

Unit Overview	
<b>Content Area:</b> Basic Skills – Math	
<b>Unit Title:</b> Counting and Cardinality	
<b>Grade Level:</b> Kindergarten – Fifth Grade	
<b>Unit Summary:</b> <p>In this unit, students practice counting to 100, matching the number of objects with the number name, telling which group has more, and using ordinal numbers to show where.</p> <p>Students move through this unit based on their needs identified in MAP testing and diagnostic assessments. They do not complete each lesson.</p>	
Learning Targets	
<b>Common Core Standards:</b> <ul style="list-style-type: none"> <li>• K.CC.A.1 Count to 100 by ones and by tens.</li> <li>• K.CC.A.2 Count forward beginning from a given number within the know sequence (instead of having to begin at 1).</li> <li>• K.CC.A.3 Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).</li> <li>• K.CC.B.4a When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.</li> <li>• K.CC.B.4b Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.</li> <li>• K.CC.B.4c Understand that each successive number name refers to a quantity that is one larger.</li> <li>• K.CC.B.5 Count to answer “how many?” questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1-20, count out that many objects.</li> <li>• K.CC.C.6 Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.</li> <li>• K.CC.C.7 Compare two numbers between 1 and 10 presented as written numerals.</li> </ul>	
<b>Unit Essential Questions:</b> <ul style="list-style-type: none"> <li>• What are the number names?</li> <li>• What is the correct sequence of numbers?</li> <li>• How many objects are in a set of objects?</li> <li>• Which group of objects has more?</li> </ul>	<b>Unit Enduring Understandings:</b> <ul style="list-style-type: none"> <li>• Written numerals represent quantities.</li> </ul>
<b>Unit Learning Targets:</b> <i>Students will...</i> <ul style="list-style-type: none"> <li>• Make, count and write numbers to 20.</li> <li>• Compare groups of objects, identifying which has more.</li> <li>• Count by 1s and 10s to 100, counting on when the starting number is not 1.</li> <li>• Use ordinal numbers to identify the place of different objects.</li> </ul>	
Evidence of Learning	
<b>Assessments:</b> <ul style="list-style-type: none"> <li>• Completed assignments</li> </ul>	

- Progress monitoring of skills
- Observation

#### Lesson Plans

Lesson Number and Title	Lesson Description
A1 – Zero to Five	Students write the numbers 1 to 5 on separate sheets of construction paper then glue that number of objects to the paper. Complete A1.
A2 – More and Fewer	Students look at two groups of objects and match them on a one-to-one basis. Students determine which group has more. Complete A2.
A3 – Six to Ten	Students write the numbers 6 to 10 on separate sheets of construction paper then glue that number of objects to the paper. Complete A3.
A4 – Comparing Numbers	Students look at two groups of objects and match them on a one-to-one basis. Students record the number of objects in each group and circle which is more. Complete A4.
A5 – Eleven to Nineteen	Students use counters to fill grids and make the numbers from 11 to 19. Students write the number next to each group. Complete A5.
A7 – Counting by 10s to 100	Students count out loud by 10s to 100, realizing that they are changing the first digit (tens place) with each successive number. Students look at pictures arranged in groups of tens and determine the correct number of objects. Complete A7.
A8 – Counting to 100	Using a hundreds chart, students count by ones to 100. Students practice counting on given any number from 1 to 100 as the starting point. Students count by tens and then add on (e.g., 10, 20, 30, 40, 50, 51, 52 for 52). Complete A8.
A9 – Numbers to 12	Students place counters on a ten frame grid, saying the number as each new counter is added. When grid is filled, students add 2 more counters to realize that twelve is ten and two more. Complete A9.
A10 – Spatial Patterns for Numbers to 10	Students arrange a given number of counters in different ways and record it. Students write the numbers. Complete A10.
A22 – Ordinal Numbers Through Tenth	Students stand in a line and identify in which they are standing. Students arrange objects in a line and locate the object in second, sixth, etc. Complete A22.
A23 – Ordinal Numbers	Students review ordinal numbers up to twentieth. Students identify the object in an ordinal place, or give the ordinal place for an object. Complete A23.
A29 – Number Words to Twenty	Students use counters to make and say a number. Students match the number with the word. Complete A29.

#### Resources

**Student Resources:**

- Construction paper, lined paper
- Objects for sorting and gluing (buttons, beads, macaroni noodles, etc.)
- Counters and ten frames

**Teacher Resources:**

- Math Diagnosis and Intervention System (Pearson Education, Inc.)

Unit Overview
<p><b>Content Area:</b> Basic Skills – Math</p>
<p><b>Unit Title:</b> Operations and Algebraic Thinking</p>
<p><b>Grade Level:</b> Kindergarten to Fifth Grade</p>
<p><b>Unit Summary:</b> In this unit, students gain fluency with their basic addition, subtraction, multiplication, and division facts. They become familiar with and use the properties (commutative, distributive, etc.). They solve equations with missing pieces. Students move through this unit based on their needs identified in MAP testing and diagnostic assessments. They do not complete each lesson.</p>
Learning Targets
<p><b>Common Core Standards:</b></p> <ul style="list-style-type: none"> <li>• K.OA.A.1 Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g. claps), acting out situations, verbal explanations, expressions, or equations.</li> <li>• K.OA.A.2 Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.</li> <li>• K.OA.A.3 Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., <math>5=2+3</math> and <math>5=4+1</math>).</li> <li>• K.OA.A.4 For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.</li> <li>• K.OA.A.5 Fluently add and subtract within 5.</li> <li>• 1.OA.A.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for unknown number to represent the problem.</li> <li>• 1.OA.A.2 Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.</li> <li>• 1.OA.B.3 Apply properties of operations as strategies to add and subtract. Examples: If <math>8+3=11</math> is known, then <math>3+8=11</math> is also known. To add <math>2+6+4</math>, the second two numbers can be added to make a ten, so <math>2+6+4=2+10=12</math>.</li> <li>• 1.OA.B.4 Understand subtraction as an unknown-addend problem. For example, subtract <math>10-8</math> by finding the number that makes 10 when added to 8.</li> <li>• 1.OA.C.5 Related counting to addition and subtraction (e.g., by counting on 2 to add 2).</li> <li>• 1.OA.C.6 Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., <math>8+6=8+2+4=10+4=14</math>); decomposing a number leading to a ten (e.g., <math>13-4=13-3-1=10-1=9</math>); using the relationship between addition and subtraction (e.g., knowing that <math>8+4=12</math>, one knows <math>12-8=4</math>); and creating equivalent but easier or known sums (e.g., adding <math>6+7</math> by creating the known equivalent <math>6+6+1=12+1=13</math>).</li> <li>• 1.OA.D.7 Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. For example, which of the following equations are true and which are false? <math>6=6</math>, <math>7=8-1</math>, <math>5+2=2+5</math>, <math>4+1=5+2</math>.</li> <li>• 1.OA.D.8 Determine the unknown whole number in an addition or subtraction equation relating</li> </ul>

three whole numbers. For example, determine the unknown whole number in an addition or subtraction equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations  $8+?=11$ ;  $5=?-3$ ,  $6+6=?$ .

- 2.OA.A.1 Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
- 2.OA.B.2 Fluently add and subtract with 20 using mental strategies. By end of Grade 2, know from memory all sum of two one-digit numbers.
- 2.OA.C.3 Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an odd number as a sum of two equal addends.
- 2.OA.C.4 Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.
- 3.OA.A.1 Interpret products of whole numbers, e.g., interpret  $5*7$  as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as  $5*7$ .
- 3.OA.A.2 Interpret whole-number quotients of whole numbers, e.g., interpret  $56 / 8$  as the number of objects in each share when 56 objects are portioned equally into shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as  $56 / 8$ .
- 3.OA.A.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
- 3.OA.A.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations  $8*?=48$ ,  $5=? / 3$ ,  $6*6=?$ .
- 3.OA.B.5 Apply properties of operations as strategies to multiply and divide. Examples: If  $6*4=24$  is known, then  $4*6=24$  is also known.  $3*5*2$  can be found by  $3*5=15$ , then  $15*2=30$ , or by  $5*2=10$ , then  $3*10=30$ . Knowing that  $8*5=40$  and  $8*2=16$ , one can find  $8*7$  as  $8*(5+2)=(8*5)+(8*2)=40+16=56$ .
- 3.OA.B.6 Understand division as an unknown-factor problem. For example, find  $32 / 8$  by finding the number that makes 32 when multiplied by 8.
- 3.OA.C.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that  $8*5=40$ , one knows  $40 / 5 =8$ ) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.
- 3.OA.D.8 Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.
- 3.OA.D.9 Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.
- 4.OA.A.1 Interpret a multiplication equation as a comparison, e.g., interpret  $35=5*7$  as a

statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplication comparisons as multiplication equations.

- 4.OA.A.2 Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.
- 4.OA.A.3 Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.
- 4.OA.B.4 Find all factor pairs for a whole number in the range of 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-100 is prime or composite.
- 4.OA.C.5 Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. For example, given the rule “Add 3” and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.
- 5.OA.A.1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.
- 5.OA.A.2 Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. For example, express the calculation “add 8 and 7, then multiply by 2” as  $2 \cdot (8+7)$ . Recognize that  $3 \cdot (18932+921)$  is three times as large as  $18932+921$ , without having to calculate the indicated sum or product.
- 5.OA.B.3 Generate two numerical patterns using two given rules, identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. For example, given the rule “Add 3” and the starting number 0, and given the rule “Add 6” and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.

**Unit Essential Questions:**

- How are addition and subtraction related?
- How are addition and multiplication related?
- How are multiplication and division related?
- How are equations written and solved?

