parts with models and with symbols; and	Unit 2: 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8
c) compare the unit fractions for halves, fourths, eighths, thirds, and sixths, with models.	Unit 2: 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8

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Mathematics Standards of Learning for Virginia Public Schools Grade 2	Investigations 3 in Number, Data, and Space ©2017 Grade 2
Computation and Estimation	
2.5 The student will	
a) recognize and use the relationships between addition and subtraction to solve single-step practical problems, with whole numbers to 20; and	Unit 1: 2.6, 3.2, 3.4, 4.2 Unit 3: 1.1, 1.5, 2.8, 3.7 Unit 5: 1.6 Unit 8: 1.6, 1.7, 1.8, 1.9
b) demonstrate fluency with addition and subtraction within 20.	Unit 1: 1.1, 1.3, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 3.2, 3.3, 3.4, 3.6, 3.7 Unit 2: 2.3, 2.4 Unit 3: 1.4, 1.6, 1.7, 1.8, 2.1, 2.2, 2.6, 2.7, 2.8, 3.3, 3.5, 3.6 Unit 4: 1.4, 1.5, 1.6, 2.2 Unit 5: 1.1, 1.3, 1.5, 1.6, 2.1, 3.3 Unit 7: 2.1, 2.5, 2.6 Unit 8: 1.2, 1.3, 1.9, 1.11, 2.8
2.6 The student will	
a) estimate sums and differences;	Unit 5: 1.3, 1.4, 1.5, 1.6, 3.5, 3.8 Unit 8: 1.4, 1.5, 1.6, 1.9, 1.10, 1.11, 2.2, 2.4, 2.8
b) determine sums and differences, using various methods; and	Unit 1: 2.4, 2.7, 3.6 Unit 2: 3.4 Unit 3: 1.4, 1.5, 1.7, 2.3, 2.5, 2.7, 2.8, 3.1, 3.2, 3.4, 3.6, 3.7 Unit 4: 1.1, 2.5 Unit 5: 1.1, 1.2, 1.5, 2.1, 2.4, 2.5, 3.1, 3.4, 3.5, 3.6, 3.7, 3.8 Unit 6: 1.1, 1.2, 1.4, 1.5, 1.6, 2.1, 2.5, 2.6 Unit 7: 1.1, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6 Unit 8: 1.1, 1.2, 1.4, 1.6, 1.7, 1.9, 1.11, 2.6

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c) create and solve single-step and two-step practical problems involving addition and subtraction.	Unit 1: 2.3, 2.4, 3.1, 3.3, 3.4, 3.6, 3.7, 4.1, 4.2, 4.3, 4.4, 4.5 Unit 3: 1.2, 1.3, 1.5, 1.6, 1.7, 1.8, 2.3, 2.4, 2.6, 2.7, 2.8, 2.9, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7 Unit 4: 1.4, 1.5, 1.6, 2.2 Unit 5: 1.3, 1.5, 1.6, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8 Unit 6: 1.2, 1.3, 1.5, 1.6, 2.1, 2.2, 2.4, 2.5, 2.6 Unit 8: 1.1, 1.2, 1.3, 1.6, 1.7, 1.8, 1.9, 1.10, 1.11
Measurement and Geometry	
2.7 The student will	
a) count and compare a collection of pennies, nickels, dimes, and quarters whose total value is \$2.00 or less; and	Unit 1: 1.5, 1.6, 3.3, 3.4, 3.6, 3.7 Unit 3: 2.7, 2.8 Unit 5: 1.4, 1.5, 1.6, 2.2 Unit 8: 1.4, 1.5
b) use the cent symbol, dollar symbol, and decimal point to write a value of money.	Unit 1: 1.3, 1.4, 1.5, 2.3, 2.4, 3.3, 3.4, 3.5, 3.6, 3.7 Unit 3: 1.3, 1.4, 1.5, 2.5, 2.7, 2.8, 3.1, 3.2 Unit 5: 1.4, 1.5, 1.6, 2.2 Unit 8: 1.4, 1.5, 1.6, 1.7, 1.9, 1.10, 1.11, 2.6, 2.9
2.8 The student will estimate and measure	
a) length to the nearest inch; and	Unit 6: 2.1, 2.2, 2.3, 2.4, 2.6
b) weight to the nearest pound.	For related content, please see: Unit 6: 2.1, 2.2, 2.3, 2.4, 2.6
2.9 The student will tell time and write time to the nearest five minutes, using analog and digital clocks.	Unit 1: 1.6, 2.1, 2.5, 2.7, 3.1, 4.1, 4.3, 4.4 Unit 2: 1.3, 2.2, 3.7, 3.8 Unit 3: 2.4, 2.9, 3.4, 3.6 Unit 4: 1.3, 1.6, 2.3 Unit 5: 1.1, 1.6, 3.1 Unit 6: 1.1, 1.3, 2.5 Unit 7: 1.2, 1.4, 2.3, 2.4, 2.6 Unit 8: 1.1, 1.4, 1.7, 1.8

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Mathematics Standards of Learning for Virginia Public Schools Grade 2	Investigations 3 in Number, Data, and Space ©2017 Grade 2
2.10 The student will	
a) determine past and future days of the week; and	The opportunity to address this standard is available. Please see Investigations 3 in Number, Data, and Space Kindergarten and Grade 1. Please see: Kindergarten: Unit 2: 1.1, 1.4, 1.7, 1.10, 2.3, 2.6, 2.9, 2.11 Unit 3: 1.3, 2.1, 2.5 Unit 4: 1.3, 1.6, 1.8, 2.2, 2.5, 2.7, 3.4 Unit 5: 1.6, 1.10 Unit 8: 2.1, 2.7, 3.1 Grade 1: Unit 4: 1.2
b) identify specific days and dates on a given calendar.	The opportunity to address this standard is available. Please see Investigations 3 in Number, Data, and Space Kindergarten and Grade 1. Please see: Kindergarten: Unit 2: 1.1, 1.4, 1.7, 1.10, 2.3, 2.6, 2.9, 2.11 Unit 3: 1.3, 2.1, 2.5 Unit 4: 1.3, 1.6, 1.8, 2.2, 2.5, 2.7, 3.4 Unit 5: 1.6, 1.10 Unit 8: 2.1, 2.7, 3.1 Grade 1: Unit 4: 1.2
2.11 The student will read temperature to the nearest 10 degrees.	This standard is addressed in Investigations 3 in Number, Data, and Space Grade 5. For related content, please see: Grade 5: Unit 5: 1.1, 1.2
2.12 The student will	
a) draw a line of symmetry in a figure; and	For related content, please see: Unit 2: 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.8
b) identify and create figures with at least one line of symmetry.	For related content, please see: Unit 2: 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.8

