Richmond Public Schools

Curriculum Framework

Grade 1st

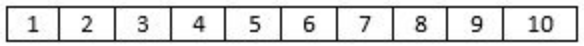
Strand: Number Sense
1.1 The student will a) count forward orally by ones to 110, starting at any number between 0 and 110; b) write the numerals 0 to 110 in sequence and out-of-sequence; c) count backward orally by ones when given any number between 1 and 30; and d) count forward orally by ones, twos, fives, and tens to determine the total number of objects to 110.
Suggested Pacing

Related Spiraling Standards	
K.3 The student will a) count forward orally by ones from 0 to 100; b) count backward orally by ones when given any number between 1 and 10; 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 d) count forward by tens to determine the total number of objects to 100.	2.2 The student will a) count forward by twos, fives, and tens to 120, starting at various multiples of 2, 5, or 10; b) count backward by tens from 120; and c) use objects to determine whether a number is even or odd.
Essential Questions	**Common Misconceptions**
● How can we use tools (counters, objects, number lines, hundred charts, and calculators) to help us count to 110? ● How do we know what numbers come before and after a certain number? ● What is zero? When do we use zero? ● How do we count how many objects are in a set? ● How many ways can we represent a number (written form, place value representation)? ● How can we use tools (counters, objects, number lines, hundred charts, and calculators) to help us skip count?	-Students having trouble finding/using/seeing the pattern. -Students misapply the rule for reading numbers from left to right. -Students having difficulty with one to one counting.

● What patterns occur when we count by ones? … twos? … fives? … tens to 110? ● When is skip counting useful? ● What is different when counting backwards (between 1-30)?	
Understanding the Standard	**Essential Knowledge and Skills**
● There are three developmental levels of counting - rote sequence; - one-to-one correspondence; and - the cardinality of numbers. ● Counting involves two separate skills: verbalizing the list (rote sequence counting) of standard number words in order ("one, two, three,¼") and connecting this sequence with the items in the set being counted, using one-to-one correspondence. Association of number words with collections of objects is achieved by moving, touching, or pointing to objects as the number words are spoken. ● The last number stated represents the number of objects in the set. The total number of objects in the set is known as the cardinality of the set. After having a student count a collection of objects, the teacher may be able to assess whether the student has cardinality of number by asking the question, "How many are there?" Students who do not yet have cardinality of number are often unable to tell you how many objects there were without recounting them. ● Rote counting is a prerequisite skill for the understanding of addition (one more), subtraction (one less), and the ten-to-one concept of place value. ● Conservation of number is applied when students understand that a group of 10 objects is still 10 objects regardless of whether they are arranged in a cup, group, stack, etc.	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to** ● Count forward orally, by ones, from 0 to 110 starting at any number between 0 and 110. (a) ● Use the oral counting sequence to tell how many objects are in a set. (a) ● Write numerals 0-110 in sequence and out of sequence. (b) ● Count backward orally by ones when given any number between 1 and 30. (c) ● Count forward orally by ones, twos, fives, and tens to determine the total number of objects to 110. (d)

- Unitizing is the concept that a group of objects can be counted as one unit (e.g., 10 ones can be counted as 1 ten.)
- Using objects and asking the questions such as “How many are in each group?” or “How many groups are there?” and” What is the total number you have?” supports students as they learn to skip count and helps to solidify their understanding of cardinality and assists in developing multiplicative reasoning.
- The patterns developed as a result of skip counting are precursors for recognizing numeric patterns, functional relationships, and concepts underlying money, time, and multiplication.Powerful models for developing these concepts include counters, number paths, and hundred charts.

Example of a Number Path



- A number path is a counting model where each number is represented within a square and the squares can be clearly counted.
- A number line is a length model with each number being represented by its length from zero. When young children use a number line as a counting tool, they often confuse what should be counted, the numbers or the spaces between the numbers. A number path is more appropriate for students at this age.
- Counting backward by rote lays the foundation for subtraction.
- Skip counting by twos supports the development of the concept of even numbers and the development of multiplication facts for two.
- Skip counting by fives lays the foundation for telling time to the nearest five minutes, counting money, and developing the multiplication facts for five.

- Skip counting by tens is a precursor for place value, addition (10 more), subtraction (10 less), counting money, and developing the multiplication facts for ten.
- Manipulatives that can be physically connected and separated into groups of tens and leftover ones, such as connecting or snap cubes, beans on craft sticks, pennies in cups, bundle of sticks, or beads on pipe cleaners should be used.
- Ten-to-one trading activities with manipulatives on place value mats and base ten blocks are more appropriate in grade two.

Vocabulary

number	counting by ones
How many	counting by twos
numeral	counting by fives
count	counting by tens
Forward	zero
One-hundred ten	backward
Pattern	skip count
Number path	number line

Assessment

Powerschool – Exam identifier

Instructional Activities Organized by Learning Objective

Textbook
EnVision Math

- Lesson 1-1 Numbers 0-5 pg. 3A-6B (a, b)
- Ready Made Centers for Differentiated Instruction: Math in Motion Center Activity 1-1 Pg. 1-2 (a, b)

- Lesson 1-2 Numbers 6-10 pg. 7A-10B
- Ready Made Centers for Differentiated Instruction: Try Together Center Activity 1-2 Pg. 3-4 (a, b)

- Lesson 1-3 Numbers 10, 11, 12 pg. 11A-14B
- Ready Made Centers for Differentiated Instruction: Look and See Center Activity 1-4 Pg. 7-8 (a, b)

- Lesson 10-1 Making Numbers 11 to 20 pg. 263A-266B
- Ready Made Centers for Differentiated Instruction: Look and See Center Activity 10-1 Pg. 1-2 (a, b)

- Lesson 12-4 Ordering Numbers with a Hundred Chart pg. 343A-346B (a, b, c)
- Lesson 12-6 Before, After, and Between pg.351A-354B (a, b, c)

	● Lesson 10-3 Counting by 10s to 100 pg. 271A-274B (d) ● Lesson 10-4 Counting Patterns on a Hundred Chart pg. 275A-278A (d) ● Ready Made Centers for Differentiated Instruction: Look and See Center Activity 10-4 Pg. 7-8 (d) ● Lesson 10-5 Using Skip Counting pg. 279A-282A (d) ● Ready Made Centers for Differentiated Instruction: Helping Hands Center Activity 10-5 Pg. 9-10 (d) **Eureka Math:** 1.1 a ● GRADE 1 MODULE 4 LESSON 1: Compare the efficiency of counting by ones and counting by tens. ● GRADE 1 MODULE 6 LESSON 7: Count and write numbers to 120. Use Hide Zero cards to relate numbers 0 to 20 to 100 to 200. ● GRADE 1 MODULE 6 LESSON 8: Count to 120 in unit form using only tens and ones. Represent numbers to 120 as tens and ones on the place value chart ● GRADE 1 MODULE 6 LESSON 9: Represent up to 120 objects with a written numeral. 1.1b ● GRADE 1 MODULE 4 LESSON 1: Compare the efficiency of counting by ones and counting by tens. ● GRADE 1 MODULE 6 LESSON 7: Count and write numbers to 120. Use Hide Zero cards to relate numbers 0 to 20 to 100 to 200. ● GRADE 1 MODULE 6 LESSON 8: Count to 120 in unit form using only tens and ones. Represent numbers to 120 as tens and ones on the place value chart ● GRADE 1 MODULE 6 LESSON 9: Represent up to 120 objects with a written numeral.

	1.1c ● GRADE 1 MODULE 4 LESSON 5: Identify 10 more, 10 less, 1 more, and 1 less than a two-digit number ● GRADE 1 MODULE 4 LESSON 6: Use dimes and pennies as representations of tens and ones. ● GRADE 1 MODULE 6 LESSON 5: Identify 10 more, 10 less, 1 more, and 1 less than a two-digit number within 100. 1.1d ● GRADE K TOPIC D: Extend the Say Ten and Regular Count Sequence to 100 ● GRADE 2 MODULE 7 LESSON 6: Recognize the value of coins and count up to find their total value ● GRADE 2 MODULE 8 TOPIC D: Application of Fractions to Tell Time **Notes** **Resources** ● **Print** o **Teaching Student-Centered Mathematics (K-3 2006)** ▪ **Activity 5.10 pg. 138 Skip-Count Patterns** ▪ **Activity 5.20 pg.144 Nice-Number Skip Counts** ▪ **Activity 10.9 pg. 285 Calculator Skip Counting** o **Interactive Notebooks Math Grade 1** ▪ **Using a Hundreds Chart pg. 14 - 15** ● **Technology-based** o **Koala Karts (base ten counting)** ▪ **https://www.mathplayground.com/ASB_Koala_Karts.html** o **Count to 100**

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http://www.abcya.com/number_bubble_counting.htm

o Treasure Quest 100 Chart

https://www.mathplayground.com/treasure_quest_hundreds_chart.html

o 120 Chart

http://www.abcya.com/interactive_100_number_chart.htm

o Skip Count Video

https://www.mathplayground.com/video_skip_counting.html

o Skip Count

http://www.sheppardsoftware.com/mathgames/earlymath/BalloonPopSkip.htm

Station Activities/ Manipulatives

Insect, fruit, or pet counters-using counters, students will make groups of ones, twos, fives, and tens to find the total amount.
Counting and sorting set- Using the counting and sorting set, students will practice counting forward and backward from any number up to 110.
Base 10 magnetic kits- Using base ten blocks, students will skip count by tens and ones to 110.
Linking Cubes- Using 30 linking cubes, students will count backwards by taking one cube away till they have no more linking cubes.

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<td>Cross-Curricular Connections</td>
<td>Differentiation</td>
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• **Literature Connections** ○ **One Hundred Hungry Ants (1.1a)** ○ **Mouse Count (1.1c)** ○ **Leaping Lizards (1.1d)** ○ **Spunky Monkeys On Parade (1.1d)**	

Richmond Public Schools

Curriculum Framework

Grade 1st

Strand: Number Sense	
1.2	**The student, given up to 110 objects, will** a) group a collection into tens and ones and write the corresponding numeral; 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 c) order three or fewer sets from least to greatest and greatest to least.
Suggested Pacing	
Related Spiraling Standards	
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** **b) compare and order sets from least to greatest and greatest to least.**	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; b) identify the number that is 10 more, 10 less, 100 more, and 100 less than a given number up to 999; c) compare and order whole numbers between 0 and 999; and d) round two-digit numbers to the nearest ten.
Essential Questions	**Common Misconceptions**
● How do we count how many objects are in a set? ● How does grouping by tens and ones help us tell how many? ● How does grouping by tens and ones help us say and write numbers? ● How does the position (place) of a digit in a number affect the value of that digit? ● How do we compare numbers (presented concretely) through 30 using words (greater than, less than, equal to)? ● How can we compare numbers (presented concretely) through 110 using words (greater than, less than, equal to)?	-When counting tens and ones (or hundreds, tens, and ones), students misapply the procedure for counting on and treats tens and ones (or hundreds, tens, and ones) as separate numbers. -Students have an alternative conception of multidigit numbers and see them as numbers independent of place value.