**Unit Enduring Understandings:**

- The four operations – addition, subtraction, multiplication, and division – are related.

**Unit Learning Targets:**

*Students will...*

- Use manipulatives to solve addition and subtraction problems.
- Use manipulatives to find the missing addend in an addition problem.
- Practice solving equations using different strategies.
- Illustrate the relationship between addition and subtraction.
- Illustrate the relationship between addition and multiplication.
- Use manipulatives to solve multiplication and division problems.
- Determine the rule in a pattern or input/output table.

- Solve addition, subtraction, multiplication, division equations with variables.

#### Evidence of Learning

#### Assessments:

- Completed assignments
- Progress monitoring of skills
- Observation

#### Lesson Plans

Lesson Number and Title	Lesson Description
A76 – Input/Output Tables	Students use a table to work with a particular rule. Complete A76.
A77 – Geometric Growth Patterns	Students explore multiplication by completing patterns. Complete A77.
A78 – Translating Words to Expressions	Students write and solve equations based on story information. Complete A78.
B1 – Addition	Students use counters to act out joining stories. Students write the numbers involved. Complete B1.
B2 – Subtraction	Students use counters to act out stories of objects leaving. Students write the numbers involved. Complete B2.
B3 – Finding Sums	Students use counters to act out joining stories then use numbers and symbols (+,=) to show what happened. Complete B3.
B4 – Finding Differences	Students use counters to act out stories of objects leaving then use numbers and symbols (-,=) to show what happened. Complete B4.
B5 – Making 6 and 7	Students fill in circles using two different colors to show possible ways of making a number. Record combinations. Complete B5.
B6 – Making 8 and 9	Students fill in circles using two different colors to show possible ways of making a number. Record combinations. Complete B6.
B7 – Joining Stories	Students use counters to act out joining stories then write equations to match the story. Complete B7.
B8 – Adding Across and Down	Students use domino pieces to create addition problems. Students write their equation in the direction of the domino (When the domino is lying horizontally, the equation is written horizontally. When the domino is turned vertically, the equation is written vertically. The answer is the same. ). Complete B8.
B9 – Adding in Any Order	Students solve two related problems (e.g., $3+2=$ , $3+2=$ ) using a method of their choice. Discuss the answers and realize the addends can be written in any order. Complete B9.
B10 – Parts of Ten	Students use counters and a ten frame to find different ways to make 10. Record possibilities. Complete B10.
B11 – Adding with 0, 1, 2	Students use counters to practice finding one more, two more, or 0 more than a given number. Complete B11.
B12 – Adding Doubles	Students use snap cubes to make two equal trains of cubes.

	Join the cubes together and record the result. Repeat with different length trains. Discuss patterns. Complete B12.
B13 – Using Doubles to Add	Students use snap cubes to make two equal trains of cubes. Then students add an additional cube to one train and find the sum. Discuss patterns. Complete B13.
B14 – Facts with 5 on a Ten-Frame	Students use counters to show 5 on a ten frame. Students add additional counters and find sum. Finally, students discover how many more are needed to make 10. Complete B14.
B15 – Making 10 on a Ten-Frame	Students use counters to make ten on a ten frame then add additional counters. Find sum. Students then make 9 on the ten frame and add additional counters to make a total of 12. Discuss patterns. Complete B15.
B16 – Missing Parts	Students are told a number and are given a part of that number in counters. Students find the missing part using a ten frame to make the whole. Complete B16.
B17 – Separating Stories	Students solve problems about objects leaving a set amount. They use counters and pictures as needed. Complete B17.
B18 – Comparing Stories	Students arrange two groups of objects next to each other and match them. They discover how many more are in one group. Complete B18.
B19 – Relating Addition and Subtraction	Students use two different color snap cubes to make a train and write an addition number sentence. Students then take off one color of cubes and write the related subtraction sentence. Complete B19.
B20 – Missing Parts of 10	Students are given a whole of ten and a “part I know” amount. Using counters and a ten frame, students determine the missing part. Complete B20.
B21 – Subtracting Across and Down	Students use domino pieces to create subtraction problems. Students write their equation in the direction of the domino (When the domino is lying horizontally, the equation is written horizontally. When the domino is turned vertically, the equation is written vertically. The answer is the same. ). Complete B21.
B22 – Subtracting with 0, 1, and 2	Students use counters to practice finding one less, two less, or 0 less than a given number. Complete B22.
B23 – Using Doubles to Subtract	Students use two different color snap cubes to make equal trains. Students connect and then break apart trains, writing addition and subtraction equations as they do. Complete B23.
B24 – Thinking Addition to 12 to Subtract	Students use counters and a part, part, whole mat to create related addition and subtraction equations. Complete B24.
B25 – Stories about Joining	Students use counters and a part, part, whole mat to write and solve addition equations. Complete B25.
B26 – Doubles to 18	Students practice using snap cubes to solve doubles addition sentences. Complete B26.
B27 – Using Doubles to Add	Students use snap cubes to make two equal trains of cubes. Then students add an additional cube to one train and find the sum. Discuss patterns. Complete B27.

B28 – Adding 10	Students use counters and a ten frame to show 10. Students then add additional counters to make numbers larger than 10. Students write addition sentences for the new amounts. Complete B28.
B29 – Making 10 to Add 9	Students use counters and ten frames to explore patterns in adding with 9 in regards to 10 (e.g., $9+6=10+5$ ). Complete B29.
B30 – Making 10 to Add 8	Students use counters and ten frames to explore patterns in adding with 8 in regards to 10 (e.g., $8+6=10+4$ ). Complete B30.
B31 – Adding Three Numbers	Students use counters to make three piles and write an addition sentence to match. Students combine two piles and create new sentence. Students add final pile and record sum. Complete B31.
B32 – Stories about Separating	Students use counters and a part, part, whole mat to write and solve subtraction equations. Complete B32.
B33 – Stories about Comparing	Students use counters to write and solve equations about comparing numbers of objects. Complete B33.
B34 – Relating Addition and Subtraction to 18	Students use part, part, whole mats and counters to write and solve related addition and subtraction equations. Complete B34.
B35 – Fact Families	Students use part, part, whole mats and counters to create four related equations, 2 addition and 2 subtraction. Complete B35.
B36 – Thinking Addition to Subtract Doubles	Students use two different color snap cubes to make equal trains. Students connect and then break apart trains, writing addition and subtraction equations as they do. Complete B36.
B37 – Using Addition to 18 to Subtract	Students use counters and a part, part, whole mat to create related addition and subtraction equations. Complete B37.
B38 – Finding the Missing Part	Students are given a total number and one addend. Using counters, students determine the missing part and write an equation. Complete B38.
B39 – Using Subtraction Strategies	Students review different methods for finding the answer of a subtraction problem. Students practice using a preferred method. Complete B39.
B40 – Subtraction Facts with 10	Students use counters and ten frames to show ways to subtract 10. Complete B40.
B41 – Addition Properties	Students use color tiles and paper mats to demonstrate the associative property ( $a+b=b+a$ ). Complete B41.
B42 – Relating Addition and Subtraction	Students use counters and illustrations to show relationship between addition and subtraction problems. Results are recorded in fact family statements. Complete B42.
B43 – Multiplication as Repeated Addition	Students use counters and illustrations to show the repeated addition of the same number. Rewrite the addition sentences as multiplication. Complete B43.
B44 – Arrays and Multiplication	Demonstrate making an array (e.g., 4 rows with 2 counters in each row). Write as a multiplication sentence and solve. Complete B44.
B45 – Using Multiplication to Compare	Students use counters to write and solve multiplication

	equations where one set is $n$ times as much as another. Complete B45.
B46 – Writing Multiplication Stories	Students explore creating word problems using basic multiplication facts. Students use counters to solve. Complete B46.
B47 – Multiplying by 2 and 5	Students use number lines to illustrate skip counting to find the multiples of 2 and 5. Write matching equations. Complete B47.
B48 – Multiplying by 9	Students demonstrate that the sum of the digits in the product of a $\times 9$ problem is always 9. Complete B48.
B49 – Multiplying by 1 or 0	Students use counters to make arrays for $\times 1$ . Students record the answers to $\times 1$ and $\times 0$ problems. Complete B49.
B50 – Multiplying by 3	Students use counters to make $\times 3$ arrays and record their answers. Complete B50.
B51 – Multiplying by 4	Students use counters to make $\times 4$ arrays and record their answers. Complete B51.
B52 – Multiplying by 6 or 7	Students use counters to make $\times 6$ and $\times 7$ arrays and record their answers. Complete B52.
B53 – Multiplying by 8	Students use counters to make $\times 8$ arrays and record their answers. Complete B53.
B54 – Multiplying by 10	Students use number lines to skip count to find the multiples of 10. Write matching equations. Complete B54.
B55 – Multiplying by 11 and 12	Students explore different strategies with which to solve $\times 11$ and $\times 12$ equations. Complete B55.
B56 – Multiplying Three Numbers	Students are guided through solving the multiplication of three numbers to discover that the order in which factors are multiplied do not matter. Complete B56.
B57 – Meanings for Division	Students use counters and illustrations to practice breaking a whole into equal parts. Complete B57.
B58 – Writing Division Stories	Students explore creating word problems using basic facts. Students use counters to solve. Complete B58.
B59 – Relating Multiplication and Division	Students use counters and pictures to illustrate the relationship between multiplication and division. Complete B59.
B60 – Dividing by 2 Through 5	Students use counters to solve division problems. Complete B60.
B61 – Dividing by 6 and 7	Students use counters to solve problems in which numbers are divided into 6 or 7 equal groups. Complete B61.
B62 – Dividing by 8 and 9	Students use counters to solve problems in which numbers are divided into 8 or 9 equal groups. Complete B62.
B63 – 0 and 1 in Division	Students use related multiplication facts to solve problems where 0 or 1 are the divisors. Complete B63.
E19 – Draw a Picture and Write a Number Sentence	Students use counters and illustrations to solve addition and subtraction sentences. Complete E19.
E20 – Draw a Picture and Write a Number Sentence	Students use illustrations to solve multiplication sentences. Complete E20.
E21 – Make a Table and Look for a	Students use tables and patterns to solve word problems.