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2.13 The student will identify, describe, compare, and contrast plane and solid figures (circles/spheres, squares/cubes, and rectangles/rectangular prisms).	Unit 1: 1.2, 1.3, 1.4, 1.5 Unit 2: 1.1, 1.2, 1.3, 1.4, 1.5, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 3.1
Probability and Statistics	
2.14 The student will use data from probability experiments to predict outcomes when the experiment is repeated.	Unit 4: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 2.1, 2.2, 2.4
2.15 The student will	
a) collect, organize, and represent data in pictographs and bar graphs; and	Unit 4: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 2.1, 2.2, 2.3, 2.4
b) read and interpret data represented in pictographs and bar graphs.	Unit 4: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 2.1, 2.2, 2.3, 2.4
Patterns, Functions, and Algebra	
2.16 The student will identify, describe, create, extend, and transfer patterns found in objects, pictures, and numbers.	Unit 1: 1.2, 1.4, 1.5, 1.6, 2.1, 3.3, 3.4, 3.5, 3.6, 3.7
2.17 The student will demonstrate an understanding of equality through the use of the equal symbol and the use of the not equal symbol.	Unit 1: 1.1, 1.2, 1.3, 1.6, 2.1, 2.2, 2.4, 2.6 Unit 3: 2.8, 3.1, 3.4, 3.6, 3.7 Unit 4: 2.6 Unit 7: 2.1, 2.2, 2.6 Unit 8: 1.2, 1.6, 1.10, 1.11, 2.2, 2.4, 2.8, 2.9

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Grade 3 Units

Unit 1 - Understanding Equal Groups

Unit 2 Graphs and Line Plots

Unit 3 - Travel Stories and Collections

Unit 4 - Perimeter, Area, and Polygons

Unit 5 - Cube Patterns, Arrays, and Multiples of 10

Unit 6 - Fair Shares and Fractions on Number Lines

Unit 7 - How Many Miles?

Unit 8 Larger Numbers and Multi-Step Problems

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Mathematics Standards of Learning for Virginia Public Schools Grade 3	Investigations 3 in Number, Data, and Space ©2017 Grade 3
Mathematical Process Goals for Students	
<p>Mathematical Problem Solving Students will apply mathematical concepts and skills and the relationships among them to solve problem situations of varying complexities. Students also will recognize and create problems from real-world data and situations within and outside mathematics and then apply appropriate strategies to determine acceptable solutions. To accomplish this goal, students will need to develop a repertoire of skills and strategies for solving a variety of problem types. A major goal of the mathematics program is to help students apply mathematics concepts and skills to become mathematical problem solvers.</p>	<p>Unit 1: 1.1, 1.3, 1.4, 2.3, 2.4, 2.5, 4.6 Unit 3: 1.2, 1.3, 1.4, 3.1, 4.2, 5.3, 5.5 Unit 5: 1.2, 2.1, 2.3, 3.4, 3.5 Unit 7: 1.4, 1.5, 1.6, 1.7, 3.1, 3.4, 3.5</p>
<p>Mathematical Communication Students will communicate thinking and reasoning using the language of mathematics, including specialized vocabulary and symbolic notation, to express mathematical ideas with precision. Representing, discussing, justifying, conjecturing, reading, writing, presenting, and listening to mathematics will help students to clarify their thinking and deepen their understanding of the mathematics being studied. Mathematical communication becomes visible where learning involves participation in mathematical discussions.</p>	<p>Unit 4: 2.2, 2.3, 2.5, 2.6, 2.7, 3.2, 3.3 Unit 7: 1.5, 1.6, 1.7, 2.1, 2.5, 3.3, 3.4</p>
<p>Mathematical Reasoning Students will recognize reasoning and proof as fundamental aspects of mathematics. Students will learn and apply inductive and deductive reasoning skills to make, test, and evaluate mathematical statements and to justify steps in mathematical procedures. Students will use logical reasoning to analyze an argument and to determine whether conclusions are valid. In addition, students will use number sense to apply proportional and spatial reasoning and to reason from a variety of representations.</p>	<p>Unit 2: 1.2, 1.3, 1.4, 3.1, 4.2, 5.3, 5.5 Unit 5: 1.2, 2.1, 2.3, 3.4, 3.5</p>