● How can I order three or fewer sets (greatest to least, least to greatest)?	-Students recognize simple multi-digit numbers, such as thirty (30) or 400 (four hundred), but they do not understand that the position of a digit determines its value - Students order numbers based on the value of the digits, instead of place value. -Students apply the alternate conception "Write the numbers you hear" when writing numbers in standard form when given the number in words. -Students lack the concept that 10 in any position (place) makes one (group) in the next position and vice versa
Understanding the Standard	**Essential Knowledge and Skills**
● Conservation of number is applied when students understand that a group of 10 objects is still 10 objects regardless of whether they are arranged in a cup, group, stack, etc. ● Unitizing is the concept that a group of objects can be counted as one unit (e.g., 10 ones can be counted as 1 ten). ● The number system is based on a pattern of tens where each place has 10 times the value of the place to its right. This is known as the ten-to-one concept of place value. ● Opportunities to experience the relationships among tens and ones through hands-on experiences with manipulatives are essential to developing the ten-to-one place value concept of our number system and to understanding the value of each digit in a two-digit number. ● Models that clearly illustrate the relationships among tens and ones as physically proportional are most appropriate for this grade (e.g., the tens piece is 10 times larger than the ones piece). ● Knowledge of place value is essential when comparing numbers.	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to** ● Group a collection of up to 110 objects into sets of tens and ones. (a) ● Write the numeral that corresponds to the total number of objects in a given collection of up to 110 objects that have been grouped into sets of tens and ones. (a) ● Identify the place and value of each digit in a two-digit numeral (e.g., in the number 23, the 2 is in the tens place and the value of the 2 is 20). (a) ● Identify the number of tens and ones that can be made from any number up to 100 (e.g., 47 is 47 ones or can also be grouped into 4 tens with 7 ones left over). (a) ● Compare two numbers between 0 and 110 represented pictorially or with concrete objects, using the words *greater than, less than* or *equal to.* (b) ● Order three or fewer sets, each set containing up to 110 objects, from least to greatest and greatest to least. (c)

- Students are generally familiar with the concept of *more* and have limited experience with the term *less*. It is important to use the terms together to build understanding of their relationship. For example, when asking which group has more, follow by asking which group has fewer.
- Recording the numeral when using physical and pictorial models leads to an understanding that the position of each digit in a numeral determines the size of the group it represents.
- Manipulatives that can be physically connected and separated into groups of tens and leftover ones, such as connecting or snap cubes, beans on craft sticks, pennies in cups, bundle of sticks, or beads on pipe cleaners should be used.
- Ten-to-one trading activities with manipulatives on place value mats and base-ten blocks are more appropriate in grade two.

Vocabulary

number
numeral
count
place value
tens
Ones
less than
greater than
equal to
least
greatest
compare

Assessment

Powerschool – Exam identifier

Instructional Activities Organized by Learning Objective

Textbook
EnVision Math

- Lesson 11-2 Numbers Made With Tens pg. 307A-310B (a)
- Lesson 11-3 Tens and Ones pg. 311A-314B (a)
- Ready Made Centers for Differentiated Instruction: Helping Hands Center Activity 11-3 pg. 5-6 (a)
- Lesson 11-1 Counting with Groups of 10 and Leftovers pg. 303A-306B (a)
- Ready Made Centers for Differentiated Instruction: Play a Game Center Activity 11-1 pg. 1-2 (a)

- Lesson 2-1 Comparing Two Numbers pg. 31A-34B (b)
- Ready Made Centers for Differentiated Instruction: Try Together Center Activity 2-1 Pg. 1-2 (b)
- Lesson 2-2 Ordering Three Numbers pg. 35A-38B (c)

	● Ready Made Centers for Differentiated Instruction: Play a Game Center Activity 2-2 Pg. 3-4 (C) ● Lesson 2-4 Problem Solving: Act it Out pg. 43A-46B (c) ● Topic 12 Interactive Story "The Store Needs More" (b) **Eureka Math:** 1.2 a ● GRADE 1 MODULE 2 TOPIC D: Varied Problems with Decompositions of Teen Numbers as 1 Ten and Some Ones ● GRADE 1 MODULE 4 TOPIC A: Tens and Ones ● GRADE 1 MODULE 4 LESSON 23: Interpret two-digit numbers as tens and ones, including cases with more than 9 ones. ● GRADE 1 MODULE 6 LESSON 3: Use the place value chart to record and name tens and ones within a two-digit number up to 100. ● GRADE 1 MODULE 6 LESSON 4: Write and interpret two-digit numbers to 100 as addition sentences that combine tens and ones. 1.2 b ● GRADE 1 MODULE 4 TOPIC B: Comparisons of Pairs of Two-Digit Numbers ● GRADE 1 MODULE 6 LESSON 6: Use the symbols >, =, and < to compare quantities and numerals to 100. 1.2 c ● GRADE 1 MODULE 4 TOPIC B: Comparisons of Pairs of Two-Digit Numbers ● GRADE 1 MODULE 6 LESSON 6: Use the symbols >, =, and < to compare quantities and numerals to 100. **Notes**

	Resources ● **Print** o **Teaching Student-Centered Mathematics (K-3 2006)** ▪ **Developing Place-Value Concepts and Procedures pg. 129 (a)** ▪ **Activity 5.1 pg. 129 Counting in Groups (a)** ▪ **Activity 5.2 pg. 130 Groups of 10 (a)** ▪ **Activity 5.4 pg. 133 Odd Groupings (a)** ▪ **Activity 5.6 pg. 134 Base-Ten Riddles (a)** ▪ **Activity 5.7 pg. 134-135 Counting Rows of 10 (a)** ▪ **Activity 5.8 pg. 135 Counting with Base-Ten Models (a)** ▪ **Activity 5.9 pg. 135 Tens, Ones, and Fingers (a)** ▪ **Activity 5.10 pg. 138 Skip-Count Patterns (a)** ▪ **Activity 5.20 pg.144 Nice-Number Skip Counts (a)** ▪ **Activity 10.9 pg. 285 Calculator Skip Counting (a)** ▪ **Activity 2.1 Make Sets of More/Less/ Same pg. 38 (b)** ▪ **Activity 2.2 Find the Same Amount pg. 38 (b)** ▪ **Activity 5.17 Who Am I? pg. 142 (c)** ▪ **Activity 5.18 Who Could They Be? pg. 143 (c)** ▪ **Activity 5.19 Close, Far, and in Between pg. 143 (c)** o **Interactive Notebooks Math Grade 1** ▪ **Tens and Ones pg. 16 (a)**

	• **Technology-based** o **Place Value Video** ▪ **https://www.mathplayground.com/video_place_value.html** o **Place Value Party** ▪ **https://www.mathplayground.com/place_value_party.html** o **Ordering Numbers** **Balloon Pop Order 1** ▪ **https://www.sheppardsoftware.com/mathgames/earlymath/BalloonPopComparison.htm** **Balloon Pop Order 2** ▪ **https://www.sheppardsoftware.com/mathgames/earlymath/BalloonPopOrder2.htm** **Ordering Numbers** ▪ **http://www.softschools.com/math/ordering_numbers/** **Balloon Pop V Order Numbers** ▪ **https://www.sheppardsoftware.com/mathgames/earlymath/BalloonPopVOrder2.htm** o **Greater than, Less than, Equal To** ▪ **http://www.abcya.com/comparing_number_values_jr.htm** **Station Activities/ Manipulatives** Insect, fruit, pet counters- Using counters, the students will group objects into tens and ones to represent a numeral. Base 10 magnetic kits- Students will display the visual representation of a number shown using base ten magnetic kits. Counting and sorting set- Using the counting and sorting set, the students will group and compare sets of three from greatest to least and least to greatest.

	Foam base 10s- Using foam base 10s, the students will create three numbers and order them from greatest to least and least to greatest.
Cross-Curricular Connections	**Differentiation**
• **Literature Connections** o **A Fair Bear Share (1.2a)** o **More or Less (1.2b)** o **Just Enough Carrots (1.2b)**	• Greater Alligator Game **http://www.softschools.com/math/greater_than_less_than/alligator_greater_than_game/** working with symbols • **Interactive Notebooks Math Grade 1** o **Comparing Numbers pg. 22 - 23 (c)**

Richmond Public Schools

Curriculum Framework

Grade 1st

Strand: Number Sense	
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.	
Suggested Pacing	
Related Spiraling Standards	
	2.3 The student will a) count and identify the ordinal positions first through twentieth, using an ordered set of objects; and b) write the ordinal numbers 1st through 20th.
Essential Questions	**Common Misconceptions**
● What number words (first through tenth) can we use to describe our place (order) in a line? ● How are counting numbers similar to ordinal (order) numbers? How are they different? ● How do we know if an object is first, second, third, fourth, fifth, sixth, seventh, eighth, ninth, or tenth? ● Why does an object's position name (ordinal number) change if we count from left-to-right instead of right-to-left? …bottom-to-top instead of top-to-bottom?	-Students mixing up language between left and right, top and bottom -Students adding "th" to first, second and third -Students confuse ordinal numbers with numeral (example the dog is in "three" place instead of "third")
Understanding the Standard	**Essential Knowledge and Skills**
● An understanding of the cardinal and ordinal meanings of numbers is necessary to quantify, measure, and identify the order of objects.	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**

Richmond Public Schools

Curriculum Framework

Grade 1st

- An ordinal number is a number that names the place or position of an object in a sequence or set (e.g., first, third). *Ordered position*, *ordinal position*, and *ordinality* are terms that refer to the place or position of an object in a sequence or set.
- The ordinal position is determined by where one starts in an ordered set of objects or sequence of objects.
- The ordinal meaning of numbers is developed by identifying and verbalizing the place or position of objects in a set or sequence (e.g., the student's position in line when students are lined up alphabetically by first name).
- Students at this level do not need to recognize or read the written words for ordinal numbers (i.e., first, second, third, etc.).
- Practical applications of ordinal numbers can be experienced through calendar and patterning activities.

- Identify the ordinal positions first through tenth using ordered sets of 10 objects and/or pictures of such sets presented from:
  - left to right;
  - right to left;
  - top to bottom; and/or
  - bottom to top.

Vocabulary

first	second
third	fourth
fifth	sixth
seventh	eighth
ninth	tenth
ordinal numbers	position
left to right	right to left
Top to bottom	bottom to top
First through tenth	

Assessment

Powerschool – Exam identifier

Instructional Activities Organized by Learning Objective

Textbook
EnVision Math

- **Lesson 10-7 Ordinals Through Twentieth pg. 287A-290B**
- **Ready Made Centers for Differentiated Instruction: Try Together Center Activity 10-7 Pg. 13-14**

Eureka Math:
1.3

- GRADE K MODULE 6 LESSON 4: Describe the relative position of shapes using ordinal numbers.

Notes

Resources

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- **Print**

- **Technology-based**
  - **Turtle Diary**
    - **https://www.turtlediary.com/game/ordinal-numbers.html**
  - **Ordinal Wash Line**
    - **http://www.crickweb.co.uk/ks1numeracy.html#**

Station Activities/ Manipulatives
Square tiles-Using square tiles, the student will create a line of squares to ordinally count from left to right and right to left.

Linking cubes- Using linking cubes, the student will stack the cubes to count each cube ordinally from bottom to top and top to bottom.