Pattern	Complete E21.
E22 – Act It Out	Students practice problem solving by acting out the information from a word problem. Complete E22.
E23 – Make an Organized List	Students use lists and logic to determine an unknown amount in word problems. Complete E23.
E24 – Try, Check, and Revise	Students use addition, subtraction, multiplication, and/or division to solve multi-step word problems. Complete E24.
E25 – Draw a Picture and Write a Number Sentence	Students use illustrations to solve multiplication sentences. Complete E25.
E26 – Draw a Picture and Write a Number Sentence	Students use illustrations to solve addition, subtraction, multiplication, and division sentences. Complete E26.
E27 – Draw a Picture and Write a Number Sentence	Students use illustrations to solve addition, subtraction, multiplication, and division sentences. Complete E27.
E32 – Reasonableness	Students estimate solutions to word problems and justify the reasonableness of their responses. Complete E32.
E33 – Write to Explain	Students justify their responses to a variety of word problems. Complete E33.
F24 – Input/Output Tables	Students look for a pattern in a table and determine the rule. Students complete a table. Complete F24.
F25 – Geometric Growth Patterns	Students look for patterns and use this pattern to complete tables. Complete F25.
F26 – Expressions with Addition and Subtraction	Students complete input/output and write addition and subtraction sentences from the information. Complete F26.
F27 – Expressions with Multiplication and Division	Students complete input/output and write multiplication and division sentences from the information. Complete F27.
F28 – Find a Rule	Students determine the rule when presented with information from an input/output table. Complete F28.
F29 – Patterns and Equations	Students use patterns to complete tables of information. Once the tables are completed, they write equations based on the information. Complete F29.
F35 – Translating Words to Expressions	Students use counters to help write addition, subtraction, multiplication, and/or division equations. Complete F35.
F36 – Equality and Inequality	Students examine number sentences and determine which sign (<, =, >) makes the statement true. Complete F36.
F37 – Multiplication Properties	Students practice multiplication problems which illustrate the zero property, identity property, commutative property, and the associative property of multiplication. Complete F37.
F38 – Expressions with Parentheses	Students solve multi-step problems by completing the portion of the problem in parentheses first. Complete F38.
F39 – Order of Operations	Students use the order of operations (parentheses, exponents, multiplication/division, addition/subtraction) to solve equations. Complete F39.
F40 – Using the Distributive Property	Students use counters to discover the distributive property. Complete F40.
F41 – Properties of Operations	Students summarize and utilize the properties of operations (commutative property of addition, associative property of addition, identity property of addition, commutative property

	of multiplication, associative property of multiplication, identity property of multiplication, and zero property of multiplication) to solve problems. Complete F41.
F42 – Variables and Expressions	Students determine the unknown value in an equation. Complete F42.
F43 – More Variables and Expressions	Students determine the unknown value in an equation. Complete F43.
F44 – Writing Expressions	Students use words and symbols to write equations. Complete F44.
F45 – Formulas and Equations	Students use formulas to solve equations. Complete F45.
F46 – Properties of Equality	Students use counters to show how each side of the equal sign are the same. Complete F46.
F47 – Solving Addition and Subtraction Equations	Students use counters to find the unknown value of an equation. Complete F47.
F48 – Solving Multiplication and Division Equations	Students use counters to find the unknown value of an equation. Complete F48.
F49 – Solving Equations with Whole Numbers	Students use inverse operations to solve equations. Complete F49.
F50 – Solving Equations with Decimals	Students use inverse operations to solve equations. Complete F50.
F51 – Writing Addition and Subtraction Equations	Students write equations with a variable from information gathered in word problems. Complete F51.
F52 – Writing Multiplication and Division Equations	Students write equations with a variable from information gathered in word problems. Complete F52.
F53 – Solving Equations with Fractions	Students write equations with a variable from information gathered in word problems. Complete F53.
F54 – Solving Equations with Integers	Students write equations with a variable from information gathered in word problems. Complete F54.
F55 – Solving Equations with More Than One Operation	Students write equations with a variable from information gathered in word problems. Complete F55.
G1 – Addition Properties	Students use manipulatives to practice working with the commutative and associative properties. Complete G1.
G3 – Adding on a Hundred Chart	Students use the hundred chart to add two numbers (e.g., $34+54$ means start at 34, move down five rows, move 3 spaces to the right). Complete G3.
G4 – Subtracting on a Hundred Chart	Students use the hundred chart to add two numbers (e.g., $87-52$ means start at 87, move up five rows, move 2 spaces to the left). Complete G4.
G5 – Using Mental Math to Add	Students use base ten pieces to show two digit addition problems, focusing on strategies (making ten) to assist in mental computation. Complete G5.
G6 – Using Mental Math to Subtract	Students use a number line to show two digit subtraction problems, focusing on strategies (subtracting to ten) to assist in mental computation. Complete G6.
G7 – Estimating Sums	Students use a number line to show rounding. They then use these estimates in addition problems. Complete G7.
G8 – Estimating Differences	Students use a number line to show rounding. They then use

	these estimates in subtraction problems. Complete G8.
G9 – Adding Two-Digit Numbers	Students use base ten pieces and a place value chart to demonstrate the addition of two two-digit numbers, regrouping as needed. Complete G9.
G10 – Subtracting Two-Digit Numbers	Students use base ten pieces and a place value chart to demonstrate the subtraction of two two-digit numbers, borrowing as needed. Complete G10.
G11 – Mental Math Strategies	Students break apart three digit numbers to add and subtract mentally. Complete G11.
G12 – Adding Three-Digit Numbers	Students use base ten pieces and a place value chart to demonstrate the addition of two three-digit numbers, regrouping as needed. Complete G12.
G13 – Subtracting Three-Digit Numbers	Students use base ten pieces and a place value chart to demonstrate the subtraction of two three-digit numbers, borrowing as needed. Complete G13.
G14 – Adding and Subtracting Money	Students use a place value chart to practice adding and subtracting with three numbers. Complete G14.
G15 – Estimating Sums and Differences	Students use a number line to show rounding. They then use these estimates in addition or subtraction problems. Complete G15.
G16 – Adding Three Numbers	Students use base ten pieces and a place value chart to demonstrate the addition of three numbers, regrouping as needed. Complete G16.
G17 – Subtracting Four-Digit Numbers	Students use a place value chart to subtract two four-digit numbers, borrowing as needed. Complete G17.
G18 – Subtracting Across Zero	Students use base ten pieces and a place value chart to subtract two three-digit numbers with zeroes, borrowing as needed. Complete G18.
G19 – Adding Greater Numbers	Students use a place value chart to add numbers through the ten thousands, regrouping as needed. Complete G19.
G20 – Subtracting Greater Numbers	Students use a place value chart to subtract numbers through the hundred thousands, borrowing as needed. Complete G20.
G42 – Dividing with Objects	Students use counters to divide a group into equal parts, identifying remainders. Complete G42.
G52 – Multiplying One-Digit and Four-Digit Numbers	Students use a place value chart to practice multiplying a four-digit number by a one-digit number, regrouping as needed. Complete G52.
G59 – Factoring Numbers	Students draw arrays to find the factor pairs of given numbers. Complete G59.
G60 – Divisibility by 2, 3, 5, 9, and 10	Students identify rules for determining whether a number can be divided by 2, 3, 5, 9, and 10, then test these rules with a variety of numbers. Complete G60.
G61 – Divisibility	Students identify rules for determining whether a number can be divided by 2, 3, 4, 5, 6, 9, and 10, then test these rules with a variety of numbers. Complete G61.
G62 – Exponents	Students write expressions with exponents in expanded form and determine the correct value. Complete G62.

G63 – Prime Factorization	Students practice breaking a number down to its prime factors using a factor tree. Complete G63.
G64 – Greatest Common Factor	Students use a venn diagram to show the common factors of two numbers. Students then identify the greatest common factor. Complete G64.
G65 – Least Common Multiple	Students use a table to list the first five multiples of two different numbers, looking for the smallest number in common. Complete G65.
G66 – Mental Math: Multiplying by Multiples of 10	Students use patterns of ten to find the answers to multiplication problems mentally ( $2 \times 3 = 6$ , $20 \times 3 = 60$ , $200 \times 300 = 60,000$ ). Complete G66.
G67 – Estimating Products	Students round numbers to the nearest convenient number in order to multiply mentally to find an estimated product. Complete G67.
G68 – Using Arrays to Multiply Two-Digit Factors	Students use grid paper to make diagrams showing the product of two-digit by two-digit multiplication. Complete G68.
G69 – Multiplying Two-Digit Numbers by Multiples of 10	Students “annex the zero” to multiply two two-digit numbers (to find the product of $24 \times 30$ , multiply $24 \times 3$ and add a zero to the end). Complete G69.
G70 – Multiplying by Two-Digit Numbers	Students practice multiplying a two-digit number by a two-digit number, regrouping as needed. Complete G70.
G71 – Multiplying Greater Numbers	Students practice multiplying a three-digit number by a two-digit number, regrouping as needed. Complete G71.
G72 – Mental Math: Using Properties	Students practice using the distributive property, the commutative property of multiplication, the associative property of multiplication, and the identity property of multiplication in order to multiply mentally. Complete G72.
G73 – Dividing by Multiples of 10	Students use patterns of ten to find the answers to division problems mentally ( $24$ divided by $3 = 8$ , $240$ divided by $3 = 80$ , $240$ divided by $30 = 8$ ). Complete G73.
G74 – Estimating Quotients with Two-Digit Divisors	Students round numbers to the nearest convenient number in order to divide mentally to find an estimated quotient. Complete G74.
G75 – Dividing by Two-Digit Divisors	Students practice dividing a three-digit number by a two-digit number. Complete G75.
G76 – One- and Two-Digit Quotients	Students practice dividing a three-digit number by a two-digit number. Complete G76.
G77 – Dividing Greater Numbers	Students practice dividing a four-digit number by a two-digit number. Complete G77.
<b>Resources</b>	
<b>Student Resources:</b> <ul style="list-style-type: none"> <li>• Counters</li> <li>• Snap Cubes</li> <li>• Color Tiles</li> <li>• Base Ten Pieces</li> <li>• Ten Frame Mats</li> </ul>	

- Part, Part, Whole Mats
- Place Value Chart
- Grid Paper

**Teacher Resources:**

- Math Diagnosis and Intervention System (Pearson Education, Inc.)