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<p align="center">Mathematics Standards of Learning for Virginia Public Schools Grade 3</p>	<p align="center">Investigations 3 in Number, Data, and Space ©2017 Grade 3</p>
<p>Mathematical Connections Students will build upon prior knowledge to relate concepts and procedures from different topics within mathematics and see mathematics as an integrated field of study. Through the practical application of content and process skills, students will make connections among different areas of mathematics and between mathematics and other disciplines, and to real-world contexts. Science and mathematics teachers and curriculum writers are encouraged to develop mathematics and science curricula that support, apply, and reinforce each other.</p>	<p>Unit 6: 1.3, 1.4, 1.5, 1.7, 1.8 Unit 8: 1.1, 1.3, 1.4, 1.5, 2.1, 2.2, 2.3, 2.5, 3.1, 3.2, 3.3, 3.4, 3.5</p>
<p>Mathematical Representations Students will represent and describe mathematical ideas, generalizations, and relationships using a variety of methods. Students will understand that representations of mathematical ideas are an essential part of learning, doing, and communicating mathematics. Students should make connections among different representations – physical, visual, symbolic, verbal, and contextual – and recognize that representation is both a process and a product.</p>	<p>Unit 1: 2.2, 3.2, 3.3, 3.4 Unit 2: 1.1, 1.5, 1.6, 1.9, 2.1, 2.2, 2.5 Unit 6: 1.1, 1.3, 1.4, 1.8, 2.2, 2.3, 2.4 Unit 8: 1.2, 3.1, 3.2, 3.3, 3.5</p>
<p>Number and Number Sense</p>	
<p>3.1 The student will</p>	
<p>a) read, write, and identify the place and value of each digit in a six-digit whole number, with and without models;</p>	<p>For related content, please see: Unit 3: 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4, 3.5, 4.1, 5.2</p>
<p>b) round whole numbers, 9,999 or less, to the nearest ten, hundred, and thousand; and</p>	<p>Unit 3: 1.1, 2.4, 3.2, 3.3, 3.4, 3.5 Unit 5: 1.3, 2.1</p>
<p>c) compare and order whole numbers, each 9,999 or less.</p>	<p>Unit 3: 5.1, 5.2, 5.6</p>

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3.2 The student will	
a) name and write fractions and mixed numbers represented by a model;	Unit 6: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 2.1, 2.2, 2.3, 2.4, 2.5
b) represent fractions and mixed numbers with models and symbols; and	Unit 6: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 2.1, 2.2, 2.3, 2.4, 2.5
c) compare fractions having like and unlike denominators, using words and symbols (>, <, =, or ≠), with models.	Unit 6: 1.2, 2.2, 2.3, 2.4, 2.5 Unit 7: 1.4, 2.4 Unit 8: 3.4
Computation and Estimation	
3.3 The student will	
estimate and determine the sum or difference of two whole numbers; and	Unit 3: 1.5, 3.3, 3.4, 3.5, 4.1, 4.2, 4.3, 4.4, 4.5, 5.3, 5.4, 5.5, 5.6 Unit 7: 1.4, 1.5, 1.6, 1.7, 2.1, 2.2, 2.3, 2.4, 2.5, 3.2, 3.3, 3.4, 3.6
create and solve single-step and multistep practical problems involving sums or differences of two whole numbers, each 9,999 or less.	Unit 3: 2.4, 3.1, 3.2, 3.4, 3.5, 4.3, 4.4, 5.6 Unit 5: 1.4, 2.3, 2.4, 2.6, 3.4, 3.5, 3.6 Unit 7: 1.1, 1.2, 1.3, 1.7, 2.1, 2.2, 2.5, 3.1, 3.3, 3.5, 3.6 Unit 8: 2.4, 2.5, 3.1, 3.4, 3.5
3.4 The student will	
represent multiplication and division through 10×10 , using a variety of approaches and models;	Unit 1: 2.2, 3.3, 3.4, 3.5, 3.6, 4.5, 4.6 Unit 2: 2.6 Unit 3: 2.2, 3.1, 3.2, 3.3, 3.4, 5.1 Unit 4: 2.3, 2.7 Unit 5: 1.1, 1.2, 1.4, 2.1, 2.2, 2.4, 3.1, 3.3, 3.5, 3.6 Unit 6: 1.2, 1.5, 2.1, 2.2, 2.3 Unit 8: 1.1, 1.3, 1.4, 1.6, 2.1, 2.2, 2.3, 2.4, 2.5, 3.5
create and solve single-step practical problems that involve multiplication and division through 10×10 ; and	Unit 1: 1.1, 1.2, 1.3, 1.4, 2.3, 2.4, 2.5, 2.6, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6 Unit 5: 1.4, 1.5, 2.5, 2.6, 3.1, 3.2, 3.3, 3.5, 3.6 Unit 8: 1.1, 1.3, 1.4, 1.5, 1.6, 2.1, 2.3, 2.4, 2.5

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Mathematics Standards of Learning for Virginia Public Schools Grade 3	Investigations 3 in Number, Data, and Space ©2017 Grade 3
demonstrate fluency with multiplication facts of 0, 1, 2, 5, and 10; and	Unit 1: 3.3, 3.4, 3.5, 3.6, 3.7, 4.5., 4.6 Unit 5: 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 3.1, 3.2, 3.4, 3.5, 3.6 Unit 8: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 2.1, 2.2, 2. 3, 2.4, 2.5
solve single-step practical problems involving multiplication of whole numbers, where one factor is 99 or less and the second factor is 5 or less.	Unit 1: 1.1, 1.2, 1.3, 1.4, 2.3, 2.4, 2.5, 2.6, 3.3, 3.4, 3.5, 3.6, 3.7, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6 Unit 5: 1.4, 1.5, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6 Unit 8: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 2.1, 2.2, 2.3, 2.4, 2.5
3.5 The student will solve practical problems that involve addition and subtraction with proper fractions having like denominators of 12 or less.	Unit 6: 1.3, 1.4, 1.8, 2.1
Measurement and Geometry	
3.6 The student will	
determine the value of a collection of bills and coins whose total value is \$5.00 or less;	For related content, please see: Unit 3: 1.3, 3.1 Unit 7: 1.5, 2.1, 3.3, 3.5, 3.6
compare the value of two sets of coins or two sets of coins and bills; and	For related content, please see: Unit 3: 1.3, 3.1 Unit 7: 1.5, 2.1, 3.3, 3.5, 3.6
make change from \$5.00 or less.	For related content, please see: Unit 3: 1.3, 3.1 Unit 7: 1.5, 2.1, 3.3, 3.5, 3.6
3.7 The student will estimate and use U.S. Customary and metric units to measure	
a) length to the nearest 1/2 inch, inch, foot, yard, centimeter, and meter; and	Unit 2: 2.2, 2.3, 2.4, 2.5, 2.6 Unit 4: 1.1 Unit 6: 1.6
b) liquid volume in cups, pints, quarts, gallons, and liters.	Unit 7: 1.1, 1.4, 1.5, 1.6, 1.7