Number lines- Using a number line, the student will point to the numbers while verbally counting its ordinal position.
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<th>Cross-Curricular Connections</th>
<th>Differentiation</th>
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- **Literature Connections**
  - **Ten Little Rubber Ducks**
  - **Seven Blind Mice**
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Richmond Public Schools

Curriculum Framework

Grade 1st

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Curriculum Framework

Grade 1st

Strand: Number Sense	
1.4 The student will **a) represent and solve practical problems involving equal sharing with two or four sharers; and** **b) represent and name fractions for halves and fourths, using models.**	
Suggested Pacing	
Related Spiraling Standards	
K.5 The student will investigate fractions by representing and solving practical problems involving equal sharing with two sharers.	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; b) represent fractional parts with models and with symbols; and c) compare the unit fractions for halves, fourths, eighths, thirds, and sixths, with models.
Essential Questions	**Common Misconceptions**
● What is a fraction? What do we mean when we say that a fraction names equal parts of a whole? ● How can we use region models to show wholes, halves, and fourths of objects? ● How can we use set models to show wholes, halves, and fourths of a group (set)? ● How can I share a whole with two or four sharers (given a practical situation)? ● How can I describe fair shares of halves and fourths given a practical situations?	-Students name fraction as part/part instead of part/whole -Students do not understand that when finding fractions of amounts, lengths, or areas, the parts need to be equal in size -Students think that when finding fractions using area models, the equal-sized pieces must look the same. -Students do not understand that fractions are numbers as well as portions of a whole. -Students have restricted their definitions and think fractions have to be less than 1
Understanding the Standard	**Essential Knowledge and Skills**

● Practical situations with fractions should involve real-life problems in which students themselves determine how to subdivide a whole into equal parts, test those parts to be sure they are equal, and use those parts to re-create the whole. ● When working with fractions, the whole must be defined. ● Fractions can have different meanings: part-whole, division, measurement, ratio, and operator. The focus of this grade level is to develop the idea of equal sharing (division) and part-whole relationships. Fraction notation will be introduced in grade two. ● An equal sharing problem is an idea that young children understand intuitively because of their experiences sharing objects with siblings, friends, etc. Consider the following examples: ○ Two children sharing six sandwiches ○ Two children sharing one sandwich ○ Four children sharing one piece of paper ○ Four children sharing two brownies ● Fraction models that can be continuously divided should be used at this grade (e.g., cookies, brownies). It is important to use models that can be continuously divided when there are remainders so those remainders can be cut into as many equal parts as needed. ● Students should be encouraged to observe and state what happens as you add more sharers, noticing that when more sharers are added, the smaller the share will be for each person. ● Equal parts may be different shapes but maintain the same value (e.g., a sandwich could be cut in two equal pieces vertically, horizontally, or diagonally to represent halves). ● The words *denominator* and *numerator* are not required at this grade, but the concepts of part and whole are required for understanding of a fraction. ● Students should use the vocabulary for halves and fourths, but should not be expected to use fraction notation at this level. Informal, integrated experiences with fractions at this level will help students develop a foundation for deeper learning at later	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to** ● Share a whole equally with two or four sharers, when given a practical situation. (a) ● Represent fair shares pictorially, when given a practical situation. (a) ● Describe shares as equal pieces or parts of the whole (e.g., halves, fourths), when given a practical situation. (a) ● Represent halves and fourths of a whole, using a region/area model (e.g., pie pieces, pattern blocks, paper folding, and drawings). (b) ● Name fractions represented by drawings or concrete materials for halves and fourths. (b)

grades. Understanding the language of fractions furthers this development.

- Students should have opportunities to make connections and comparisons among fraction representations by connecting concrete or pictorial representations with spoken representations (e.g., “one-half,” “one out of two equal parts, ”or “one-half is more than one-fourth of the same whole”).

Vocabulary

fair share	equal pieces	parts
share equally		
whole	half	fourths
halves		
Fraction		

Assessment

Powerschool – Exam identifier

Instructional Activities Organized by Learning Objective

Textbook
Eureka Math:

1.4 a

- GRADE 2 MODULE 8 LESSON 8: Interpret equal shares in composite shapes as halves, thirds, and fourths.
- GRADE 2 MODULE 8 TOPIC C: Halves, Thirds, and Fourths of Circles and Rectangles
- GRADE 2 MODULE 8 LESSON 13: Construct a paper clock by partitioning a circle into halves and quarters, and tell time to the half hour or quarter hour.

1.4 b

- GRADE 2 MODULE 8 LESSON 8: Interpret equal shares in composite shapes as halves, thirds, and fourths.
- GRADE 2 MODULE 8 TOPIC C: Halves, Thirds, and Fourths of Circles and Rectangles
- GRADE 2 MODULE 8 LESSON 13: Construct a paper clock by partitioning a circle into halves and quarters, and tell time to the half hour or quarter hour.

Notes

Resources

	• **Print**
	  o **Teaching Student-Centered Mathematics (K-3 2006)**
	  ▪ **Sharing and the Concept of Fractional Parts pg. 252 - 253**
	
	• **Technology-based**
	  o **Fractions**
	  ▪ **https://www.khanacademy.org/math/cc-1st-grade-math/cc-1st-geometry/modal/v/halves-and-fourths**
	  ▪ **http://www.sheppardsoftware.com/mathgames/earlymath/fractions_shoot.htm**
	  o **Fair Share**
	  ▪ **http://pbskids.org/video/peg/2365082206**
	  ▪ **http://pbskids.org/peg/games/rock-art**
	  ▪ **http://pbskids.org/curiousgeorge/busyday/dogs/**
	
	Station Activities/ Manipulatives
	
	Fraction Circles and Fraction Tiles: When given f**raction circles and/or fraction tiles** the student will represent and solve problems involving equal sharing with two or four sharers.
	
	Fraction Circles and Fraction Tiles: When given f**raction circles and/or fraction tiles** the student will represent and name fractions for halves and fourths.

Cross-Curricular Connections	**Differentiation**

• **Literature Connections** ○ **Give Me Half!** ○ **Apple Fractions** ○ **Eating Fractions** ○ **The Doorbell Rang**	

Richmond Public Schools

Curriculum Framework

Grade 1st

Strand: Number Sense	
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 b) explain the reasonableness of the choice.	
Suggested Pacing	
Related Spiraling Standards	
	2.6 The student will a) estimate sums and differences;
Essential Questions	**Common Misconceptions**
● What is an estimate? ● Why is estimating useful? ● How can I describe why my estimate is reasonable? ● How do we decide whether an estimate should be a one-, two-, or three-digit number?	-Students may overestimate or underestimate -Students may be tempted to count for the exact number verses estimating -Students confuse magnitude
Understanding the Standard	**Essential Knowledge and Skills**

- Magnitude refers to the size of a set.
- Exploring ways to estimate the number of objects in a set, based on appearance (e.g., clustering, grouping, comparing), enhances the development of number sense.
- To estimate means to determine a number that is close to the exact amount. When asking for an estimate, teachers might ask, "A*bout* how much?" or "A*bout* how many?" or "Is this about 10 or about 50?"
- Students should be provided opportunities to estimate a quantity, given a benchmark of 10 and/or 100 objects.

The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to

- Select a reasonable order of magnitude for a given set from three given quantities: a one-digit numeral, a two-digit numeral, and a three-digit numeral (e.g., 5, 50, or 500 jelly beans in jars) in a familiar problem situation. (a)
- Explain why a particular estimate was chosen as the most reasonable from three given quantities (a one-digit numeral, a two-digit numeral, and a three-digit numeral), given a familiar problem situation. (b)

Vocabulary

Estimate
One-digit numeral
three-digit numeral
reasonable
magnitude
two-digit numeral

Powerschool – Exam identifier

Instructional Activities Organized by Learning Objective

Textbook
Eureka Math:
1.5 a

- GRADE 1 MODULE 4 TOPIC B:Comparisons of Pairs of Two-Digit Numbers
- GRADE 1 MODULE 6 LESSON 6: Use the symbols >, =, and < to compare quantities and numerals to 100.
- GRADE 2 MODULE 3 TOPIC F:Comparing Two Three-Digit Numbers

1.5b

- GRADE 1 MODULE 4 TOPIC B:Comparisons of Pairs of Two-Digit Numbers
- GRADE 1 MODULE 6 LESSON 6: Use the symbols >, =, and < to compare quantities and numerals to 100.

Notes

Resources

- **Print**

	o Teaching Student-Centered Mathematics (K-3 2006) **▪ Estimation and Measurement pg. 58 - 60** **▪ 2.32 Is It Reasonable? pg. 60** ● **Technology-based** **o Estimation SMARTboard** **▪ Estimation Station** **▪ Magnitude Math Lessons** **▪ Guess It** **Station Activities/ Manipulatives** Square tiles-The student will observe a collection of square tiles to guess the magnitude. Foam base 10s-Using foam base ten blocks, the student will compare the amounts known from the foam base ten blocks with a collection of counters or tiles to help make the best estimate. Insect, fruit and pet counters-The student will observe a collection of counters to guess the magnitude. Foam 2-color counters-The student will observe a collection of counters to guess the magnitude.
Cross-Curricular Connections	**Differentiation**

• **Literature Connections**
  ○ **The Right Number of Elephants**
  ○ **How Many Seeds in a Pumpkin**	

Richmond Public Schools

Curriculum Framework

Grade 1st

Strand: Computation and Estimation	
1.6 The student will create and solve single-step story and picture problems using addition and subtraction within 20.	
Suggested Pacing	
Related Spiraling Standards	
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.	2.6 The student will a) estimate sums and differences; b) determine sums and differences, using various methods; and c) create and solve single-step and two-step practical problems involving addition and subtraction.
Essential Questions	**Common Misconceptions**
● What real life questions can be answered using addition and/or subtraction? ● How can "acting out" a single step story problem with models help us solve it? ● How can we create a story problem to match a number sentence? ● How can we write a number sentence to match a story problem? ● How can I combine parts contained in larger numbers up to 20 by using related combinations? (eg 9 + 7 can be thought of as 10 + 6; making a ten strategy) ● How can I explain the strategy I used to solve addition and subtraction problems (within 20)?	-Students may know the associative property of addition, but fail to apply it to simplify the "work" of addition -Students may be unable to generalize methods that they already know for addition and subtraction to a new situation. -Students have overspecialized during the learning process so that they recognize some addition and/or subtraction situations as addition or subtraction but fail to classify other situations appropriately. -Students know how to add but do not know when to add (other than because they are told to do so, or because the computation was written as an addition problem). -Students confuse language when adding or subtracting.
Understanding the Standard	**Essential Knowledge and Skills**
● Addition and subtraction should be taught concurrently in order to develop understanding of the inverse relationship. ● The problem-solving process is enhanced when students:	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**

• create their own story problems; • visualize the action in the story problem and draw a picture to show their thinking; and • model the problem using manipulatives, representations, or number sentences/equations. ● The least number of steps necessary to solve a single-step problem is one. ● In problem solving, emphasis should be placed on thinking and reasoning rather than on keywords. Focusing on key words such as *in all, altogether, difference,* etc., encourages students to perform a particular operation rather than make sense of the context of the problem. A key-word focus prepares students to solve a limited set of problems and often leads to incorrect solutions as well as challenges in upcoming grades and courses. ● Provide practice in the use and selection of strategies. Encourage students to develop efficient strategies. Examples of strategies for developing the basic addition and subtraction facts include: • counting on; • counting back; • "one more than," "two more than"; • "one less than," "two less than"; • "doubles" (e.g., 6 + 6 =__); • "near doubles" (e.g., 7 + 8 = (7 + 7) + 1 = or (8 + 8) – 1); • "make ten" (e.g., 7 + 4 can be thought of as 7 + 3 + 1 in order to make a 10); • "think addition for subtraction" (e.g., for 9 – 5 = __, think "5 and what number makes 9?"); • use of the commutative property (e.g., 14 +3 is the same as 3 + 14); • use of related facts (e.g., 14 + 3 = 17 , 3 + 14 = 17, 17 – 4 = 13, and 17 – 13 = 4); • use of the additive identity property (e.g., 14 + 0 = 14); and	● Create and solve single-step oral or written story and picture problems, using addition and subtraction within 20. ● Identify a number sentence to solve an oral or written story and picture problem, selecting from among addition and/or subtraction equations (e.g., number sentences). ● Combine parts contained in larger numbers up to 20 by using related combinations (e.g., 9 + 7 can be thought of as 9 broken up into 2 and 7; using doubles, 7 + 7 = 14; 14 + 2 = 16 or 7 broken up into 1 and 6; making a ten, 1 + 9 = 10; 10 + 6 = 16). ● Explain strategies used to solve addition and subtraction problems within 20 using spoken words, objects, pictorial models, and number sentences.