Unit Overview
<p><b>Content Area:</b> Basic Skills – Math</p>
<p><b>Unit Title:</b> Number and Operations in Base Ten</p>
<p><b>Grade Level:</b> Kindergarten to Fifth Grade</p>
<p><b>Unit Summary:</b> In this unit, students understand and use the place value system. They compare and order numbers, practice rounding, and estimate the probable solutions to problems. Students move through this unit based on their needs identified in MAP testing and diagnostic assessments. They do not complete each lesson.</p>
Learning Targets
<p><b>Common Core Standards:</b></p> <ul style="list-style-type: none"> <li>• K.NBT.A.1 Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (such as <math>18=10+8</math>); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.</li> <li>• 1.NBT.A.1 Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.</li> <li>• 1.NBT.B.2a 10 can be thought of as a bundle of ten ones – called a “ten”.</li> <li>• 1.NBT.B.2b The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.</li> <li>• 1.NBT.B.2c The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).</li> <li>• 1.NBT.B.3 Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols <math>&gt;</math>, <math>=</math>, <math>&lt;</math>.</li> <li>• 1.NBT.C.4 Add within 100, including adding a two-digit number and a one-digit number, and adding a two digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.</li> <li>• 1.NBT.C.5 Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.</li> <li>• 1.NBT.C.6 Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.</li> <li>• 2.NBT.A.1a 100 can be thought of as a bundle of ten tens – called a “hundred”.</li> <li>• 2.NBT.A.1b The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).</li> <li>• 2.NBT.A.2 Count within 1000; skip-count by 5s, 10s, and 100s.</li> <li>• 2.NBT.A.3 Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.</li> <li>• 2.NBT.A.4 Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using <math>&gt;</math>, <math>=</math>, <math>&lt;</math> symbols to record the results of comparisons.</li> </ul>

- 2.NBT.B.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
- 2.NBT.B.6 Add up to four two-digit numbers using strategies based on place value and properties of operations.
- 2.NBT.B.7 Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.
- 2.NBT.B.8 Mentally add 10 or 100 to a given number 100-900, and mentally subtract 10 or 100 from a given number 100-900.
- 2.NBT.B.9 Explain why addition and subtraction strategies work, using place value and the properties of operations.
- 3.NBT.A.1 Use place value understanding to round whole numbers to the nearest 10 or 100.
- 3.NBT.A.2 Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.
- 3.NBT.A.3 Multiply one-digit whole numbers by multiples of 10 in the range 10-90 (e.g.,  $9 \times 80$ ,  $5 \times 60$ ) using strategies based on place value and properties of operations.
- 4.NBT.A.1 Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. For example, recognize that  $700 \div 70 = 10$  by applying concepts of place value and division.
- 4.NBT.A.2 Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using  $>$ ,  $=$ ,  $<$  symbols to record the results of comparisons.
- 4.NBT.A.3 Use place value understanding to round multi-digit whole numbers to any place.
- 4.NBT.B.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm.
- 4.NBT.B.5 Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
- 4.NBT.B.6 Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
- 5.NBT.A.1 Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and  $1/10$  of what it represents in the place to its left.
- 5.NBT.A.2 Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.
- 5.NBT.A.3a Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g.,  $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$ .
- 5.NBT.A.3b Compare two decimals to thousandths based on meanings of the digits in each place, using  $>$ ,  $=$ ,  $<$  symbols to record the results of comparisons.
- 5.NBT.A.4 Use place value understanding to round decimals to any place.
- 5.NBT.B.5 Fluently multiply multi-digit whole numbers using the standard algorithm.
- 5.NBT.B.6 Find whole-number quotients of whole numbers with up to four-digit dividends and

<p>two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.</p> <ul style="list-style-type: none"> <li>5.NBT.B.7 Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.</li> </ul>	
<p><b>Unit Essential Questions:</b></p> <ul style="list-style-type: none"> <li>How do you read and write numbers through the trillions?</li> <li>How do you determine which numbers are greater?</li> <li>What are decimals and how are they read?</li> </ul>	<p><b>Unit Enduring Understandings:</b></p> <ul style="list-style-type: none"> <li>Understanding place value assists in the ability to add, subtract, multiply, and divide.</li> </ul>
<p><b>Unit Learning Targets:</b>  <i>Students will...</i></p> <ul style="list-style-type: none"> <li>Compare and order numbers.</li> <li>Use number patterns to determine more and less (e.g., 1 more, 1 less, 10 more, 10 less, etc.).</li> <li>Use manipulatives to show the number of hundreds, tens, and ones of a given number.</li> <li>Identify place value through the trillions.</li> <li>Write numbers in standard, expanded, and word form.</li> <li>Add numbers, mentally and with paper and pencil, regrouping as necessary.</li> <li>Subtract numbers, mentally and with paper and pencil, borrowing as necessary.</li> <li>Use number patterns and manipulatives to multiply and divide numbers.</li> <li>Read, write, and compare decimals to the millionths.</li> </ul>	
Evidence of Learning	
<p><b>Assessments:</b></p> <ul style="list-style-type: none"> <li>Completed assignments</li> <li>Progress monitoring of skills</li> <li>Observation</li> </ul>	
Lesson Plans	
<b>Lesson Number and Title</b>	<b>Lesson Description</b>
A11 – Comparing Numbers to 10	Students use counters to make two groups, each with less than ten objects, and determine which is greater and which is less. Students use words to describe. Complete A11.
A12 – Ordering Numbers to 12	Students use snap cubes to make three different numbers. Students arrange the numbers in least, between, and greatest order. Complete A13.
A13 – Ordering Numbers to 12 with a Number Line	Students use a number line to identify the least, between, and greatest number when given a list of three numbers. Complete A13.
A14 – Making Numbers 11 to 20	Students use counters and ten frames to make numbers larger than 10. Students describe the number as being 10 and however many more. Complete A14.
A15 – Using Numbers 11 to 20	Students use snap cubes to show one more, two more, and one fewer. Complete A15.
A16 – Using Skip Counting	Students use illustrations to count by 2s, 5s, and 10s. Complete

	A16.
A17 – Odd and Even	Students use snap cube trains to determine if a given number is even or odd. Complete A17.
A18 – Counting from Any Number	Students use a hundreds chart to practice counting on when given any number as a starting point. Complete A18.
A19 – Before, After, Between	When given a partial list of numbers, students determine what number comes before, after, or between. Complete A19.
A20 – Counting with Tens and Ones	Students divide a pile of objects into groups of tens and count the total number. Complete A20.
A21 – Estimating with Groups of 10s	Students divide a pile of objects into groups of tens and estimate the total number. Complete A21.
A23 – Tens	Students divide a pile of objects into groups of tens and tell how many tens they have made. Students then tell the total number. Complete A23.
A24 – Tens and Ones	When given base ten rods and singles, students tell how many tens, how many ones, and the total number. Complete A24.
A25 – Number Patterns to 100	Students use a hundred chart and crayons to highlight patterns with the number of ones. Complete A25.
A26 – 1 More or 1 Less, 10 More or Less	Students use base ten pieces to create a number and then show one more, one less, ten more, and ten less. Complete A26.
A27 – Using $>$ , $<$ , and $=$ to Compare Numbers	Students use base ten pieces to make two numbers. Students identify which number is greater and write a number sentence with $>$ , $<$ , or $=$ sign. Complete A27.
A28 – Ordering Three Numbers	Students use base ten pieces to make three numbers. Students arrange the numbers from least, between, and greatest. Students use $<$ appropriately. Complete A28.
A32 – Numbers to 100 on the Number Line	Students place numbers on a number line correctly. Complete A32.
A33 – Number Line Estimation	Students show about where numbers would lie on a number line when increments of ten are marked on the line. Complete A33.
A64 – Fractions and Decimals	Students use diagrams to show fractional parts and write them as decimals in tenths and hundredths. Complete A64.
A67 – Using Money to Understand Decimals	Students explore the value of cents in relation to decimals (tenths and hundredths). Complete A67.
A79 – Counting by Hundreds	Students use base ten pieces and a place value chart to show and count numbers by 100. Complete A79.
A80 – Building Numbers to 999	Students use base ten pieces and a place value chart to make three digit numbers. Students write the numbers in expanded form. Complete A80.
A81 – Reading and Writing Numbers to 999	Students practice reading and writing numbers in standard and word form. Complete A81.
A82 – Changing Numbers by Hundreds and Tens	Students use base ten pieces to show ten more and less, and one hundred more and less, than a given number. Complete A82.
A83 – Patterns with Numbers on Hundreds Charts	Students use the patterns within a hundred chart to predict and determine patterns with numbers to 1000. Complete A83.
A84 – Comparing Numbers to 999	Students use base ten pieces to make two three-digit numbers. Students identify which number is greater and write a number