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Mathematics Standards of Learning for Virginia Public Schools Grade 3	Investigations 3 in Number, Data, and Space ©2017 Grade 3
3.8 The student will estimate and	
a) measure the distance around a polygon in order to determine its perimeter using U.S. Customary and metric units; and	Unit 4: 1.1, 1.2, 1.3, 1.4, 1.5, 2.4, 3.4, 3.5
b) count the number of square units needed to cover a given surface in order to determine its area.	Unit 4: 2.2, 2.3, 2.4, 2.5, 2.6, 2.7
3.9 The student will	
tell time to the nearest minute, using analog and digital clocks;	Unit 3: 4.1, 4.2, 4.3, 4.4, 4.5, 5.1, 5.2, 5.3, 5.4, 5.5, 5.6 Unit 6: 1.6, 1.7, 1.8, 2.4, 2.5 Unit 8: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 3.4, 3.5
solve practical problems related to elapsed time in one-hour increments within a 12-hour period; and	Unit 3: 4.1, 4.2, 4.3, 4.4, 4.5, 5.1, 5.2, 5.3, 5.4, 5.5, 5.6 Unit 6: 2.4, 2.5 Unit 8: 1.4, 1.5, 1.6, 3.4, 3.5
identify equivalent periods of time and solve practical problems related to equivalent periods of time.	Unit 3: 4.1, 4.2, 4.3, 4.4, 4.5, 5.1, 5.2, 5.3, 5.4, 5.5, 5.6 Unit 6: 2.4, 2.5 Unit 8: 1.4, 1.5, 1.6, 3.4, 3.5
3.10 The student will read temperature to the nearest degree.	This standard is addressed in Investigations 3 in Number, Data, and Space Grade 5. For related content, please see: Grade 5: Unit 5: 1.1, 1.2
3.11 The student will identify and draw representations of points, lines, line segments, rays, and angles.	For related content, please see: Unit 4: 3.1, 3.2, 3.3, 3.4, 3.5
3.12 The student will	
define polygon;	Unit 4: 1.3, 3.1, 3.2, 3.3, 3.4

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Mathematics Standards of Learning for Virginia Public Schools Grade 3	Investigations 3 in Number, Data, and Space ©2017 Grade 3
identify and name polygons with 10 or fewer sides; and	Unit 4: 1.3, 3.1, 3.2, 3.3, 3.4
combine and subdivide polygons with three or four sides and name the resulting polygon(s).	Unit 4: 3.4, 3.5
3.13 The student will identify and describe congruent and noncongruent figures.	Unit 4: 2.1, 3.1
Probability and Statistics	
3.14 The student will investigate and describe the concept of probability as a measurement of chance and list possible outcomes for a single event.	For related content, please see: Unit 2: 1.1, 1.2, 1.3, 1.4, 1.7, 1.8, 1.9, 2.5, 2.6
3.15 The student will	
collect, organize, and represent data in pictographs or bar graphs; and	Unit 2: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 2.5, 2.6 Unit 3: 1.1 Unit 8: 3.2
read and interpret data represented in pictographs and bar graphs.	Unit 2: 1.1, 1.2, 1.3, 1.4, 1.5, 1.5, 1.6, 1.7, 1.8, 1.9, 2.5, 2.6 Unit 8: 3.2
Patterns, Functions, and Algebra	
3.16 The student will identify, describe, create, and extend patterns found in objects, pictures, numbers and tables.	Unit 1: 1.3, 2.1, 2.2, 2.5, 2.6, 3.5, 3.6, 3.7 Unit 3: 1.4, 2.1 Unit 5: 1.1, 1.2, 1.3, 3.2 Unit 8: 1.2, 3.1, 3.2, 3.3, 3.4, 3.5
3.17 The student will create equations to represent equivalent mathematical relationships.	Unit 3: 2.4, 3.1, 3.2, 3.4, 3.5, 4.3, 4.4, 5.6 Unit 5: 1.4, 2.3, 2.4, 2.6, 3.4, 3.5, 3.6 Unit 7: 1.1, 1.2, 1.3, 1.7, 2.1, 2.2, 2.5, 3.1, 3.3, 3.5, 3.6 Unit 8: 2.4, 2.5, 3.1, 3.4, 3.5

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Grade 4 Units

- Unit 1 - Arrays, Factors, and Multiplicative Comparison**
- Unit 2 - Generating and Representing Measurement Data**
- Unit 3 - Multiple Towers and Cluster Problems**
- Unit 4 - Measuring and Classifying Shapes**
- Unit 5 - Large Numbers and Landmarks**
- Unit 6 - Fraction Cards and Decimal Grids**
- Unit 7 - How Many Packages and Groups?**
- Unit 8 - Penny Jars and Towers**