• use patterns to make sums (e.g., 0 + 15 = 15, 1 + 14 = 15, 2 + 13 = 15, etc.). ● Students at this level are not expected to use the parentheses or to name the properties. ● Students should develop fluency with facts to 10 and then use strategies and known facts to 10 to determine facts to 20. ● Flexibility with facts to 10 should be applied to facts to 20 (e.g., when adding 4 + 7, it is appropriate to think of 4 as 3 + 1 in order to combine 3 and 7 to make a 10 whereas adding 4 + 8, it is appropriate to think of 4 as 2 + 2 in order to combine 8 and 2 to make a 10). ● Extensive research has been undertaken over the last several decades regarding different problem types. Many of these studies have been published in professional mathematics education publications using different labels and terminology to describe the varied problem types. ● Students should have exposure to a variety of problem types related to addition and subtraction. Examples are represented in the chart below. It is important to note that Join Problems (with start unknown), Separate Problems (with start unknown), Compare Problems (with larger unknown – using "fewer") and Compare problems (with smaller unknown – using "more") are the most difficult and should be mastered in grade two.	

Richmond Public Schools

Curriculum Framework

Grade 1st

GRADE 1: COMMON ADDITION AND SUBTRACTION PROBLEM TYPES		
Join (Result Unknown)	Join (Change Unknown)	Join (Start Unknown)
Sue had 9 pencils. Alex gave her 5 more pencils. How many pencils does Sue have altogether?	Sue had 9 pencils. Alex gave her some more pencils. Now Sue has 14 pencils. How many did Alex give her?	Sue had some pencils. Alex gave her 5 more. Now Sue has 14 pencils. How many pencils did Sue have to start with?
Separate (Result Unknown)	Separate (Change Unknown)	Separate (Start Unknown)
Brooke had 10 cookies. She gave 6 cookies to Joe. How many cookies does Brooke have now?	Brooke had 10 cookies. She gave some to Joe. She has 4 cookies left. How many cookies did Brooke give to Joe?	Brooke had some cookies. She gave 6 to Joe. Now she has 4 cookies left. How many cookies did Brooke start with?
Part-Part-Whole (Whole Unknown)	Part-Part-Whole (One Part Unknown)	Part-Part-Whole (Both Parts Unknown)
Lisa has 4 red markers and 8 blue markers. How many markers does she have?	Lisa has 12 markers. Four of the markers are red, and the rest are blue. How many blue markers does Lisa have?	Lisa has a pack of red and blue markers. She has 12 markers in all. How many markers could be red? How many could be blue?
Compare (Difference Unknown)	Compare (Bigger Unknown)	Compare (Smaller Unknown)
Ryan has 7 books and Chris has 2 books. How many more books does Ryan have than Chris? Ryan has 7 books. Chris has 2 books. How many fewer books does Chris have than Ryan?	Chris has 2 books. Ryan has 5 more books than Chris. How many books does Ryan have? Chris has 5 fewer books than Ryan. Chris has 2 books. How many books does Ryan have?	Ryan has 2 more books than Chris. Ryan has 7 books. How many books does Chris have? Chris has 5 fewer books than Ryan. Ryan has 7 books. How many books does Chris have?

Vocabulary

addition
sum
minus
number sentence
related facts
Counting on
One more than
Two more than
Doubles
Make ten
plus
subtraction
difference
equation
story problem
counting back
one less than
two less than
near doubles
Symbol: + (add)

Instructional Activities Organized by Learning Objective

Textbook
EnVision

- **Lesson 3-5 Stories About Joining pg. 67A-70B**
- **Ready Made Centers for Differentiated Instruction: Play a Game Center Activity 3-5 pg. 9-10**
- **Lesson 4-5 Stories About Separating pg. 99A-102B**
- **Topic 4 Interactive Math Story "Subtraction Dance Party" pg. 81G-81H**
- **Lesson 10-2 Using Numbers 11 to 20 pg. 267A-270B**

Symbol: - (subtract) part of ten
Part-whole relationship

Assessment

Powerschool – Exam identifier

- **Topic 16 Interactive Math Story "Monkey Doubles" pg. 479G-479H**
- **Lesson 16-1 Doubles pg. 481A-484B**
- **Lesson 16-2 Doubles Plus 1 pg. 485A-488B**
- **Lesson 16-5 Making a 10 to Add 9 pg. 498A-500B**
- **Topic 17 Interactive Math Story "Robots at Work" pg. 515G-515H**
- **Lesson 17-5 Problem Solving: Draw a Picture and Write a Number Sentence pg. 533A-536B**
- **Lesson 6-6 Problem Solving: Draw a Picture and Write a Number Sentence pg. 163A-166B**
- **Lesson 7-5 Problem Solving: Draw a Picture and Write a Number Sentence pg. 187A-190B**

Eureka Math:
1.6

- GRADE 1 MODULE 4 TOPIC E:Varied Problem Types Within 20

Notes

Resources

- **Print**
  - **Teaching Student-Centered Mathematics (K-3 2006)**
    - **Using Contextual Problems pg. 70-72**
    - **More Thoughts About Children Solving Story Problems pg. 86-91**
  - **Interactive Notebooks Math Grade 1**
    - **Word Problems: Addition pg. 38 - 39**
    - **Word Problems: Subtraction pg. 44 - 45**
    - **Word Problems: Comparing Amounts pg. 46 - 47**

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<tr><td></td><td>

- **Technology-based**
  - **Add and Subtract**
    - **Abcya Word Problems Add and Subtract**
    - **Mathplayground - Addition - Thinking Blocks**

Station Activities/ Manipulatives
Insect counters, Fruit counters, Pet counters: When given 20 or less **insect counters, fruit counters, and pet counters** the student will create a story problem using addition and subtraction.

Linking cubes and 0-9 cubes: When given **linking cubes** and **0 - 9 cubes**, the student will roll the 0 - 9 cube two times and model the equation with the linking cubes. The student will then write a single step story problem to go with the model.
</td></tr>
<tr><th>Cross-Curricular Connections</th><th>Differentiation</th></tr>
<tr><td>

- **Literature Connections**
  - **Splash!**
  - **Elevator Magic**
  - **Rooster's Off To See The World**
</td><td></td></tr>
</table>

Richmond Public Schools

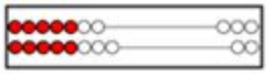
Curriculum Framework

Grade 1st

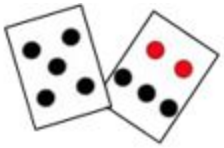
Strand: Computation and Estimation	
1.7 The student will **a) recognize and describe with fluency part-whole relationships for numbers up to 10; and** **b) demonstrate fluency with addition and subtraction within 10.**	
Suggested Pacing	
Related Spiraling Standards	
K.4 The student will a) recognize and describe with fluency part-whole relationships for numbers up to 5; and b) investigate and describe part-whole relationships for numbers up to 10.	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 b) demonstrate fluency with addition and subtraction within 20.
Essential Questions	**Common Misconceptions**
● How is addition like combining? What words do we use when we describe adding? ● How is addition like separating? What words do we use when we describe subtracting? ● How do we use the symbols "+":or "-" and "=" when we write a number fact? ● How can models (counters, snap cubes, dot cards, ten frames) help us "picture" addition and subtraction facts in our minds? ● How can I recognize and describe the part-whole relationships of numbers up to ten? ● How can I break numbers apart to make ten? ● What are some strategies for learning addition and subtraction combinations to 10 ? ● How can I count on 1 or 2 more from a number to solve addition and subtraction problems within 10?	-Students having difficulty with larger numbers to add and subtract -Students fail to see zero as a number to add and subtract from -Students think that subtraction is commutative. - Students may know the commutative property of addition but fail to apply it to simplify the "work" of addition or misapply it in subtraction situations. -Students have overspecialized their knowledge of addition or subtraction facts and restrict it to "fact tests" or one particular problem format.

● How can I count back 1 or 2 less from a number to solve addition and subtraction problems within 10? ● How can I use doubles to solve addition and subtraction problems within 10? ● How can I use near doubles to solve addition and subtraction problems within 10? ● How can I make ten to solve addition and subtraction problems within 10? ● How can I use "think addition for subtraction"? (9-5 =__, Think 5 and what number makes 9?) ● How can I use related facts to solve addition and subtraction problems within 10? ● How do I know when I use zero it remains the same when solving addition and subtraction problems within 10? (additive identity property) ● How can I use patterns to solve addition and subtraction problems within 10? (0+ 5 =5, 1 + 4 =5, 2 + 3 =5, etc.) ● How can I use efficient strategies for addition and subtraction problems to 10?	
Understanding the Standard	**Essential Knowledge and Skills**
• Computational fluency is the ability to think flexibly in order to choose appropriate strategies to solve problems accurately and efficiently. • Flexibility requires knowledge of more than one approach to solving a particular kind of problem. Being flexible allows students to choose an appropriate strategy for the numbers involved. • Mathematically fluent students are not only able to provide correct answers quickly but also to use facts and computation strategies they know to efficiently determine answers that they do not know. • Composing and decomposing numbers flexibly forms a basis for understanding properties of the operations and later formal algebraic concepts and procedures.	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to** • Recognize and describe with fluency part-whole relationships for numbers up to 10 in a variety of configurations. (a) • Identify + as a symbol for addition, - as a symbol for subtraction, and = as a symbol for equality. (b) • Demonstrate fluency with addition and subtraction within 10. (b)

- Parts of numbers to 10 should be represented in different ways, such as five frames, ten frames, strings of beads, arrangements of tiles or tooth picks, dot cards, or beaded number frames.



- Dot patterns should be presented in both regular and irregular arrangements. This will help students to understand that numbers are made up of parts, and it will later assist them in combining parts as well as counting on.



- Accuracy is the ability to determine a correct answer using knowledge of number facts and other important number relationships.
- Efficiency is the ability to carry out a strategy easily when solving a problem without getting bogged down in too many steps or losing track of the logic of the strategy being used.
- Addition and subtraction should be taught concurrently in order to develop understanding of the inverse relationship.
- Manipulatives should be used to develop an understanding of addition and subtraction facts.
- Automaticity of facts can be achieved through meaningful practice which may include games, hands-on activities, dot cards, and ten frames.
- Subtraction is the inverse of addition. Subtraction can be viewed as a process of taking away or separating, or as a process of comparing two sets to determine the difference between them.

- Provide practice in the use and selection of strategies. Encourage students to develop efficient strategies. Examples of strategies for developing the addition and subtraction facts include:
  - counting on;
  - counting back;
  - "one more than," "two more than"
  - "one less than," "two less than";
  - "doubles" (e.g., 2 + 2 =__; 3 + 3 =__)
  - "near doubles" (e.g., 3 + 4 = (3 + 3) + 1 = __);
  - "make ten" (7 + 4 can be thought of as 7 + 3 + 1 in order to make a ten));
  - "think addition for subtraction" (e.g., for 9 – 5 = __, think "5 and what number makes 9?")
  - use of the commutative property (e.g., 4 + 3 is the same as 3 + 4)
  - use of related facts (e.g., 4 + 3 = 7 , 3 + 4 = 7, 7 – 4 = 3, and 7 – 3 = 4)
  - use of the additive identity property (e.g., 4 + 0 = 4); and
  - use patterns to make sums (e.g., 0 + 5 = 5, 1 + 4 = 5, 2 + 3 = 5, etc.).
- Students at this level are not expected to name the properties.