	sentence with $>$ , $<$ , or $=$ sign. Complete A84.
A85 – Before, After, and Between	When given a partial list of numbers, students determine what number comes before, after, or between. Complete A85.
A86 – Ordering Numbers to 999	Students use base ten pieces to make three numbers. Students arrange the numbers from least, between, and greatest. Students use $<$ appropriately. Complete A86.
A87 – Numbers to 999 on the Number Line	Students show numbers on a number line and tell what comes before and after. Complete A87.
A88 – Skip Counting on the Number Line	Students use a number line and its patterns to skip count by 2s, 5s, and 10s. Complete A88.
A89 – Ways to Show Numbers	Students making groupings as follows: ten ones is a group of ten; ten tens is a group of one hundred. Students show different three-digit numbers and write them in standard, expanded, and word form. Complete A89.
A90 – Rounding to the Nearest Ten and Hundred	Students place numbers on a number line and tell which ten or hundred it is closer to. Complete A90.
A91 – Reading and Writing 4-Digit Numbers	Students use a place value chart to identify the number of thousands, hundreds, tens, and ones in a given number. Students read number correctly and write it in standard, word, and expanded form. Complete A91.
A92 – Numbers Halfway Between and Rounding	Students use a number line to plot a number halfway between two given numbers. Students practice rounding up to the next ten or hundred. Complete A92.
A93 – Comparing and Ordering Numbers	Students write numbers using a place value chart. Students examine the numbers to decide which is greater. Students use $<$ , $>$ , or $=$ correctly. Complete A93.
A94 – Place-Value Patterns	Students use centimeter grid paper to show the number of hundreds in numbers greater than 1000. Complete A94.
C1 – Adding Tens	Students use snap cubes to add groups of ten. Complete C1.
C2 – Adding on a Hundred Chart	Students use a hundred chart to add two given numbers (e.g., $14+23$ . Start at 14, move down two rows, move 3 spaces to the right). Complete C2.
C3 – Adding Tens to a Two-Digit Number	Students use snap cubes and skip counting to add groups of ten to another number. Complete C3.
C4 – Adding Two-Digit Numbers	Students use snap cubes and a place value chart to add two two-digit numbers. Complete C4.
C5 – Estimating Sums	Students use a number line to show which ten a number is closer to. Students add these tens together. Complete C5.
C6 – Regrouping in Addition	Students use snap cubes to add two numbers together. Students group the ones into a ten when needed. Complete C6.
C7 – Deciding When to Regroup in Addition	Students examine patterns with the numbers in the ones place to determine whether or not regrouping will be necessary. Complete C7.
C8 – Adding Two-Digit and One-Digit Numbers	Students use snap cubes and place value charts to show that numbers in the ones place are added first, regrouping as necessary. Complete C8.
C9 – Adding with Regrouping	Students use snap cubes, drawings, and place value charts to add

	two two-digit numbers, regrouping as necessary. Complete C9.
C10 – Two-Digit Addition	Students use snap cubes, drawings, and place value charts to add two two-digit numbers, regrouping as necessary. Complete C10.
C11 – Adding Three Numbers	Students use snap cubes to illustrate that numbers can be added in any order when adding three numbers together. Complete C11.
C12 – Subtracting Tens	Use snap cubes and illustrations to show the subtraction of groups of tens. Complete C12.
C13 – Finding Parts of 100	Students use snap cubes to count on and make one hundred when given a starting number. Complete C13.
C14 – Subtracting on a Hundred Chart	Students use a hundreds chart to find the answer in a subtraction problem (e.g., $57-23$ . Start at 57, move up two rows, more 3 spaces to left to get to 34). Complete C14.
C15 – Adding On To Subtract	Students use snap cubes and illustrations to find missing addends and make subtraction sentences. Complete C15.
C16 – Subtracting Tens from a Two-Digit Number	Students use snap cubes to illustrate how to subtract groups of ten from a two-digit number. Complete C16.
C17 – Subtracting Two-Digit Numbers	Students use snap cubes and place value charts to subtract a two-digit number from a two-digit number. Complete C17.
C18 – Estimating Differences	Students use a number line to show which ten a number is closer to. Students subtract these tens. Complete C18.
C19 – Subtracting Two-Digit and One-Digit Numbers	Students use snap cubes and a place value chart to subtract a one-digit number from a two-digit number, borrowing as needed. Complete C19.
C20 – Deciding When to Regroup in Subtraction	Students examine patterns with the numbers in the ones place to determine whether or not borrowing will be necessary. Complete C20.
C21 – Subtracting with Regrouping	Students use snap cubes and a place value chart to subtract a two-digit number from a two-digit number, borrowing as necessary. Complete C21.
C22 – Two-Digit Subtraction	Students use snap cubes and a place value chart to subtract a two-digit number from a two-digit number, borrowing as necessary. Complete C22.
C23 – Using Addition to Check Subtraction	Students use a part, part, whole mat to show the relationship between addition and subtraction. Complete C23.
C24 – Adding on a Hundred Chart	Students use a hundred chart to add two given numbers (e.g., $14+23$ . Start at 14, move down two rows, move 3 spaces to the right). Complete C24.
C25 – Subtracting on a Hundred Chart	Students use a hundreds chart to find the answer in a subtraction problem (e.g., $57-23$ . Start at 57, move up two rows, more 3 spaces to left to get to 34). Complete C25.
C26 – Using Mental Math to Add	Students use base ten pieces to practice adding two numbers together without using paper and pencil. Complete C26.
C27 – Using Mental Math to Subtract	Students use a number line to round numbers to the nearest ten to aid in their ability to solve subtraction problems mentally. Complete C27.
C28 – Adding Two-Digit Numbers	Students use snap cubes, drawings, and place value charts to add

	two two-digit numbers, regrouping as necessary. Complete C28.
C29 – Subtracting Two-Digit Numbers	Students use snap cubes and place value charts to subtract a two-digit number from a two-digit number. Complete C29.
C30 – Estimating Sums	Students use a number line to show which ten or hundred a number is closer to. Students add these numbers together. Complete C30.
C31 – Estimating Differences	Students use a number line to show which ten or hundred a number is closer to. Students subtract these numbers. Complete C31.
C32 – Mental Math Strategies	Students break a number into expanded form and use these pieces to mentally add numbers together. Complete C32.
C33 – Adding Three-Digit Numbers	Students use base ten pieces, drawings, and place value charts to add two three-digit numbers, regrouping as necessary. Complete C33.
C34 – Subtracting Three-Digit Numbers	Students use base ten pieces, drawings, and place value charts to subtract two three-digit numbers, regrouping as necessary. Complete C34.
C35 – Adding and Subtracting Money	Students use place value charts to add and subtract money. Complete C35.
C36 – Estimating Sums and Differences of Greater Numbers	Students use a number line to round numbers to the nearest 1000. Students add or subtract the rounded numbers. Complete C36.
C37 – Adding Three Numbers	Students use base ten pieces to illustrate that numbers can be added in any order when adding three numbers together. Complete C37.
C38 – Subtracting Four-Digit Numbers	Students use place value charts to subtract two four-digit numbers, regrouping as necessary. Complete C38.
C39 – Subtracting Across Zero	Students use base ten pieces and place value to regroup when subtracting with a zero. Complete C39.
C40 – Equality and Inequality	Students use counters to compare and solve equations with inequalities. Complete C40.
C41 – Mental Math: Multiplication Patterns	Students use base ten pieces to discover patterns in multiplication problems ( $4 \times 3$ , $4 \times 30$ , $4 \times 300$ ). Complete C41.
C42 – Mental Math: Division Patterns	Students use base ten pieces to discover patterns in division problems (1600 divided by 8, 160 divided by 8, 16 divided by 8). Complete C42.
C43 – Estimating Products	Students practice using multiplication patterns when they round numbers to the nearest 10 or 100 before multiplying. Complete C43.
C44 – Estimating Quotients	Students practice using division patterns when they round to the nearest convenient number before dividing. Complete C44.
C45 – Multiplication and Arrays	Students use base ten pieces and illustrations to show multiplication problems (two-digit $\times$ one-digit numbers). Complete C45.
C46 – Breaking Apart Numbers to Multiply	Students use base ten pieces and convenient numbers to multiply numbers (two-digit $\times$ one-digit numbers). Complete C46.