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Mathematics Standards of Learning for Virginia Public Schools Grade 4	Investigations 3 in Number, Data, and Space ©2017 Grade 4
Mathematical Process Goals for Students	
<p>Mathematical Problem Solving Students will apply mathematical concepts and skills and the relationships among them to solve problem situations of varying complexities. Students also will recognize and create problems from real-world data and situations within and outside mathematics and then apply appropriate strategies to determine acceptable solutions. To accomplish this goal, students will need to develop a repertoire of skills and strategies for solving a variety of problem types. A major goal of the mathematics program is to help students apply mathematics concepts and skills to become mathematical problem solvers.</p>	<p>Unit 1: 1.1, 1.5, 1.6, 1.8, 2.1 Unit 3: 1.1, 1.4, 2.1, 2.2, 2.3, 3.3 Unit 7: 1.1, 1.2, 1.3, 1.4, 1.6, 1.7, 2.1, 2.2, 2.4, 2.5, 3.1, 3.3, 3.4, 3.5</p>
<p>Mathematical Communication Students will communicate thinking and reasoning using the language of mathematics, including specialized vocabulary and symbolic notation, to express mathematical ideas with precision. Representing, discussing, justifying, conjecturing, reading, writing, presenting, and listening to mathematics will help students to clarify their thinking and deepen their understanding of the mathematics being studied. Mathematical communication becomes visible where learning involves participation in mathematical discussions.</p>	<p>Unit 2: 1.2, 1.4, 1.5, 2.4, 2.5 Unit 6: 1.1, 1.2, 1.5, 1.6, 2.2, 1.4, 2.5, 2.6, 3.3, 3.6, 4.1, 4.3</p>
<p>Mathematical Reasoning Students will recognize reasoning and proof as fundamental aspects of mathematics. Students will learn and apply inductive and deductive reasoning skills to make, test, and evaluate mathematical statements and to justify steps in mathematical procedures. Students will use logical reasoning to analyze an argument and to determine whether conclusions are valid. In addition, students will use number sense to apply proportional and spatial reasoning and to reason from a variety of representations.</p>	<p>Unit 3: 1.1, 1.4, 2.1, 2.2, 2.3, 3.3 Unit 7: 1.2, 1.4, 1.5, 2.1, 2.4, 2.5, 3.1, 3.5</p>

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Mathematics Standards of Learning for Virginia Public Schools Grade 4	Investigations 3 in Number, Data, and Space ©2017 Grade 4
<p>Mathematical Connections Students will build upon prior knowledge to relate concepts and procedures from different topics within mathematics and see mathematics as an integrated field of study. Through the practical application of content and process skills, students will make connections among different areas of mathematics and between mathematics and other disciplines, and to real-world contexts. Science and mathematics teachers and curriculum writers are encouraged to develop mathematics and science curricula that support, apply, and reinforce each other.</p>	<p>Unit 4: 1.3, 1.4, 3.3, 3.4, 4.3, 4.5 Unit 5: 1.6, 2.1, 2.6, 2.7, 3.5, 3.6</p>
<p>Mathematical Representations Students will represent and describe mathematical ideas, generalizations, and relationships using a variety of methods. Students will understand that representations of mathematical ideas are an essential part of learning, doing, and communicating mathematics. Students should make connections among different representations – physical, visual, symbolic, verbal, and contextual – and recognize that representation is both a process and a product.</p>	<p>Unit 1: 1.2, 1.3, 1.6, 2.1, 2.2 Unit 2: 1.1, 1.5, 2.1, 2.4 Unit 8: 1.1, 1.2, 1.3, 1.5, 1.6, 1.7, 1.8, 1.9</p>
Number and Number Sense	
4.1 The student will	
a) read, write, and identify the place and value of each digit in a nine-digit whole number;	Unit 5: 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6
b) compare and order whole numbers expressed through millions; and	Unit 5: 3.1, 3.2 Unit 6: 2.2
c) round whole numbers expressed through millions to the nearest thousand, ten thousand, and hundred thousand.	Unit 5: 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6 Unit 7: 1.4, 1.5, 1.6, 2.2, 2.3, 3.4, 3.5, 3.6 Unit 8: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6

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Mathematics Standards of Learning for Virginia Public Schools Grade 4	Investigations 3 in Number, Data, and Space ©2017 Grade 4
4.2 The student will	
a) compare and order fractions and mixed numbers, with and without models;	Unit 6: 2.1, 2.2, 2.3, 2.4, 2.5, 2.6
b) represent equivalent fractions; and	Unit 6: 1.1, 1.2, 1.3, 1.5, 1.6, 2.2, 2.3, 2.4, 2.5, 2.6, 2.8
c) identify the division statement that represents a fraction, with models and in context.	Unit 6: 2.1, 2.2
4.3 The student will	
a) read, write, represent, and identify decimals expressed through thousandths;	Unit 6: 1.4, 1.5, 1.6, 2.7, 2.8, 3.5, 3.6
b) round decimals to the nearest whole number;	For related content, please see: Unit 6: 1.4, 1.5, 1.6, 2.7, 2.8, 3.5, 3.6
c) compare and order decimals; and	Unit 6: 2.7, 2.8
d) given a model, write the decimal and fraction equivalents.	Unit 6: 1.5, 1.6, 2.8
Computation and Estimation	
4.4 The student will	
a) demonstrate fluency with multiplication facts through 12 x 12, and the corresponding division facts;	Unit 1: 2.1, 2.2, 2.3, 2.4 Unit 3: 1.1, 2.5, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7
b) estimate and determine sums, differences, and products of whole numbers;	Unit 3: 1.1, 1.5, 3.1, 3.2, 3.3, 3.4, 3.5, 3.7 Unit 5: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 2.1, 2.4, 2.5, 2.6, 2.7, 3.4, 3.5, 3.6 Unit 7: 1.3, 1.4, 1.5, 1.6, 1.7, 2.1, 2.2, 2.3, 2.4, 2.5, 3.5
c) estimate and determine quotients of whole numbers, with and without remainders; and	Unit 3: 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 3.4, 3.7 Unit 4: 4.5, 4.6 Unit 7: 3.1, 3.2, 3.3, 3.4, 3.5, 3.6