Vocabulary		Instructional Activities Organized by Learning Objective
addition	plus	**Textbook** **EnVision Math** ● **Lesson 3-4 Introducing Addition Number Sentences pg.63A-66B** ● **Ready Made Centers for Differentiated Instruction: Helping Hands Center Activity 3-4 pg. 7-8** ● **Lesson 306 Adding in Any Order pg. 71A-74B**
sum	subtraction	
minus	difference	
number sentence	equation	
related facts	story problem	
Counting on	counting back	
One more than	one less than	

Two more than	two less than
Doubles	near doubles
Make ten	Symbol: + (add)
Symbol: - (subtract)	part of ten
Part-whole relationship	

Assessment

Powerschool – Exam identifier

- **Ready Made Centers for Differentiated Instruction: Play A Game Center Activity 3-6 pg. 11-12**
- **Lesson 4-4 Introducing Subtraction Number Sentences pg. 95A-98B**
- **Ready Made Centers for Differentiated Instruction: Play A Game Center Activity 4-4 pg. 7-8**
- **Lesson 4-7 Connecting Addition and Subtraction pg. 107A-110B**
- **Ready Made Centers for Differentiated Instruction: Helping Hands Center Activity 4-7 pg. 13-14**

- **Lesson 5-3 Parts of 10 pg. 127A-130B**
- **Lesson 5-4 Finding Missing Parts of 10 pg. 131A-134B**
- **Lesson 6-4 Facts with 5 on a Ten-Frame pg. 155A-158B**
- **Ready Made Centers for Differentiated Instruction: Cover Three Center Activity 6-4 pg.7-8**
- **Lesson 6-2 Doubles pg. 147A-150B**
- **Lesson 7-3 Thinking Addition to 8 to Subtract pg. 179A-182B**

Eureka Math:
1.7a & b

- GRADE 1 MODULE 1:Sums and Differences to 10

Notes

Resources

- **Print**
  - **Teaching Student-Centered Mathematics (K-3 2006)**
    - **Activity 2.16 Build It in Parts pg. 48**
    - **Activity 2.17 Two out of Three pg. 50**

- **Activity 2.18 Covered Parts pg. 50**
- **Activity 2.19 Missing-Part Cards pg. 50**
- **Activity 2.20 I Wish I Had pg. 51**
- **Activity 2.25 Number Sandwiches pg. 53**

- **Interactive Notebooks Math Grade 1**
  - **Addition pg. 24 - 25 (a)**
  - **Subtraction pg. 42 - 43 (a)**
  - **Fact Families pg. 30 - 31 (a)**
  - **Counting On pg. 36 - 37 (a)**
  - **Math Symbols pg. 48 - 49 (b)**
  - **Doubles Facts pg. 32 - 33 (b)**
  - **Missing Addends pg. 34 - 35 (b)**

- **Technology-based**

Math Facts Game
- **http://www.abcya.com/math_facts_game.htm**

Number Bonds To 10
- **https://www.mathplayground.com/number_bonds_10.html**

Minus Mission
- **https://www.mathplayground.com/ASB_MinusMission.html**

Alien Addition
- **https://www.mathplayground.com/ASB_AlienAddition.html**

Station Activities/ Manipulatives

Foam 2-color counters - When given 10 or less **2-color counters**, the student will "pour" the counters from a cup onto their desk to find the sum of the two colors displayed.

	Base 10 magnetic kits and foam base 10s - When shown a number 10 or less using the **base 10 magnetic units and one rod,** the student will use the **foam base 10 units and rod** to determine how many more units would be needed to make a ten. Insect counters, Fruit counters, Pet counters When given a target **number, number cube** and **insect counters, fruit counters, or pet counters**, the student will roll the number cube and count out that amount of counters. They will then determine by counting how many more counters would be needed to reach the target number. Square tiles - When given a target number (up to 10), number cards, **square tiles**, and a five- or ten-frame, the student will choose a number card and place that many square tiles on the five- or ten-frame. The student will then determine how many more tiles will be needed to reach the target number. Attribute blocks: When given up to 10 **attribute blocks** of one shape, the student will use two other shapes to determine two parts of the whole. For example: the student has 6 circle shapes. The student could then put out 2 squares and 4 triangles to show equivalency to the 6 circles.
Cross-Curricular Connections	**Differentiation**

• **Literature Connections**
  ○ **Cats Add Up!**
  ○ **Jack the Builder**
  ○ **Double the Ducks**
  ○ **Animals on Board**	

Richmond Public Schools

Curriculum Framework

Grade 1st

Strand: 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.	
Suggested Pacing	
Related Spiraling Standards	
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.	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 b) use the cent symbol, dollar symbol, and decimal point to write a value of money.
Essential Questions	**Common Misconceptions**
● What is money? What are coins? ● What is the value of a penny? … a nickel? … a dime? ...a quarter? ● How can I count by fives to find the value of a collection of nickels up to 100 cents? ● How can I count by tens to find the value of a collection of dimes up to 100 cents? ● How can I find the value of a collection of pennies by grouping by fives and tens up to 100 cents? ● What strategies help us count a collection of coins?	-Students may have difficulty differentiating differences in coins. -Students may struggle with skip counting. -Students confuse small dime with small value while the penny has the smallest value. -Students do not understand that 100 cents is equivalent to one dollar. -Students add dimes and nickels the same as pennies.
Understanding the Standard	**Essential Knowledge and Skills**
● Many experiences with coins help students develop an understanding of money, such as • drawing pennies to show the value of a given coin (e.g., nickel, dime, or quarter)	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to** ● Count by ones to determine the value of a collection of pennies whose total value is 100 cents or less.

- playing store and purchasing classroom objects, using play money (pennies);
- using skip counting to count a collection of like coins;
- representing the value of coins using a variety of organizers, such as five/ten frames or hundreds charts, pictures; and
- trading the equivalent value of pennies for a nickel, a dime, and a quarter, using play money.

- Counting coins is an application of unitizing.
- Unitizing is the concept that a group of objects can be counted as one unit (e.g., 10 pennies can be counted as 1 dime.)
- Counting money helps students gain an awareness of consumer skills and the use of money in everyday life.
- A variety of classroom experiences in which students manipulate physical models of money and count forward to determine the value of a collection of coins are important activities to develop competence with counting money.
- The last number stated represents the value of a collection of coins being counted.

- Group a collection of pennies by fives and tens as a way to determine the value. The total value of the collection is 100 cents or less.
- Count by fives to determine the value of a collection of nickels whose total value is 100 cents or less.
- Count by tens to determine the value of a collection of dimes whose total value is 100 cents or less.

Vocabulary

penny	one cent
nickel	five cents
dime	ten cents
quarter	twenty-five cents
dollar	one-hundred cents
Money	coins
Value	total value
100 cents	fives
Tens	count

Assessment

Instructional Activities Organized by Learning Objective

Textbook
Envisions (Kindergarten)

- Lesson 13-1 Penny

Eureka Math:
1.8

- GRADE 1 MODULE 6 TOPIC E: Coins and Their Values

Notes

Resources

Powerschool – Exam identifier	• **Print** o **Teaching Student-Centered Mathematics (K-3 2006)** ▪ **Helping Children Work with Money pg. 150** • **Technology-based** o **Money** **Learning Coins** ▪ **http://www.abcya.com/learning_coins.htm** **Money Pics Puzzle** ▪ **https://www.mathplayground.com/puzzle_pics_money.html** **Coins For Candy** ▪ **http://www.roomrecess.com/mobile/CoinsForCandy/play.html** **Counting Money** ▪ **http://www.abcya.com/counting_money.htm** **Station Activities/ Manipulatives** Classroom Money Kit - When given a collection of like coins (pennies, nickels, or dimes) with a value of 100 cents or less from the **Classroom Money Kit**, the student will determine the value of the collection. Classroom Money Kit - When given a collection of pennies with a value of 100 cents or less from the **Classroom Money Kit**, the student will group the pennies by fives and tens to help determine the value of the collection.
Cross-Curricular Connections	**Differentiation**

• **Literature Connections** ○ **The Penny Pot** ○ **Alexander, Who Used to be Rich Last Sunday** ○ **A Quarter From the Tooth Fairy**	

Strand: Measurement and Geometry	
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** **b) read and interpret a calendar.**	
Suggested Pacing	
Related Spiraling Standards	
K.8 The student will investigate the passage of time by reading and interpreting a calendar.	2.9 The student will tell time and write time to the nearest five minutes, using analog and digital clocks. 2.10 The student will a) determine past and future days of the week; and b) identify specific days and dates on a given calendar.
Essential Questions	**Common Misconceptions**
• What tools can be used to measure time?	-Students may confuse the hour and minute hand -Students may have difficulty reading the calendar

● What are minutes? What are hours? How are these shown on an analog clock? … a digital clock? ● How can a digital clock and an analog clock be used to show time to the hour and half-hour? ● Can I match a written time to a digital or analog clock? ● What is a day? What do the letters a.m. and p.m. mean when we tell time? ● Why do we use calendars? ● What units of time are shown on a calendar? ● What words are important when we use a calendar? ● How do patterns help us use a calendar? ● Can I read a calendar to find a day or date? ● Can I tell the day and date before and after any day on a calendar? ● Can I determine the date of any day of the week?	-Students may not understand the pattern in time and in reading a calendar -Students may forget to count by fives when finding the minute. -Students may not understand that the minute hand stands for ":00" and not ":60"
Understanding the Standard	**Essential Knowledge and Skills**
● Many experiences using clocks help students develop an understanding of the telling of time to the hour and half-hour, including: • identifying the parts of an analog clock (minute and hour hands); • demonstrating a given time to the hour and half-hour, using a model clock; • writing digital time to the hour and half-hour; • relating time on the hour and half-hour to daily routines and school schedules (e.g., bedtime, lunch time, recess time); and • connecting the hour and half-hour to fraction concepts. ● Practical situations are appropriate to develop a sense of the interval of time between events (e.g., club meetings occur every week on Monday; there is a week between meetings). ● The calendar is a way to represent units of time (e.g., days, weeks, months).	● Identify different types of clocks (analog and digital) as instruments to measure time. (a) ● Tell time shown on an analog clock to the hour and half-hour. (a) ● Tell time shown on a digital clock to the hour and half-hour. (a) ● Match a written time (e.g., 1:00, 3:30, 11:00) to the time shown on a digital and analog clock to the hour and half-hour. (a) ● Read a calendar to locate a given day or date (e.g., What day of the week is the 10th? What date is Saturday?). (b) ● Determine the day/date before and after a given day/date (e.g., Today is the 30th, so yesterday must have been the __?). (b) ● Given a calendar, determine the number of any day of the week (e.g., How many Fridays are in the month of October?) (b)

- Using a calendar develops the concept of day as a 24-hour period rather than a period of time from sunrise to sunset.