C47 – Multiplying Two-Digit Numbers	Students use base ten pieces and illustrations to show multiplication problems (two-digit x one-digit numbers). Complete C47.
C48 – Multiplying Three-Digit Numbers	Students use expanded form and the distributive property to explore the multiplication of a three digit number by a one digit number. Complete C48.
C49 – Multiplying Money	Students practice multiplying a three-digit number by a one-digit number. Complete C49.
C50 – Using Objects to Divide	Students use base ten pieces to divide a number into equal groups. Complete C50.
C51 – Dividing Two-Digit Numbers	Students use base ten pieces to divide a number into equal groups. Complete C51
C52 – Dividing Three-Digit Numbers	Students use base ten pieces to divide a number into equal groups. Complete C52.
C53 – Zeros in the Quotient	Students use base ten pieces to divide a number into equal groups with a zero in the quotient. Complete C53.
C54 – Dividing Money	Students practice dividing three-digit numbers by one-digit numbers. Complete C54.
C55 – Dividing Greater Numbers	Students practice dividing four-digit numbers by one-digit numbers. Complete C55.
F1 – Ways to Show Numbers	Students making groupings as follows: ten ones is a group of ten; ten tens is a group of one hundred. Students show different three-digit numbers and write them in standard, expanded, and word form. Complete F1.
F2 – Rounding to the Nearest Ten and Hundred	Students place numbers on a number line and tell which ten or hundred it is closer to. Complete F2.
F3 – Reading and Writing 4-Digit Numbers	Students use a place value chart to identify the number of thousands, hundreds, tens, and ones in a given number. Students read number correctly and write it in standard, word, and expanded form. Complete F3.
F4 – Numbers Halfway Between Rounding	Students use a number line to plot a number halfway between two given numbers. Students practice rounding up to the next ten or hundred. Complete F4.
F5 – Comparing and Ordering Numbers	Students write numbers using a place value chart. Students examine the numbers to decide which is greater. Students use $<$ , $>$ , or $=$ correctly. Complete F5.
F6 – Place Value Patterns	Students use centimeter grid paper to show the number of hundreds in numbers greater than 1000. Complete F6.
F7 – Place Value Through Thousands	Students use a place value chart to identify the number of hundred thousands, ten thousands, thousands, hundreds, tens, and ones in a given number. Students read number correctly and write it in standard, word, and expanded form. Complete F7.
F8 – Rounding Numbers Through Thousands	Students place numbers on a number line and tell which ten thousand or hundred thousand it is closer to. Complete F8.
F9 – Comparing and Ordering Numbers Through Thousands	Students write numbers using a place value chart. Students examine the numbers to decide which is greater. Students use

	<, >, or = correctly. Complete F9.
F10 – Place Value Through Millions	Students use a place value chart to identify the number of hundred millions, ten millions, millions, hundred thousands, ten thousands, thousands, hundreds, tens, and ones in a given number. Students read number correctly and write it in standard, word, and expanded form. Complete F10.
F11 – Rounding Numbers Through Millions	Students practice rounding numbers to the nearest million using number lines or sayings (Mark the spot, look to the right, 4 or less are out of sight. 5 and up you add one more, before they too are out the door. In the empty right hand spaces, zeroes take their proper places). Complete F11.
F12 – Comparing and Ordering Numbers Through Millions	Students write numbers using a place value chart. Students examine the numbers to decide which is greater. Students use <, >, or = correctly. Complete F12.
F13 – Place Value Through Billions	Students use a place value chart to identify the number of hundred billions, ten billions, billions, hundred millions, ten millions, millions, hundred thousands, ten thousands, thousands, hundreds, tens, and ones in a given number. Students read number correctly and write it in standard, word, and expanded form. Complete F13.
F14 – Place Value Through Trillions	Students use a place value chart to identify the number of hundred trillions, ten trillions, trillions, hundred billions, ten billions, billions, hundred millions, ten millions, millions, hundred thousands, ten thousands, thousands, hundreds, tens, and ones in a given number. Students read number correctly and write it in standard, word, and expanded form. Complete F13.
F15 – Exponents and Place Value	Students use a table to identify the exponent, expanded form, and the standard form of ten to the nth power. Students write numbers in expanded form using exponents. Complete F15.
F16 – Meaning of Integers	Students use a football type model to explore the meaning of integers. Complete F16.
F17 – Comparing and Ordering of Integers	Students examine positive numbers and negative numbers on a number line and determine their relationship to each other (less than, more than, etc.). Complete F17.
F18 – Comparing and Ordering of Rational Numbers	Students use a number line to compare and order whole numbers, decimals, and fractions. Complete F18.
F19 – Adding Integers	Students use a number line to add positive and negative numbers. Complete F19.
F20 – Subtracting Integers	Students use a number line to subtract positive and negative numbers. Complete F20.
F21 – Multiplying and Dividing Integers	Students use a number line to multiply and divide positive and negative numbers. Complete F21.
H22 – Place Value Through Hundredths	Students use grid paper and a place value chart to show decimal values to the hundredths. Complete H22.
H23 – Decimals on the Number Line	Students plot decimals on a number line to show position in relation to whole numbers. Complete H23.
H24 – Place Value Through	Students use a place value chart to read and write decimals to

Thousandths	the thousandths place. Complete H24.
H25 – Place Value Through Millionths	Students use a place value chart to read and write decimals to the millionths place. Complete H25.
H26 – Rounding Decimals Through Hundredths	Students use rounding chants and/or number lines to round decimals to the nearest whole, tenth, or hundredth. Complete H26.
H27 – Rounding Decimals Through Thousandths	Students use rounding chants and/or number lines to round decimals to the nearest whole, tenth, hundredth, or thousandth. Complete H27.
H28 – Comparing and Ordering Decimals Through Hundredths	Students use a place value chart to compare and order decimals. Complete H28.
H29 – Comparing and Ordering Decimals Through Thousandths	Students use a place value chart to compare and order decimals. Complete H29.
Resources	
<b>Student Resources:</b> <ul style="list-style-type: none"> <li>• Counters</li> <li>• Snap Cubes</li> <li>• Base Ten Pieces</li> <li>• Place Value Charts (whole numbers and decimals)</li> </ul>	
<b>Teacher Resources:</b> <ul style="list-style-type: none"> <li>• Math Diagnosis and Intervention System (Pearson Education, Inc.)</li> </ul>	

Unit Overview
<p><b>Content Area:</b> Basic Skills – Math</p>
<p><b>Unit Title:</b> Number and Operations – Fractions</p>
<p><b>Grade Level:</b> Kindergarten to Fifth Grade</p>
<p><b>Unit Summary:</b>  <p>In this unit, students develop an understanding of fractions as numbers. They explore equivalency and ordering. They learn to solve addition, subtraction, multiplication, and division equations with fractions. Students also develop an understanding of decimals as another way to write fractions.</p> <p>Students move through this unit based on their needs identified in MAP testing and diagnostic assessments. They do not complete each lesson.</p> </p>
Learning Targets
<p><b>Common Core Standards:</b></p> <ul style="list-style-type: none"> <li>• 3.NF.A.1 Understand a fraction <math>\frac{1}{b}</math> as the quantity formed by 1 part when a whole is partitioned into <math>b</math> equal parts; understand a fraction <math>\frac{a}{b}</math> as the quantity formed by <math>a</math> parts of a size <math>\frac{1}{b}</math>.</li> <li>• 3.NF.A.2a Represent a fraction <math>\frac{1}{b}</math> on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into <math>b</math> equal parts. Recognize that each part has size <math>\frac{1}{b}</math> and that the endpoint of the part based at 0 locates the number <math>\frac{1}{b}</math> on the number line.</li> <li>• 3.NF.A.2b Represent a fraction <math>\frac{a}{b}</math> on a number line diagram by marking off a lengths <math>\frac{1}{b}</math> from 0. Recognize that the resulting interval has size <math>\frac{a}{b}</math> and that its endpoint locates the number <math>\frac{a}{b}</math> on the number line.</li> <li>• 3.NF.A.3a Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.</li> <li>• 3.NF.A.3b Recognize and generate simple equivalent fractions, e.g., <math>\frac{1}{2} = \frac{2}{4}</math>, <math>\frac{4}{6} = \frac{2}{3}</math>. Explain why the fractions are equivalent, e.g., by using a visual fraction model.</li> <li>• 3.NF.A.3c Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. Examples: Express 3 in the form <math>3 = \frac{3}{1}</math>; recognize that <math>\frac{6}{1} = 6</math>; locate <math>\frac{4}{4}</math> and 1 at the same point of a number line diagram.</li> <li>• 3.NF.A.3d Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols <math>&gt;</math>, <math>=</math>, <math>&lt;</math>, and justify the conclusions, e.g., by using a visual fraction model.</li> <li>• 4.NF.A.1 Explain why a fraction <math>\frac{a}{b}</math> is equivalent to a fraction <math>\frac{n \cdot a}{n \cdot b}</math> by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.</li> <li>• 4.NF.A.2 Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as <math>\frac{1}{2}</math>. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols <math>&gt;</math>, <math>=</math>, <math>&lt;</math>, and justify the conclusions, e.g., by using a visual fraction model.</li> <li>• 4.NF.B.3a Understand addition and subtractions of fractions as joining and separating parts referring to the same whole.</li> <li>• 4.NF.B.3b Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by</li> </ul>

using a visual fraction model. Examples:  $3/8=1/8+1/8+1/8$ ;  $3/8=1/8+2/8$ ;  $2\ 1/8 = 1+1+1/8=8/8+8/8+1/8$ .