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Mathematics Standards of Learning for Virginia Public Schools Grade 4	Investigations 3 in Number, Data, and Space ©2017 Grade 4
d) create and solve single-step and multistep practical problems involving addition, subtraction, and multiplication, and single-step practical problems involving division with whole numbers.	Unit 1: 1.4, 2.2 Unit 2: 2.4 Unit 3: 1.1, 2.1, 3.6 Unit 4: 1.4, 1.5, 3.2 Unit 5: 2.3, 2.6, 2.7, 3.3, 3.4, 3.5, 3.6 Unit 6: 1.4, 2.3, 2.7 Unit 7: 1.2, 1.3, 2.1, 3.4, 3.5, 3.6 Unit 8: 1.1, 1.3, 1.5, 1.6, 1.7, 1.8, 1.9, 1.10
4.5 The student will	
a) determine common multiples and factors, including least common multiple and greatest common factor;	Unit 1: 1.1, 1.2, 1.6, 1.7, 1.8, 2.1, 2.2, 2.3, 2.4
b) add and subtract fractions and mixed numbers having like and unlike denominators; and	Unit 6: 3.1, 3.3, 3.4, 3.5, 4.2, 4.3, 4.4
c) solve single-step practical problems involving addition and subtraction with fractions and mixed numbers.	Unit 6: 3.1, 3.2, 3.3, 3.4, 4.2, 4.3, 4.4
4.6 The student will	
a) add and subtract with decimals; and	Unit 6: 3.5, 3.6
b) solve single-step and multistep practical problems involving addition and subtraction with decimals.	Unit 6: 3.5, 3.6
Measurement and Geometry	
4.7 The student will solve practical problems that involve determining perimeter and area in U.S. Customary and metric units.	Unit 4: 1.3, 1.4, 1.5, 4.4, 4.5, 4.6
4.8 The student will	
a) estimate and measure length and describe the result in U.S. Customary and metric units;	Unit 4: 1.1, 1.2, 1.3, 1.4, 1.5
b) estimate and measure weight/mass and describe the result in U.S. Customary and metric units;	For related content, please see: Unit 4: 1.1, 1.2, 1.3, 1.4, 1.5

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c) given the equivalent measure of one unit, identify equivalent measures of length, weight/mass, and liquid volume between units within the U.S. Customary system; and	Unit 2: 1.2, 2.1, 2.2, 2.3 Unit 4: 1.1, 1.2, 1.3, 1.4, 1.5 Unit 7: 1.1, 1.2
d) solve practical problems that involve length, weight/mass, and liquid volume in U.S. Customary units.	Unit 2: 1.2, 1.3, 1.4, 1.5, 2.1, 2.2, 2.4, 2.5, 2.6 Unit 4: 1.3, 1.4, 1.5 Unit 5: 1.1, 1.2, 1.3, 2.1, 2.6, 2.7, 3.4, 3.5, 3.6 Unit 6: 3.5, 3.6, 4.2, 4.3, 4.4 Unit 7: 1.2, 3.6 Unit 8: 1.7
4.9 The student will solve practical problems related to elapsed time in hours and minutes within a 12-hour period.	This standard is addressed in Grade 3. For related content, please see Grade 3: Unit 3: 4.1, 4.2, 4.3, 4.4, 4.5, 5.1, 5.2, 5.3, 5.4, 5.5, 5.6 Unit 6: 2.4, 2.5 Unit 8: 1.4, 1.5, 1.6, 3.4, 3.5
4.10 The student will	
a) identify and describe points, lines, line segments, rays, and angles, including endpoints and vertices; and	Unit 4: 3.1, 3.2, 3.3, 3.4
b) identify and describe intersecting, parallel, and perpendicular lines.	Unit 4: 2.1, 2.2, 2.5, 3.2, 3.3, 4.3
4.11 The student will identify, describe, compare, and contrast plane and solid figures according to their characteristics (number of angles, vertices, edges, and the number and shape of faces) using concrete models and pictorial representations.	Unit 4: 2.1, 2.2, 2.3, 2.4, 2.5
4.12 The student will classify quadrilaterals as parallelograms, rectangles, squares, rhombi, and/or trapezoids.	Unit 4: 2.1, 2.2, 2.3, 2.4, 2.5

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Mathematics Standards of Learning for Virginia Public Schools Grade 4	Investigations 3 in Number, Data, and Space ©2017 Grade 4
Probability and Statistics	
4.13 The student will	
a) determine the likelihood of an outcome of a simple event;	This standard is addressed Investigations 3 in Number, Data, and Space in Grade 5. For related content, please: Grade 5: Unit 3: 3.4, 3.5, 3.6 Unit 4: 3.1, 3.2, 3.3, 3.4, 3.5
b) represent probability as a number between 0 and 1, inclusive; and	This standard is addressed Investigations 3 in Number, Data, and Space in Grade 5. For related content, please: Grade 5: Unit 3: 3.4, 3.5, 3.6 Unit 4: 3.1, 3.2, 3.3, 3.4, 3.5
c) create a model or practical problem to represent a given probability.	This standard is addressed Investigations 3 in Number, Data, and Space in Grade 5. For related content, please: Grade 5: Unit 3: 3.4, 3.5, 3.6 Unit 4: 3.1, 3.2, 3.3, 3.4, 3.5
4.14 The student will	
a) collect, organize, and represent data in bar graphs and line graphs;	Unit 2: 1.1, 1.2, 1.3, 1.4, 1.5, 2.2, 2.3, 2.5, 2.6
b) interpret data represented in bar graphs and line graphs; and	Unit 2: 1.1, 1.2, 1.3, 1.4, 1.5, 2.2, 2.3, 2.5, 2.6
c) compare two different representations of the same data (e.g., a set of data displayed on a chart and a bar graph, a chart and a line graph, or a pictograph and a bar graph).	For related content, please see: Unit 2: 1.1, 1.2, 1.3, 1.4, 1.5, 2.2, 2.3, 2.5, 2.6

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Mathematics Standards of Learning for Virginia Public Schools Grade 4	Investigations 3 in Number, Data, and Space ©2017 Grade 4
Patterns, Functions, and Algebra	
4.15 The student will identify, describe, create, and extend patterns found in objects, pictures, numbers, and tables.	Unit 8: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9 1.10
4.16 The student will recognize and demonstrate the meaning of equality in an equation.	Unit 1: 1.5, 1.6, 1.8, 2.3 Unit 2: 2.3 Unit 3: 2.5, 3.6 Unit 4: 2.2 Unit 7: 2.4, 2.5 Unit 8: 1.5, 1.8

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Grade 5 Units

Unit 1 - Puzzles, Clusters, and Towers

Unit 2 - Prisms and Solids

Unit 3 - Rectangles, Clocks, and Tracks

Unit 4 - How Many People and Teams?