Vocabulary

clock	calendar	Sunday	
time	day	Monday	
digital	date	Tuesday	
analog	today	Wednesday	hour
yesterday	Thursday		
half-hour	tomorrow	Friday	
Saturday	measure time	days of the week	
Match time on 2 clocks		month	
Minute hand	hour hand	24-hour period	

Assessment

Powerschool – Exam identifier

Instructional Activities Organized by Learning Objective

Textbook
EnVision Math

- **Topic 15 Time The Language of Math Pg: 451E451F (a)**
- **Topic 15 Time Interactive Math Story Parade Time Pg: 451G-451H (a)**
- **Topic Opener Time Pg: 451 – 452 (a)**
- **Lesson 15-1 Understanding the Hour and Minute Hands Pg. 453A-456A (a)**
- **Ready Made Centers for Differentiated Instruction: Look and See Center Activity 15-1 Pg. 1-2 (a)**
- **Topic 15: Topic Test Pg.477- 477A (a)**
- **Topic 15: Alternative Assessment Pg.477B477C (a)**
- **Lesson 15-2 Telling and Writing Time to the Hour Pg: 457A – 460A (a)**
- **Ready Made Centers for Differentiated Instruction: Helping Hands Center Activity 16-2 Pg. 3-4 (a)**
- **Telling and Writing Time to the Half Hour Pg: 461A-464A (a)**

	• **Ready Made Centers for Differentiated Instruction: Play a Game Center Activity 15-3 Pg. 5-6 (a)** • **Lesson 15:5 Using the Calendar Pgs. 469-472 B (b)** • **Topic 15: Topic Test Pgs 477-477A (b)** • **Topic 15 Alternate Assessment Pg. 477B (b)** • **Ready Made Centers for Differentiated Instruction: Look and See Center Activity 15:5 Pg. 9 (b)** **Eureka Math:** 1.9a • GRADE 1 MODULE 5 TOPIC D: Application of Halves to Tell Time **Notes** **Resources** • **Print** o **Teaching Student-Centered Mathematics (K-3 2006)** ▪ **Clock Reading pg. 243 - 244 (a)** o **Interactive Notebooks Math Grade 1** ▪ **Time to the Hour pg. 60 - 61 (a)** ▪ **Time to the Half Hour pg. 62 - 53 (a)** • **Technology-based** o **Time** **Telling time** ▪ **http://www.abcya.com/telling_time.htm** **Clock Match**

<table>
<tr><td></td><td>

- **https://www.education.com/game/clock-match/**

Telling Time to Half Hour

- **https://www.iknowit.com/lessons/a-telling-time-half-hour.html**

Clock Shoot

- **http://www.sheppardsoftware.com/mathgames/earlymath/clock_shoot.htm**

Station Activities/ Manipulatives

Write On - Wipe Off Clocks - When shown a time to the hour or half hour on the analog **Write On - Wipe Off Clocks,** the student will tell the time shown on the clock.

Write On - Wipe Off Clocks - When shown a digital time to the hour or half hour on the **Write On - Wipe Off Clocks,** the student will tell the time shown on the clock.
</td></tr>
<tr><th>Cross-Curricular Connections</th><th>Differentiation</th></tr>
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- **Literature Connections**
  - **The Grouchy Ladybug (1.9a)**
  - **It's About Time (1.9a)**
  - **Bats Around the Clock (1.9a)**
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Richmond Public Schools

Curriculum Framework

Grade 1st

Strand: Measurement and Geometry	
1.10 The student will use nonstandard units to measure and compare length, weight, and volume.	
Suggested Pacing	
Related Spiraling Standards	
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).	2.8 The student will estimate and measure a) length to the nearest inch; and b) weight to the nearest pound.
Essential Questions	**Common Misconceptions**
● What does it mean to "measure" something? ● What characteristics (attributes) of an object can be measured? ● What is length? Why are height and distance also measures of length? ● What is volume? ● What is weight (or mass)? ● Why is it important to name the unit of measure we are using? ● How can I estimate and measure the length of an object using nonstandard units? ● How can I compare the length of two objects using the words longer/shorter, taller/shorter, or same as? ● How can I estimate and measure the volume of one container using nonstandard units? ● How can filling containers help us measure and compare their volumes? ● What words are used to compare the volumes of two containers (more, less, equivalent to the other) ?	-Students do not measure starting at edge of nonstandard tool. -Students do not stop where the object ends in measuring length. -Students use wrong notation or labels. -Students choose inappropriate unit of measure or inappropriate measuring tool for task. -Students believe that the size of a picture determines the size of the object in real life.

● How does a balance scale help us compare the weights of two objects? ● How can I estimate and measure the weight/mass of objects using a balance scale with nonstandard units? ● What words are used to compare the weight of two objects (lighter, heavier, equivalent to)?	
Understanding the Standard	**Essential Knowledge and Skills**
● The process of measurement involves selecting a unit of measure, comparing the unit to the object to be measured, counting the number of times the unit is used to measure the object, and arriving at an approximate total number of units. ● Measurement involves comparing an attribute of an object to the same attribute of the unit of measurement (e.g., the length of a cube measures the length of a book; the weight of the cube measures the weight of the book; the volume of the cube measures the volume of a book). ● Premature use of instruments or formulas leaves children without the understanding necessary for solving measurement problems. ● When children's initial explorations of length, weight, and volume involve the use of nonstandard units, they develop some understanding about the need for standard measurement units for length, weight, and volume, especially when they communicate about these measures. ● The level of difficulty in measuring volume can be increased by varying and mixing the sizes and/or shapes of the containers (e.g., using short, wide containers as well as tall, narrow containers). ● Students develop conservation of measurement when they understand that the attributes do not change when the object is manipulated (e.g., a piece of string that is coiled maintains its length as it is straightened; the volume of water does not change when poured from a pitcher into a fish tank.)	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to** ● Measure the length of objects, using various nonstandard units (e.g., connecting cubes, paper clips, erasers). ● Compare the length of two objects, using the terms *longer/shorter, taller/shorter,* or *same as*. ● Measure the weight of objects, using a balance or pan scale with various nonstandard units (e.g., paper clips, bean bags, cubes). ● Identify a balance scale or a pan scale as a tool for measuring weight. ● Compare the weight of two objects, using the terms *lighter, heavier*, or *the same*, using a balance scale. ● Measure the volume of objects, using various nonstandard units (e.g., connecting cubes, blocks, rice, water). ● Compare the volumes of two containers to determine whether the volume of one is *more*, *less*, or *equivalent to* the other, using nonstandard units of measure (e.g., a spoonful or scoopful of rice, sand, jelly beans). ● Compare the volumes of two containers to determine whether the volume of one is *more*, *less*, or *equivalent to* the other by pouring the contents of one container into the other.

- Physically measuring the weights of objects, using a balance scale, helps students develop an intuitive idea of what it means to say something is "lighter," "heavier," or "the same."
- Balance scales are instruments used for comparing weight. A balance scale usually has a beam that is supported in the center. On each side of the beam are two identical trays. When the trays hold equal weights, the beam is level, and the scale is "balanced." The tray containing less weight will rise and the tray containing more weight will fall.
- Experience estimating the weights of two objects (one in each hand) using the terms "lighter," "heavier," or "the same" promotes an understanding of the concept of balance.

Vocabulary

length	taller/shorter	shorter/longer
same as	measure	less
weight	heavier/lighter	same as
volume	more equivalent to	compare
Nonstandard unit	balance scale/pan scale	

Assessment

Powerschool – Exam identifier

Instructional Activities Organized by Learning Objective

Textbook
EnVision Math

- **Topic Opener Measurement Pg. 393-394**
- **Lesson 14-2 Using Units to Estimate and Measure Length pg. 399A-402A**
- **Ready Made Centers for Differentiated Instruction: Try Together Center Activity 14-2 Pg. 3-4**
- **Lesson 14-3 Problem Solving: Use Reasoning Pg. 403A-406B**

Eureka Math:
1.10

- GRADE 1 MODULE 3 : Ordering and Comparing Length Measurements as Numbers

Notes

	Resources ● **Print** o **Teaching Student-Centered Mathematics (K-3 2006)** ▪ **Figure 8.1 Measuring different attributes of a bucket pg. 224** ▪ **Table 8.1 Plan for Measurement Instruction pg. 225** ▪ **Activity 8.1 Longer, Shorter, Same pg. 228** ▪ **Activity 8.2 Length (or Unit) Hunt pg. 229** ▪ **Activity 8.3 Crooked Paths pg. 229** ▪ **Using Units of Length pg. 229-230** ▪ **Activity 8.4 How Long Is the Teacher pg. 230** ▪ **Activity 8.5 Guess and Measure pg. 231** ▪ **Activity 8.6 Changing Units pg. 231** o **Interactive Notebooks Math Grade 1** ▪ **Measuring with Nonstandard Units pg. 58 - 59** ▪ **Ordering Objects by Length pg. 56 - 57** ● **Technology-based** o **Capacity More or Less** o **Taller or Shorter** o **Length Strength - Non Standard** **Station Activities/ Manipulatives** School Pan Balance or School Rocker Scales: When given a **school pan balance** or **school rocker scales**, students will use various objects (e.g., paper clips, bean bags, cubes) to weigh other objects.
Cross-Curricular Connections	**Differentiation**

• **Literature Connections**
  ○ **Inch by Inch**
  ○ **How Short, How Tall, How Far Away?**
  ○ **Measuring Penny**
  ○ **Who Sank the Boat?**	

Richmond Public Schools

Curriculum Framework

Grade 1st

Strand: Measurement and Geometry	
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** **b) identify and describe representations of circles, squares, rectangles, and triangles in different environments, regardless of orientation, and explain reasoning.**	
Suggested Pacing	
Related Spiraling Standards	
K.10 The student will a) identify and describe plane figures (circle, triangle, square, and rectangle); b) compare the size (smaller, larger) and shape of plane figures (circle, triangle, square, and rectangle); and 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.	2.13 The student will identify, describe, compare, and contrast plane and solid figures (circles/spheres, squares/cubes, and rectangles/rectangular prisms).
Essential Questions	**Common Misconceptions**
● How can we recognize a triangle? … a square? … a rectangle? … a circle? ● What words help us describe geometric shapes? (number of sides, vertices, angles, curved, right angles, etc). ● How do the characteristics of shapes help us sort them? ● How can we recognize and describe the geometric shapes which are parts of pictures and models? ● How can we recognize and describe geometric shapes in the world around us regardless of orientation?	-Students may confuse shapes. -Students confuse sides with vertices and angles (or vice versa) -Students may have difficulty making connections with the shapes around our world.

● Can I use tracing to construct a triangle? … a square? … a rectangle? … a circle? ● How can I justify why an object is a circle, square, triangle, or rectangle?	
Understanding the Standard	**Essential Knowledge and Skills**
● Early experiences with comparing, sorting, and subdividing figures assist students in analyzing the characteristics of plane figures. ● A plane figure is any closed, two-dimensional shape. ● A vertex is the point at which two or more lines, line segments, or rays meet to form an angle. The term *vertices* is the plural form of vertex. ● An angle is formed by two rays that share a common endpoint called the vertex. Angles are found wherever lines or line segments intersect. ● A polygon is a closed plane figure composed of at least three line segments that do not cross. ● A triangle is a polygon with three sides. ● A quadrilateral is a polygon with four sides. ● A rectangle is a quadrilateral with four right angles. ● A square is a quadrilateral with four congruent (equal length) sides and four right angles. At this level, students might describe a square as a special rectangle with four sides of equal length. ● Students at this level do not need to use the terms *polygon*, *quadrilateral*, or *congruent*. ● A right angle measures exactly 90 degrees. ● A circle is the set of points in a plane that are the same distance from a point called the center. A circle is not a polygon, because it does not have straight sides. ● Presentation of triangles, rectangles, and squares should be made in a variety of spatial orientations so that students do not develop the common misconception that triangles, rectangles, and squares must have one side parallel to the bottom of the page on which they are printed.	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to** ● Identify the name of the plane figure when given information about the number of sides, vertices, and angles. (a) ● Trace triangles, squares, rectangles, and circles. (a) ● Describe a circle using terms such as *round* and *curved*. (a) ● Describe triangles, squares, and rectangles by the number of sides, vertices, and angles. (a) ● Recognize that rectangles and squares have special types of angles called right angles. (a) ● Sort plane figures based on their characteristics (number of sides, vertices, angles, curved, etc.). (a) ● Identify and describe representations of circles, squares, rectangles, and triangles, regardless of orientation, in different environments and explain reasoning. (b)

- Representations of circles, squares, rectangles, and triangles can be found in the students' environment at school and at home. Students should have opportunities to identify/classify things in the environment by the type of figure those things represent.
- A common misconception students have when a figure such as a square is rotated is that they will frequently refer to the rotated square as a diamond. Clarification needs to be ongoing (e.g., a square is a square regardless of its location in space; there is no plane figure called a diamond).
- Building geometric and spatial capabilities fosters enthusiasm for mathematics while providing a context to develop spatial sense.
- Polygons can be constructed using other polygons (e.g., six equilateral triangles can be used to construct a hexagon; a triangle can be added to a rectangle to create a pentagon, etc.).
- Early experiences with comparing, sorting, and subdividing figures or manipulatives (e.g., pattern blocks) assist students in analyzing the characteristics of plane geometric figures.