- 4.NF.B.3c Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.
- 4.NF.B.3d Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.
- 4.NF.B.4a Understand a fraction  $a/b$  as a multiple of  $1/b$ . For example, use a visual fraction model to represent  $5/4$  as the product  $5*(1/4)$ , recording the conclusion by the equation  $5/4=5*(1/4)$ .
- 4.NF.B.4b Understand a fraction  $a/b$  as a multiple of  $1/b$ , and use this understanding to multiply a fraction by a whole number. For example, use a visual fraction model to express  $3*(2/5)$  as  $6*(1/5)$ , recognizing this product as  $6/5$ . (In general,  $n*(a/b) = (n*a)/b$ )
- 4.NF.B.4c Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. For example, if each person at a party will eat  $3/8$  of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?
- 4.NF.C.5 Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. For example, express  $3/10$  as  $30/100$ , and add  $3/10 + 4/100 = 34/100$ .
- 4.NF.C.6 Use decimal notation for fractions with denominators 10 or 100. For example, rewrite  $0.62$  as  $62/100$ ; describe a length as  $0.62$  meters; locate  $0.62$  on a number line diagram.
- 4.NF.C.7 Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols  $>$ ,  $=$ ,  $<$ , and justify the conclusions, e.g., by using a visual model.
- 5.NF.A.1 Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. For example,  $2/3 + 5/4 = 8/12 + 15/12 = 23/12$ . (In general,  $a/b + c/d = (ad + bc)/bd$ .)
- 5.NF.A.2 Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. For example, recognize an incorrect result  $2/5 + 1/2 = 3/7$ , by observing that  $3/7 < 1/2$ .
- 5.NF.B.3 Interpret a fraction as division of the numerator by the denominator ( $a/b = a$  divided by  $b$ ). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. For example, interpret  $3/4$  as the result of dividing 3 by 4, noting that  $3/4$  multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size  $3/4$ . If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?
- 5.NF.B.4a Interpret the product  $(a/b)*q$  as a parts of a partition of  $q$  into  $b$  equal parts; equivalently, as the result of a sequence of operations  $a*q/b$ . For example, use a visual fraction model to show  $(2/3)*4=8/3$ , and create a story context for this equation. Do the same with  $(2/3)*(4/5)=8/15$ . (In general,  $(a/b)*(c/d)=ac/bd$ .)

- 5.NF.B.4b Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.
- 5.NF.B.5a Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.
- 5.NF.B.5b Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence  $a/b = (n*a)/(n*b)$  to the effect of multiplying  $a/b$  by 1.
- 5.NF.B.6 Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.
- 5.NF.B.7a Interpret division of a fraction by a non-zero whole number, and compute such quotients. For example, create a story context for  $(1/3)$  divided by 4, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that  $(1/3)$  divided by 4 =  $1/12$  because  $(1/12)*4=1/3$ .
- 5.NF.B.7b Interpret division of a whole number by a unit fraction, and compute such quotients. For example, create a story context for 4 divided by  $(1/5)$ , and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 divided by  $(1/5) = 20$  because  $20*(1/5)=4$ .
- 5.NF.B.7c Solve real world problems involving division of unit fractions by o-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. For example, how much chocolate will each person get if 3 people share  $\frac{1}{2}$  lb of chocolate equally? How many  $1/3$  cup servings are in 2 cups of raisins?

**Unit Essential Questions:**

- What are fractions?
- When given a set of fractions, which one represents a larger amount?
- How are fractions larger than one written?
- How are fractions added, subtracted, multiplied, or divided?
- What is simplest form?

**Unit Enduring Understandings:**

- Fractions can be represented with pictures, fraction strips, and number lines. They can be added, subtracted, multiplied, or divided.

**Unit Learning Targets:**

*Students will...*

- Find the fractional part of different wholes using pictures, fraction strips, and/or number lines.
- Compare and order fractional parts.
- Add and subtract fractions with like and unlike denominators.
- Multiply and divide fractions.
- Compare and order mixed numbers.
- Add, subtract, multiply, and divide mixed numbers.
- Write fractions in simplest form.
- Convert fractions to decimals, decimals to fractions, improper fractions to mixed numbers, and mixed numbers to improper fractions.

**Evidence of Learning**

**Assessments:**

- Completed assignments

- Progress monitoring of skills
- Observation

Lesson Plans

Lesson Number and Title	Lesson Description
A42 – Equal Parts of a Whole	Students use folded papers to show halves, fourths, etc. Discuss what it means for parts to be equal. Complete A42.
A43 – Parts of a Region	Students color parts of a circle different colors and use fractional representations (numerator/denominator) to tell about each color. Complete A43.
A44 – Parts of a Set	Students use two-color counters to show fractions. Students use numerator/denominator to tell how many counters are each color. Complete A44.
A45 – Fractions and Length	Students create fraction strips to show equal parts of a whole. Students work to realize that $n/n$ equals one whole. Complete A45.
A46 – Fractions on the Number Line	Students identify the fractional parts of a number line between 0 and 1. Complete A46.
A47 – Using Models to Compare Fractions	Students use fraction strips to compare two fractions. Students use $<$ , $>$ , or $=$ to create number sentences. Complete A47.
A48 – Using Models to Find Equivalent Fractions	Students use fraction strips to find two fractions which represent the same amount. Complete A48.
A49 – Equivalent Fractions	Students use fraction strips and multiplication patterns to create equivalent fractions. Complete A49.
A50 – Comparing Fractions on a Number Line	Students find different fractions and mixed numbers on a number line. Students use $<$ , $>$ , or $=$ to compare pairs of fractions. Complete A50.
A51 – Comparing Fractions	Students use fraction strips to see which of a pair of fractions is greater. Students use $<$ , $>$ , or $=$ to compare these fractions. Complete A51.
A52 – Adding Fractions with Like Denominators	Students use pictures represent the addition of two fractions with the same denominator. Complete A52.
A53 – Subtracting Fractions with Like Denominators	Students represent a fraction on an illustration. Students then cross out a section to show the amount being subtracted. Students record their answers. Complete A53.
H15 – Fractions and Division	Students use pictures to solve division word problems where fractions are the answers. Complete H15.
H16 – Estimating Fractional Amounts	Students use $\frac{1}{4}$ , $\frac{1}{3}$ , $\frac{1}{2}$ , $\frac{2}{3}$ , and $\frac{3}{4}$ as benchmark fractions to estimate the value of other fractions. Complete H16.
H17 – Simplest Form	Students find the greatest common factor of a numerator and a denominator. They use this number to find the simplest form. Complete H17.
H18 – Mixed Numbers	Students use fraction strips to model mixed numbers. They change improper fractions to mixed numbers and mixed numbers to improper fractions. Complete H18.
H19 – Comparing and Ordering Fractions	Students use a variety of strategies (comparing numerators if denominators are the same, comparing denominators if

	numerators are the same, finding the least common multiple) to compare and order fractions. Complete H19.
H20 – Comparing and Ordering Mixed Numbers	Students use pictures to compare the sizes of different mixed numbers. Complete H20.
H21 – Fractions and Mixed Numbers on the Number Line	Students use a number line to represent fractions and mixed numbers. Complete H21.
H30 – Relating Fractions and Decimals	Students convert fractions (tenths, hundredths) into decimals and decimals into fractions. Complete H30.
H31 – Decimals to Fractions	Students use grids to show decimals and then write them as fractions or mixed numbers. Complete H31.
H32 – Fractions to Decimals	Students practice converting fractions to decimals using grids as needed. Complete H32.
H33 – Relating Fractions and Decimals to Thousandths	Students practice converting fractions to decimals and decimals to fractions. Complete H33.
H34 – Using Models to Compare Fractions and Decimals	Students use grids to compare fractions and decimals. Complete H34.
H35 – Fractions, Decimals, and the Number Line	Students plot points on a number line to compare fractions and decimals. Complete H35.
H36 – Adding Fractions with Like Denominators	Students use pictures to add fractions with like denominators and write them in simplest form. Complete H36.
H37 – Subtracting Fractions with Like Denominators	Students use pictures to subtract fractions with like denominators and write them in simplest form. Complete H37.
H38 – Adding and Subtracting Fractions with Like Denominators	Students use fraction strips to add and subtract fractions with like denominators and write them in simplest form. Complete H38.
H39 – Adding and Subtraction Fractions on a Number Line	Students use a number line to add and subtract fractions with like denominators and write them in simplest form. Complete H39.
H40 – Adding Fractions with Unlike Denominators	Students use fraction strips to model adding fractions with unlike denominators and write them in simplest form. Complete H40.
H41 – Subtracting Fractions with Unlike Denominators	Students use fraction strips to model subtracting fractions with unlike denominators and write them in simplest form. Complete H41.
H42 – Estimating Sums and Differences of Mixed Numbers	Students use a number line to estimate a mixed number to the nearest whole number. Students add or subtract new numbers. Complete H42.
H43 – Adding Mixed Numbers	Students use fraction strips to show the addition of two mixed numbers with answers written in simplest form. Complete H43.
H44 – Subtracting Mixed Numbers	Students use fraction strips to show the subtraction of two mixed numbers with answers written in simplest form. Complete H44.
H45 – Multiplying Fractions by Whole Numbers	Students use counters to show how to multiply a whole number by a fraction. Complete H45.
H46 – Multiplying Two Fractions	Students use folded papers to show the multiplication of two

	fractions. Complete H46.
H47 – Understanding Division with Fractions	Students use pictures and folded papers to show a whole number divided by a fraction. Complete H47.
H48 – Dividing Fractions	Students use the reciprocal to divide one fraction by another. Complete H48.
H49 – Estimating Products and Quotients of Mixed Numbers	Students use a number line to estimate a mixed number to the nearest whole number. Students multiply or divide new numbers. Complete H49.
H50 – Multiplying Mixed Numbers	Students use drawings to demonstrate how to multiply two mixed numbers with answers written in simplest form. Complete H50.
H51 – Dividing Mixed Numbers	Students use drawings to demonstrate how to divide two mixed numbers with answers written in simplest form. Complete H51.
Resources	
<b>Student Resources:</b> <ul style="list-style-type: none"> <li>• Fraction strips</li> <li>• Counters</li> <li>• Various number lines</li> </ul>	
<b>Teacher Resources:</b> <ul style="list-style-type: none"> <li>• Math Diagnosis and Intervention System (Pearson Education, Inc.)</li> </ul>	