Unit 5 - Temperature, Height, and Growth

Unit 6 - Between 0 and 1

Unit 7 - Races, Arrays, and Grids

Unit 8 - Properties of Polygons

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Mathematics Standards of Learning for Virginia Public Schools Grade 5	Investigations 3 in Number, Data, and Space ©2017 Grade 5
Mathematical Process Goals for Students	
<p>Mathematical Problem Solving Students will apply mathematical concepts and skills and the relationships among them to solve problem situations of varying complexities. Students also will recognize and create problems from real-world data and situations within and outside mathematics and then apply appropriate strategies to determine acceptable solutions. To accomplish this goal, students will need to develop a repertoire of skills and strategies for solving a variety of problem types. A major goal of the mathematics program is to help students apply mathematics concepts and skills to become mathematical problem solvers.</p>	<p>Unit 1: 1.1, 1.3, 2.2, 2.4, 2.5, 3.2, 3.5 Unit 4: 1.2, 2.1, 2.4, 2.5, 3.1, 3.3, 3.4 Unit 7: 1.1, 1.4, 1.7, 1.11, 2.1, 2.3, 3.2, 3.4, 3.5, 3.6, 3.8, 3.10</p>
<p>Mathematical Communication Students will communicate thinking and reasoning using the language of mathematics, including specialized vocabulary and symbolic notation, to express mathematical ideas with precision. Representing, discussing, justifying, conjecturing, reading, writing, presenting, and listening to mathematics will help students to clarify their thinking and deepen their understanding of the mathematics being studied. Mathematical communication becomes visible where learning involves participation in mathematical discussions.</p>	<p>Unit 3: 1.1, 1.2, 1.5, 2.1, 2.2, 2.3, 2.6, 3.2, 3.3, 3.4 Unit 8: 1.1, 1.3, 1.5, 2.1, 2.3, 2.4, 2.5</p>
<p>Mathematical Reasoning Students will recognize reasoning and proof as fundamental aspects of mathematics. Students will learn and apply inductive and deductive reasoning skills to make, test, and evaluate mathematical statements and to justify steps in mathematical procedures. Students will use logical reasoning to analyze an argument and to determine whether conclusions are valid. In addition, students will use number sense to apply proportional and spatial reasoning and to reason from a variety of representations.</p>	<p>Unit 4: 1.2, 2.1, 2.4, 2.5, 3.1, 3.3, 3.4 Unit 8: 2.1, 2.2, 2.4, 2.5</p>

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Mathematics Standards of Learning for Virginia Public Schools Grade 5	Investigations 3 in Number, Data, and Space ©2017 Grade 5
<p>Mathematical Connections Students will build upon prior knowledge to relate concepts and procedures from different topics within mathematics and see mathematics as an integrated field of study. Through the practical application of content and process skills, students will make connections among different areas of mathematics and between mathematics and other disciplines, and to real-world contexts. Science and mathematics teachers and curriculum writers are encouraged to develop mathematics and science curricula that support, apply, and reinforce each other.</p>	<p>Unit 3: 1.6, 2.1, 2.2, 3.3, 3.5, 3.6 Unit 4: 1.5, 2.1, 3.1, 3.2, 3.3, 3.4</p>
<p>Mathematical Representations Students will represent and describe mathematical ideas, generalizations, and relationships using a variety of methods. Students will understand that representations of mathematical ideas are an essential part of learning, doing, and communicating mathematics. Students should make connections among different representations – physical, visual, symbolic, verbal, and contextual – and recognize that representation is both a process and a product.</p>	<p>Unit 2: 1.1, 1.4, 1.6, 1.7, 1.8, 2.2 Unit 3: 1.1, 1.3, 1.4, 1.6, 2.1, 2.5, 2.7, 3.2, 3.3, 3.6 Unit 5: 1.1, 1.2, 1.3, 1.4, 1.7, 2.1, 2.3, 2.5 Unit 7: 1.3, 1.6, 1.8, 1.9, 1.10, 2.2, 2.3, 2.4, 3.3, 3.4, 3.8</p>
Number and Number Sense	
5.1 The student, given a decimal through thousandths, will round to the nearest whole number, tenth, or hundredth.	Unit 6: 1.6, 1.7, 1.8, 2.2
5.2 The student will	
a) represent and identify equivalencies among fractions and decimals, with and without models; and	<p>Unit 3: 1.1 Unit 6: 1.1, 1.2, 1.4, 2.2 Unit 7: 2.2, 2.3, 2.4, 3.1, 3.6 Unit 8: 2.2</p>
b) compare and order fractions, mixed numbers, and/or decimals in a given set, from least to greatest and greatest to least.	Unit 6: 1.3, 1.4, 1.5, 1.7, 1.8, 2.3, 2.5, 2.6, 2.7, 2.8, 2.9