Vocabulary

plane figures	circle
triangle	square
rectangle	sides
vertices	vertex
angle	right angle
Round	curved
Center	degrees

Assessment

Powerschool – Exam identifier

Instructional Activities Organized by Learning Objective

Textbook
EnVision Math

- **Topic 8: Language of Math – Pg. 193E**
- **Topic 8 – Pgs. 193G-194**
- **Ready Made Centers for Differentiated Instruction: Cover Three Center Activity 8:1 Pgs. 1-2**
- **Lesson 8:2 Properties of Plane Shapes Pgs. 199A202A**
- **Ready Made Centers for Differentiated Instruction: Play a Game Center Activity 8:2 Pgs. 3-4**

- **Ready Made Centers for Differentiated Instruction: Cover Three Center Activity 8:6 Pgs. 11-12**
- **Lesson 8-10: Flat Surfaces and Corners – Pgs. 231A234**
- **Lesson 8:1 Identifying Plane Shapes Pgs. 195A-198A**

Eureka Math:
1.11
- GRADE 1 MODULE 5 TOPIC A: Attributes of Shapes

Notes

Resources
- **Print**
  - **Teaching Student-Centered Mathematics (K-3 2006)**
    - **Activity 7.1 pg. 194 Shape Sorts**
    - **Activity 7.2 pg. 195 What's My Shape**
    - **Activity 7.3 pg. 197 Geoboard Copy**
- **Technology-based**

Magical Shape Hunt
- **http://pbskids.org/peg/games/magical-shape-hunt**

Geometry Shape Game
- **http://www.abcya.com/shapes_geometry_game.htm**

Shape Match
- **http://www.abcya.com/shape_match.htm**

Station Activities/ Manipulatives

	Attribute Blocks: When given a set of **attribute blocks**, the student will identify and sort them according to the number of sides, vertices, or angles. Attribute Blocks: When given a set of **attribute blocks**, the student will identify and trace the plane figures according to the number of sides, vertices, or angles. Attribute Blocks: When given a set of **attribute blocks**, the students will identify and describe each plane figure according to the number of sides, vertices, or angles. Attribute Blocks: When given a set of **attribute blocks** and a picture or object from the student's environment, such as a clock, the student will use the **attribute blocks** to identify the plane figure and explain their reasoning.
Cross-Curricular Connections	Differentiation

• **Literature Resources**
  ○ **The Shape of Things**
  ○ **The Greedy Triangle**
  ○ **Circus Shapes**
  ○ **Mouse Shapes**	

Richmond Public Schools

Curriculum Framework

Grade 1st

Strand: 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** **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*.**	
Suggested Pacing	
Related Spiraling Standards	
K.11 The student will **a) collect, organize, and represent data; and** **b) read and interpret data in object graphs, picture graphs, and tables.**	2.14 The student will use data from probability experiments to predict outcomes when the experiment is repeated. 2.15 The student will a) collect, organize, and represent data in pictographs and bar graphs; and b) read and interpret data represented in pictographs and bar graphs.
Essential Questions	**Common Misconceptions**
● What is data? ● What data is useful for us to collect? ● What are some ways to gather and record information (data) (to include counting, tallying marks, informal surveys, observations, and voting)? ● How do tables, picture graphs, and object graphs help us display and make sense of data? ● How do we "read" a picture graph? What kinds of information does it show? ● How do we "read" an object graph? What kinds of information does it show? ● How can we use a picture graph or object graph to compare different categories of information?	-Students confuse the two axes of a graph. -Students do not understand the meaning of points in the same position relative to one of the axes. -Students think that the points on the graph stay in the same position even if the axes change. -Students think that graphs are "pictures" of situations, rather than abstract representations. - Students think that graphs always go through (or begin at) the origin. -Students think that graphs always cross both axes. -Students focus on some attributes of a situation and ignore others. -Students think that the greatest numbers labeled on the axes represent the greatest values reached

● What words do we use when we interpret picture graphs and object graphs (more, less, fewer, greater than, less than, and equal to)? ● Can I answer "How many more?" and "How many fewer?", "How many greater than/less than?", and "How many equal to?" questions when reading tables, object graphs, and picture graphs?	
Understanding the Standard	**Essential Knowledge and Skills**
● Data are pieces of information collected about people or things. The primary purpose of collecting data is to answer questions. The primary purpose of interpreting data is to inform decisions (e.g., which type of clothing to pack for a vacation based on a weather graph or which type of lunch to serve based upon class favorites). ● After generating questions, students decide what information is needed and how it can be collected. ● The collection of the data often leads to new questions to be investigated. ● Data collection could involve voting, informal surveys, tallying, and charts (e.g., recording daily temperature, lunch count, attendance, favorite ice cream). ● Surveys, which are data-collecting tools that list choices, should have a limited number of questions at the primary grades. ● Tallying is a method for gathering information. Tally marks are used to show how often something happens or occurs. Each tally mark represents one occurrence. Tally marks are clustered into groups of five, with four vertical marks representing the first four occurrences and the fifth mark crossing the first four on a diagonal to represent the fifth occurrence. ● Picture graphs are graphs that use pictures to represent and compare information. At this level, each picture should represent one data point. ● Object graphs are graphs that use concrete materials to represent and compare the categorical data that are collected (e.g., cubes stacked by the month, with one cube representing the birthday month of each student).	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to** ● Collect and organize data using various forms of data collection (e.g., counting and tallying, informal surveys, observations, voting). Data points, collected by students, should be limited to 16 or fewer for no more than four categories. (a) ● Represent data in tables, picture graphs, and object graphs. (a) ● Analyze information displayed in tables, picture graphs, and object graphs (horizontally or vertically represented): ○ Read the graph to determine the categories of data and the data as a whole (e.g., the total number of responses) and its parts (e.g., 15 people are wearing sneakers); and ○ Interpret the data that represents numerical relationships, to include using the words *more, less, fewer, greater than, less than,* and *equal to*. (b)

- Tables are an orderly arrangement of data in columns and rows in an essentially rectangular format. Tables may be used to display some type of numerical relationship or organized lists.
- At this level, data gathered and displayed by students should be limited to 16 or fewer data points for no more than 4 categories.
- Students should have opportunities to interpret graphs, created with the assistance of the teacher, that contain data points where their entire class is represented (e.g., tables that show who brought their lunch and who will buy their lunch for any given day, picture graph showing how students traveled to school – bus, car, walk).

Vocabulary

data	table
picture graphs	object graphs
more	less
fewer	greater than
less than	equal to
data points	counting
tallying	survey
observation	voting
categories	

Assessment

Powerschool – Exam identifier

Instructional Activities Organized by Learning Objective

Textbook
EnVision Math

- **Lesson 18-1 Using Data from Real Graphs Pgs. 541A-544A**
- **Lesson 18-5 Collecting Data Using Tally Marks Pgs. 537A-560A**
- **Ready Made Centers for Differentiated Instruction: Look and See Activity 18-5 Pgs. 9-10**
- **Lesson 18-6 Making Real Graphs Pgs. 561A-564A**
- **Ready Made Centers for Differentiated Instruction: Helping Hands Activity 18-6 Pgs. 11-12**
- **Making Picture Graphs Pgs. 565A-568A**
- **Ready Made Centers for Differentiated Instruction: Helping Hands Activity 18-7 Pgs. 13-14**

- **Lesson 18-8 Problems Solving: Make a Graph Pgs. 569A-572A**

Eureka Math:
1.12 a & b

- GRADE 1 MODULE 3 TOPIC D: Data Interpretation

Notes

Resources

- **Print**
  - **Teaching Student-Centered Mathematics (K-3 2006)**
    - **Gathering Data to Answer Questions pg. 310 - 312**
    - **Bar Graphs pg. 319 - 321**
    - **Expanded Lesson: Using Data to Answer Our Questions pg. 329 -330**
  - **Interactive Notebooks Math Grade 1**
    - **Graphs and Data pg. 64 - 65 (a) (b)**
- **Technology-based**

Graphing

Bar Graphs

- **https://www.mathplayground.com/video_bar_graphs.html**

Picture Graphs

- **https://www.mathplayground.com/video_picture_graphs.html**

Fuzz Bugs Graphing

- **http://www.abcya.com/fuzz_bugs_graphing.htm**

	Station Activities/ Manipulatives Insect Counters, Fruit Counters, Pet Counters - When given various numbers of **insect counters**, **fruit counters**, and/or **pet counters**, the students will create an object graph and then interpret the graph using the vocabulary *more, less, fewer, greater than, less than,* and *equal to*. Graphing Mats: When given a **graphing mat** and data from class surveys or experiments, students will organize data into a picture graph and then interpret the graph using the vocabulary *more, less, fewer, greater than, less than,* and *equal to*.
Cross-Curricular Connections	Differentiation

• **Literature Connections**
  ○ **Tally O'Malley**
  ○ **Lemonade For Sale**	

Richmond Public Schools

Curriculum Framework

Grade 1st

Strand: Patterns, Functions, and Algebra	
1.13 The student will sort and classify concrete objects according to one or two attributes.	
Suggested Pacing	
Related Spiraling Standards	
K.12 The student will sort and classify objects according to one attribute.	
Essential Questions	**Common Misconceptions**
● What attributes might be used to sort objects (color, shape, size, thickness)? ● How can we sort the same set of objects in different ways? ● Can I describe how I grouped objects (color, shape, size, thickness)?	-Students focuses on just one attribute verses more. -Students have trouble finding the sorting rule. -Misunderstanding of vocabulary
Understanding the Standard	**Essential Knowledge and Skills**
● Sorting, classifying, and ordering objects facilitates work with patterns, geometric shapes, and data. ● The same set of objects can be sorted and classified in different ways. ● To classify is to arrange or organize a set of materials according to a category or attribute (a quality or characteristic). ● A Venn diagram can be a helpful tool when sorting by more than one attribute. ● One way to explore attributes is to investigate non-examples (e.g., a triangle could be a non-example in a sort of rectangles and circles). ● General similarities and differences among items are easily observed by primary students, who can begin to focus on more than one attribute at a time. During the primary grades, the	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to** ● Sort and classify concrete objects into appropriate subsets (categories) based on one or two attributes, such as size, shape, color, and/or thickness (e.g., sort a set of objects that are both red and thick). ● Label attributes of a set of objects that has been sorted. ● Name multiple ways to sort a set of objects.

teacher's task is to move students toward a more sophisticated understanding of classification in which two or more attributes connect or differentiate sets, such as those found in nature (e.g., leaves with different colors and different shapes).