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5.3 The student will	
a) identify and describe the characteristics of prime and composite numbers; and	Unit 1: 1.2, 1.5
b) identify and describe the characteristics of even and odd numbers.	Unit 1: 1.2, 1.3, 1.5
Computation and Estimation	
5.4 The student will create and solve single-step and multistep practical problems involving addition, subtraction, multiplication, and division of whole numbers.	Unit 1: 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7 Unit 4: 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 3.1, 3.2, 3.3, 3.4, 3.5 Unit 7: 1.1, 1.2, 1.3, 1.4, 1.5, 1.7, 1.8 Unit 8: 2.3, 2.4, 2.5
5.5 The student will	
a) estimate and determine the product and quotient of two numbers involving decimals; and	Unit 6: 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9 Unit 7: 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 3.9, 3.10, 3.11 Unit 8: 2.2
b) create and solve single-step and multistep practical problems involving addition, subtraction, and multiplication of decimals, and create and solve single-step practical problems involving division of decimals.	Unit 6: 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9 Unit 7: 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 3.9, 3.10, 3.11 Unit 8: 2.2
5.6 The student will	
a) solve single-step and multistep practical problems involving addition and subtraction with fractions and mixed numbers; and	Unit 3: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 2.3, 2.5, 2.6, 2.7, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6 Unit 4: 1.1, 1.2, 1.3, 1.4, 1.5 Unit 6: 1.1, 1.2, 1.3
b) solve single-step practical problems involving multiplication of a whole number, limited to 12 or less, and a proper fraction, with models.	Unit 7: 1.1, 1.2, 1.3, 1.4, 1.5, 1.7, 1.8 Unit 8: 2.3, 2.4, 2.5
5.7 The student will simplify whole number numerical expressions using the order of operations.	Unit 1: 1.1, 1.4, 1.5, 2.1, 2.2, 2.3, 2.4, 2.5, 3.4, 3.5, 3.6, 3.7 Unit 3: 2.3, 2.4, 2.5, 3.1, 3.2 Unit 4: 2.1 Unit 5: 1.5, 1.6, 1.7, 2.4, 2.5, 2.6, 2.7 Unit 8: 2.1, 2.2, 2.3, 2.4, 2.5

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Measurement and Geometry	
5.8 The student will	
a) solve practical problems that involve perimeter, area, and volume in standard units of measure; and	Unit 2: 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 2.1, 2.2, 2.3, 2.4 Unit 8: 2.1, 2.2, 2.3, 2.4, 2.5
b) differentiate among perimeter, area, and volume and identify whether the application of the concept of perimeter, area, or volume is appropriate for a given situation.	Unit 2: 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 2.1, 2.2, 2.3, 2.4 Unit 8: 2.1, 2.2, 2.3, 2.4, 2.5
5.9 The student will	
a) given the equivalent measure of one unit, identify equivalent measurements within the metric system; and	Unit 7: 3.8, 3.9, 3.10, 3.11 Unit 8: 1.1, 1.3, 2.1
b) solve practical problems involving length, mass, and liquid volume using metric units.	Unit 7: 3.8, 3.9, 3.10, 3.11 Unit 8: 1.1, 1.3, 2.1
5.10 The student will identify and describe the diameter, radius, chord, and circumference of a circle.	For related content, please see: Unit 8: 2.1, 2.2, 2.5
5.11 The student will solve practical problems related to elapsed time in hours and minutes within a 24-hour period.	For related content, please see: Unit 3: 2.1, 2.2, 2.3
5.12 The student will classify and measure right, acute, obtuse, and straight angles.	For related content, please see: Unit 8: 1.1
5.13 The student will	
a) classify triangles as right, acute, or obtuse and equilateral, scalene, or isosceles; and	Unit 8: 1.1
b) investigate the sum of the interior angles in a triangle and determine an unknown angle measure.	For related content, please see: Unit 8: 1.1
5.14 The student will	
a) recognize and apply transformations, such as translation, reflection, and rotation; and	For related content, please see: Unit 5: 2.5, 2.6, 2.7

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b) investigate and describe the results of combining and subdividing polygons.	For related content, please see: Unit 8: 1.1, 1.2, 1.3, 1.4, 1.5
Probability and Statistics	
5.15 The student will determine the probability of an outcome by constructing a sample space or using the Fundamental (Basic) Counting Principle.	Unit 3: 3.4, 3.5, 3.6 Unit 4: 3.1, 3.2, 3.3, 3.4, 3.5
5.16 The student, given a practical problem, will	
a) represent data in line plots and stem-and-leaf plots;	Unit 3: 3.4, 3.5, 3.6 Unit 4: 3.1, 3.2, 3.3, 3.4, 3.5 Unit 5: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 2.4, 2.5, 2.6, 2.7
b) interpret data represented in line plots and stem-and-leaf plots; and	Unit 3: 3.4, 3.5, 3.6
c) compare data represented in a line plot with the same data represented in a stem-and-leaf plot.	Unit 3: 3.4, 3.5, 3.6
5.17 The student, given a practical context, will	
a) describe mean, median, and mode as measures of center;	For related content, please see: Unit 3: 3.4, 3.5, 3.6 Unit 4: 3.1, 3.2, 3.3, 3.4, 3.5 Unit 5: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 2.4, 2.5, 2.6, 2.7
b) describe mean as fair share;	For related content, please see: Unit 3: 3.4, 3.5, 3.6 Unit 4: 3.1, 3.2, 3.3, 3.4, 3.5 Unit 5: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 2.4, 2.5, 2.6, 2.7
c) describe the range of a set of data as a measure of spread; and	For related content, please see: Unit 3: 3.4, 3.5, 3.6 Unit 4: 3.1, 3.2, 3.3, 3.4, 3.5 Unit 5: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 2.4, 2.5, 2.6, 2.7

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d) determine the mean, median, mode, and range of a set of data.	For related content, please see: Unit 3: 3.4, 3.5, 3.6 Unit 4: 3.1, 3.2, 3.3, 3.4, 3.5 Unit 5: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 2.4, 2.5, 2.6, 2.7
Patterns, Functions, and Algebra	
5.18 The student will identify, describe, create, express, and extend number patterns found in objects, pictures, numbers and tables.	Unit 5: 1.4, 1.6, 1.7, 2.1, 2.3, 2.4, 2.7
5.19 The student will	
a) investigate and describe the concept of variable;	Unit 5: 1.1, 1.2, 1.5, 1.6, 2.1
b) write an equation to represent a given mathematical relationship, using a variable;	Unit 1: 1.2, 2.3, 2.4, 2.5, 2.7, 3.6, 3.7 Unit 3: 3.3, 3.4 Unit 5: 2.5
c) use an expression with a variable to represent a given verbal expression involving one operation; and	Unit 1: 1.2, 2.3, 2.4, 2.5, 2.7, 3.6, 3.7 Unit 3: 3.3, 3.4 Unit 5: 2.5
d) create a problem situation based on a given equation, using a single variable and one operation.	Unit 5: 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 2.7