Vocabulary

sort	classify
attribute	size
shape	color
thickness	order
Venn diagram	example/non-example
Similarities	differences

Assessment

Powerschool – Exam identifier

Instructional Activities Organized by Learning Objective

Textbook
EnVision Math

- Lesson 8-2: Properties of Plane Shapes
- Lesson VA - 1 Sorting Objects
- Lesson VA - 2 Sorting by More than One Attribute

Eureka Math:
1.13

- GRADE K MODULE 2: Two-Dimensional and Three-Dimensional Shapes
- GRADE K MODULE 6: Analyzing, Comparing, and Composing SHapes
- GRADE 1 MODULE 3 TOPIC A: Indirect Comparison in Length Measurement
- GRADE 1 MODULE 3 LESSON 6: Order, measure, and compare the length of objects before and after measuring with centimeter cubes, solving compare with difference unknown word problems.

Notes

Resources

- **Print**
  - **Teaching Student-Centered Mathematics (K-3 2006)**
    - Activity 7.1 pg. 194 Shape Sorts
    - Activity 11.1 pg. 314 The First Loops

<table>
<tr><td></td><td>
● Activity 11.2 pg. 315 Guess My Rule
● Activity 11.3 pg. 316 Hidden Labels

● Technology-based
Sort It Out
o https://www.scholastic.com/clifford/play/sortitout/sortitout.htm

Station Activities/ Manipulatives

Attribute Blocks - When given a set of attribute blocks, the student will sort them according to one or two attributes. For example, sort all of the blue, thick blocks.

Attribute Blocks - When given a set of attribute blocks, the student will sort them and then verbally classify the attributes they were sorted by.
</td></tr>
<tr><th>Cross-Curricular Connections</th><th>Differentiation</th></tr>
<tr><td>
● Literature Connections
○ 3 Little Firefighters
○ The Button Box
</td><td></td></tr>
</table>

Richmond Public Schools

Curriculum Framework

Grade 1st

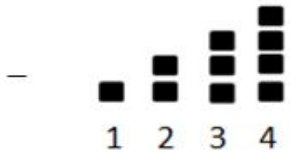
Strand: Patterns, Functions, and Algebra	
1.14 The student will identify, describe, extend, create, and transfer growing and repeating patterns.	
Suggested Pacing	
Related Spiraling Standards	
K.13 The student will identify, describe, extend, create, and transfer repeating patterns.	**2.16** The student will identify, describe, create, extend, and transfer patterns found in objects, pictures, and numbers.
Essential Questions	**Common Misconceptions**
● What is a pattern? ● How can we recognize a repeating pattern? … a growing pattern (rhythmic, color, geometric figure, or numerical sequences)? ● Can I describe a repeating and growing pattern in a given rhythmic, color, geometric figure, or numerical sequence? ● What are some ways we can create patterns? ● What patterns can be found in our environment? ● How can we create number patterns on a calculator? ● How does finding and describing the repeated part (or core) of a pattern help us extend it? ● Can I extend a repeating or growing pattern, using manipulatives, geometric figures, numbers, or calculators? ● Can I transfer a pattern from one form to another? (ie 1,2,3,4...has the same structure as 10, 11, 12, 13)	-Unable to extend pattern -determining the core -Misunderstanding with transferring or creating a new pattern -lack of prior knowledge
Understanding the Standard	**Essential Knowledge and Skills**
● Opportunities to identify, describe, extend, create, and transfer patterns are essential to the primary school experience and lay the foundation for thinking algebraically. ● Patterning should include:	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to** ● Identify the pattern in a given rhythmic, color, geometric figure, or numerical sequence.

○ creating a given pattern, using objects, sounds, movements and pictures; ○ recording a pattern with pictures or symbols; ○ transferring a pattern into a different form or different representation (e.g., blue–blue–red–green to an AABC repeating pattern); and ○ analyzing patterns in practical situations (e.g., calendar, seasons, days of the week). ● In a repeating pattern the part of the pattern that repeats is the core. ● At this level students should have experiences extending patterns when given a complete repetition of a core (e.g., ABACABACABAC) as well as when the final repetition of the core is incomplete (e.g., AABBAABBAA …; Red, Blue, Green, Red, Blue, Green, Red, Blue....). ● Examples of repeating patterns include: ○ AABCAABC; ○ ABACABAC; ○ ABBCABBC; ○ AABCAABC; and ○ ABACDABACD. ● Growing patterns involve a progression from step to step which make them more difficult for students than repeating patterns. Students must determine what comes next and also begin the process of generalization, which leads to the foundation of algebraic reasoning. Students need experiences identifying what changes and what stays the same in a growing pattern. Growing patterns may be represented in various ways, including dot patterns, staircases, pictures, etc. ● Examples of growing patterns include:	● Describe the pattern in a given rhythmic, color, geometric figure, or numerical sequence in terms of the core (the part of the sequence that repeats). ● Extend a repeating or growing pattern, using manipulatives, geometric figures, numbers, or calculators. ● Create a repeating or growing pattern, using manipulatives, geometric figures, numbers, or calculators (e.g., the growing patterns 2, 3, 2, 4, 2, 5, 2, 6, 2, ...). ● Transfer a pattern from one form to another.

Richmond Public Schools

Curriculum Framework

Grade 1st



– 5, 10, 15, 20...

- Transferring a pattern is creating the pattern in a different form or representation.
- Examples of pattern transfers include:
  - 1, 2, 3, 4... has the same structure as 10, 11, 12, 13…;
  - ABABAB… has the same structure as red, blue, red, blue, red, blue; and
  - Snap, clap, jump, clap, snap, clap, jump, clap has the same structure as ABCBABCB.

Vocabulary	
repeating pattern	growing pattern
identify	describe
extend	create
Transfer	pattern
Rhythmic pattern	color pattern
Geometric pattern	numerical sequence

Instructional Activities Organized by Learning Objective

Textbook
EnVision Math:

- **Lesson 9:3 Extending Shape Patterns Pgs. 251A-254A**

Notes

Resources

- **Print**
  - **Teaching Student-Centered Mathematics (K-3 2006)**
    - **Activity 10.1 pg. 276 Pattern Strips**
    - **Activity 10.2 pg. 277 Pattern Match**

Richmond Public Schools

Curriculum Framework

Grade 1st

<table>
<tr><th>Assessment</th><td>

▪ **Activity 10.4 pg. 279 Predict Down the Line**

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Powerschool – Exam identifier

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- **Technology-based**

Fuzz Bugs Patterns

o **http://www.abcya.com/fuzz_bugs_patterns.htm**

Patterns

o **http://www.abcya.com/patterns.htm**

Shape Patterns

o **http://www.abcya.com/shape_patterns.htm**

Station Activities/ Manipulatives

Pattern Blocks: When given a pattern using **pattern blocks**, the student will identify, describe, and extend the pattern.

Pattern Blocks: When given **pattern blocks**, the student will create a growing or repeating pattern.

Pattern Blocks: When given a growing or repeating pattern using objects, pictures, letters, or numbers, the student will transfer the pattern into one using **pattern blocks.**

</td></tr>
<tr><th>Cross-Curricular Connections</th><th>Differentiation</th></tr>
<tr><td>

- **Literature Connections**
  - **Caps for Sale**
  - **Beep, Beep, Vroom, Vroom**

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</table>

Richmond Public Schools

Curriculum Framework

Grade 1st

Strand: Patterns, Functions, and Algebra	
1.15 The student will demonstrate an understanding of equality through the use of the equal symbol.	
Suggested Pacing	
Related Spiraling Standards	
	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.
Essential Questions	**Common Misconceptions**
● When do we use the equal sign (=)? ● How does an equal sign "balance" each side of a number sentence (equation)? ● Can I explain what it means to be equal? ● Can I explain that the = symbol means "is the same as" or "another name for" or "equal in value"? ● How can we test whether a number sentence is true? ● How can we test whether a number sentence is not equal? ● How can we use models and number sentences to show that some combinations (facts) have equivalent values?	-Students believe equal symbol to only be used to find the sum and difference of an equation -Students have difficulty seeing how one equation can be equal to another equation using different parts. (ex 2+2=1+3) -Misunderstanding of vocabulary. -Misuse of language
Understanding the Standard	**Essential Knowledge and Skills**
● At this level, students should represent equality using objects, words, and symbols through the use of the equal symbol while	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to** ● Describe the concept of equality.

inequality should be communicated primarily through words such as *not equal*, *not equivalent*, etc.

- Equality can be shown using a balance scale or a number balance. An equation, such as 3 + 5 = 6 + 2, can be represented using a balance scale, with equal amounts on each side.
- An equation (number sentence) is a mathematical statement representing two expressions that are equivalent. It consists of two expressions, one on each side of an *equal* symbol (e.g., 5 + 3 = 8, 8 = 5 + 3 and 4 + 3 = 9 −2).
- A common misunderstanding is that the equal symbol always means "the answer comes next." The equal symbol represents a balance between expressions. The equal symbol means "is the same as" or "another name for" or "equal in value."
- Inequalities such as 5 < 4 + 3 are not equations. Equations must have the equal symbol (e.g., 5 + 6 = 11).
- Equations should be routinely modeled in conjunction with story problems. Manipulatives such as connecting cubes and counters can be used to model equations.
- An expression is a representation of a quantity. It contains numbers, variables, and/or computational operation symbols. It does not have an equal symbol (e.g., 5, 4 + 3, 8 − 2).
- Students at this level are not expected to use the term *expression*.
- Solving missing addend problems and stories helps with the understanding of equality and use of the equal symbol (e.g., There are four red birds in the tree. Some black birds fly to the tree. Now there are six birds in the tree. How many black birds flew to the tree? 4 +__ = 6)

- Identify equivalent values and represent equalities through the use of objects, words, and the equal (=) symbol.
- Identify and describe expressions that are not equal (e.g., 4 + 3 is not equal to 3 + 5).
- Recognize that equations can be used to represent the relationship between two expressions of equal value (e.g., 4 + 2 = 2 + 4 and 6 + 1= 4 + 3).
- Model an equation that represents the relationship of two expressions of equal value.

Vocabulary		**Instructional Activities Organized by Learning Objective**
equality	equal	**Textbook** **Envision Math** ● VA Practice pg. 8
Symbol: = (equal)	equivalent values	
same as	identify	
Describe	equation	
Not equal	not equivalent	

inequality* expression*
(*NOTE:students should apply rules but not required to use the terms)

Assessment

Powerschool – Exam identifier

Eureka Math:
1.15

- GRADE 1 MODULE 1 TOPIC E:The Commutative Property of Addition and the Equal Sign
- GRADE 1 MODULE 2 LESSON 25:Strategize and apply understanding of the equal sign to solve equivalent expressions

Notes

Resources

- **Print**
  - **Teaching Student-Centered Mathematics (K-3 2006)**
    - **Activity 10.21 Names for Numbers pg. 300**
    - **Activity 10.22 Tilt or Balance pg. 300**
  - **Interactive Notebooks Math Grade 1**
    - **Math Symbols pg. 48 - 49**
    -
  - **VDOE Resources**
    Balancing Act
    http://www.doe.virginia.gov/testing/solsearch/sol/math/1/mess_1-18.pdf

- **Technology-based**
  Addition Balance
  - **http://www.softschools.com/math/addition/balance_equations/**

  Bunny Balance
  - **http://www.peepandthebigwideworld.com/en/kids/games/2/bunny-balance/**

	Number Balance o **http://www.crickweb.co.uk/ks1numeracy.html#100square** **Station Activities/ Manipulatives** School Pan Balance or School Rocker Scales Unifix Cubes: When given a **school pan balance** or **school rocker scale** and color tiles, students will demonstrate equality by putting a combination of two colors on one side and a combination of two colors on the other side to see if they balance.
Cross-Curricular Connections	**Differentiation**
● **Literature Connections** ○ **Equal Schmequal**	