Unit Overview
<p><b>Content Area:</b> Basic Skills – Math</p>
<p><b>Unit Title:</b> Measurement and Data</p>
<p><b>Grade Level:</b> Kindergarten to Fifth Grade</p>
<p><b>Unit Summary:</b> In this unit, students describe and compare measurable attributes (length, time, weight, volume, etc.), converting units as necessary. They represent and interpret data. Students move through this unit based on their needs identified in MAP testing and diagnostic assessments. They do not complete each lesson.</p>
Learning Targets
<p><b>Common Core Standards:</b></p> <ul style="list-style-type: none"> <li>• K.MD.A.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.</li> <li>• K.MD.A.2 Directly compare two objects with a measurable attribute in common, to see which object has “more of”/“less of” the attribute, and describe the difference. For example, directly compare the heights of two children and describe one child as taller/shorter.</li> <li>• K.MD.A.3 Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.</li> <li>• 1.MD.A.1 Order three objects by length; compare the lengths of two objects indirectly by using a third object.</li> <li>• 1.MD.A.2 Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.</li> <li>• 1.MD.B.3 Tell and write time in hours and half-hours using analog and digital clocks.</li> <li>• 1.MD.C.4 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.</li> <li>• 2.MD.A.1 Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.</li> <li>• 2.MD.A.2 Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.</li> <li>• 2.MD.A.3 Estimate lengths using units of inches, feet, centimeters, and meters.</li> <li>• 2.MD.A.4 Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.</li> <li>• 2.MD.B.5 Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.</li> <li>• 2.MD.B.6 Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represent whole-number sums and differences within 100 on a number line diagram.</li> <li>• 2.MD.C.7 Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.</li> </ul>

- 2.MD.C.8 Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using \$ and cents symbols appropriately. Example: If you have 2 dimes and 3 pennies, how many cents do you have?
- 2.MD.D.9 Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.
- 2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.
- 3.MD.A.1 Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.
- 3.MD.A.2 Measure and estimate liquid volumes and masses of objects using standard units of grams, kilograms, and liters. Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.
- 3.MD.B.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled graphs. For example, draw a bar graph in which each square in the bar graph represent 5 pets.
- 3.MD.B.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units – whole numbers, halves, or quarters.
- 3.MD.C.5a A square with side length 1 unit, called “a unit square,” is said to have “one square unit” of area, and can be used to measure area.
- 3.MD.C.5b A plane figure which can be covered without gaps or overlaps by  $n$  unit squares is said to have an area of  $n$  square units.
- 3.MD.C.6 Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).
- 3.MD.C.7a Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.
- 3.MD.C.7b Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.
- 3.MD.C.7c Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths  $a$  and  $b + c$  is the sum of  $a \cdot b$  and  $a \cdot c$ . Use area models to represent the distributive property in mathematical reasoning.
- 3.MD.C.7d Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.
- 3.MD.D.8 Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.
- 4.MD.A.1 Know relative sizes of measurement units within one system of units including km, m, cm, kg, g; lb, oz; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a

two-column table. For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...

- 4.MD.A.2 Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.
- 4.MD.A.3 Apply the area and perimeter formulas for rectangles in real world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.
- 4.MD.B.4 Make a line plot to display a data set of measurements in fractions of a unit ( $\frac{1}{2}$ ,  $\frac{1}{4}$ ,  $\frac{1}{8}$ ). Solve problems involving addition and subtraction of fractions by using information presented in a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.
- 4.MD.C.5a An angle is measure with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through  $\frac{1}{360}$  of a circle is called a “one-degree angle,” and can be used to measure angles.
- 4.MD.C.5b An angle that turns through  $n$  one-degree angles is said to have an angle measure of  $n$  degrees.
- 4.MD.C.6 Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.
- 4.MD.C.7 Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.
- 5.MD.A.1 Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0,05 m), and use these conversions in solving multi-step, real world problems.
- 5.MD.B.2 Make a line plot to display a data set of measurements in fractions of a unit ( $\frac{1}{2}$ ,  $\frac{1}{4}$ ,  $\frac{1}{8}$ ). Use operations on fractions for this grade to solve problems involving information presented in line plots. For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.
- 5.MD.C.3a A cube with side length 1 unit, called a “unit cube,” is said to have “one cubic unit” of volume, and can be used to measure volume.
- 5.MD.C.3b A solid figure which can be packed without gaps or overlaps using  $n$  unit cubes is said to have a volume of  $n$  cubic units.
- 5.MD.C.4 Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.
- 5.MD.C.5a Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.

<ul style="list-style-type: none"> <li>• 5.MD.C.5b Apply the formulas <math>V=l*w*h</math> and <math>V=b*h</math> for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.</li> <li>• 5.MD.C.5c Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.</li> </ul>	
<b>Unit Essential Questions:</b> <ul style="list-style-type: none"> <li>• What are the values of coins and bills?</li> <li>• How are digital and analog clocks read?</li> <li>• How much time passes between different events?</li> <li>• How are length, capacity, and weight measured using standard units?</li> <li>• How are length, capacity, and weight measured using metric units?</li> <li>• How are area and perimeter measured?</li> </ul>	<b>Unit Enduring Understandings:</b> <ul style="list-style-type: none"> <li>• A variety of materials can be used to measure length, capacity, weight, time, and money.</li> <li>• Data can be represented with different types of graphs and analyzed and interpreted to meet specific needs.</li> </ul>
<b>Unit Learning Targets:</b> <i>Students will...</i> <ul style="list-style-type: none"> <li>• Identify different coins and bills and determine their worth.</li> <li>• Count money and make change.</li> <li>• Use analog and digital clocks to tell time to the hour, half-hour, quarter-hour, five minutes, and minute.</li> <li>• Determine the elapsed time between two events.</li> <li>• Read and record temperature using a thermometer.</li> <li>• Measure length, weight, and capacity using a variety of tools and units.</li> <li>• Measure and classify angles.</li> <li>• Measure the area and perimeter of shapes.</li> <li>• Read, make, and analyze data on various types of graphs (picture, bar, line, etc.).</li> <li>• Determine the likelihood of different outcomes.</li> </ul>	
Evidence of Learning	
<b>Assessments:</b> <ul style="list-style-type: none"> <li>• Completed assignments</li> <li>• Progress monitoring of skills</li> <li>• Observation</li> </ul>	
Lesson Plans	
<b>Lesson Number and Title</b>	<b>Lesson Description</b>
A54 – Money	Students use coin manipulatives and sort them by type. Students match coins with their value. Complete A54.
A55 – Pennies and Nickels	Students are given penny and nickel coins and tell how much money they have. Complete A55.
A56 – Dimes	Students use dimes and tell how much money they have. Complete A56.
A57 – Counting Pennies, Nickels, and Dimes	Students use coin manipulatives to make specific amounts of money. Complete A57.
A58 – Quarters	Students use quarters and other coins to make specific amounts of money. Complete A58.

A59 – Half-Dollars	Students use half-dollars and other coins to make specific amounts of money. Complete A59.
A60 – Counting Sets of Coins	Students use coin manipulatives to make specific amounts of money. Complete A60.
A61 – Comparing Sets of Coins	Students determine the amount of money in two piles of coins. Students tell which pile is more and write number sentences using $<$ , $>$ , or $=$ to compare. Complete A61.
A62 – Ways to Show the Same Amount	Students use various coins to show different ways to make the same amount of money. Complete A62.
A63 – Dollars	Students use dollar bills and coins and tell how much money they have. Complete A63.
A65 – Counting Money	Students use dollar bills and coins and tell how much money they have. Complete A65.
A66 – Making Change	Students solve word problems involving making change using coin manipulatives. Complete A66.
D1 – Time	Students discuss the amount of time different activities take to complete. Complete D1.
D2 – Days and Seasons	Students examine pictures of different times of year and activities to determine in which season each occurs. Complete D2.
D3 – Calendar	Students examine the patterns in the way a calendar is set up. Complete D3.
D4 – Time to the Hour	Students read and represent time to the hour using an analog clock. The time is recorded in word form. Complete D4.
D5 – Time to the Half Hour	Students read and represent time to the half hour using an analog clock. Time is recorded in word and symbol form. Complete D5.
D6 – Ordering and Estimating Time	Students estimate the length of time to complete an activity and order the activities from shortest amount of time to longest. Complete D6.
D7 – Using a Calendar	Students use the patterns on a calendar to answer questions. Complete D7.
D8 – Time to Five Minutes	Students read and represent time to the five minute intervals using an analog clock. Time is recorded in word and symbol form. Complete D8.
D9 – Time Before and After the Hour	Students explore different ways to read the same time (e.g., 25 minutes after an hour; 35 minutes before an hour). Complete D9.
D10 – Equivalent Times	Students explore different ways to say the same amount of time (e.g., 30 minutes and half-hour). Complete D10.
D11 – Comparing Temperatures	Students classify objects as hot or cold and compare the temperatures to the temperatures of other objects. Complete D11.
D12 – Measuring Temperature	Students read and record temperatures on a thermometer. Complete D12.
D13 – Time to the Quarter Hour	Students use analog and digital clocks to tell time to the quarter hour. Complete D13.

D14 – Telling Time	Students use analog and digital clocks to tell time to the minute. Complete D14.
D15 – Units of Time	Students convert like amounts of time (e.g., 1 week is 7 days). Complete D15.
D16 – Elapsed Time	Students use analog clocks to assist in determining how much time has passed from one activity to another. Complete D16.
D17 – Temperature	Students use thermometers to measure temperature to the nearest degree. Students compare two temperatures. Complete D17.
D18 – Comparing and Ordering by Length	Students compare snap cube trains to determine which is longer. The procedure is repeated with pictures of different objects. Complete D18.
D19 – Comparing and Ordering by Capacity	Students choose two containers and fill one with rice. Students tell if the other container would hold more or less. Complete D19.
D20 – Comparing and Ordering by Weight	Students examine a group of objects and tell which are heavier and which are lighter. Complete D20.
D21 – Comparing Areas	Students use color tiles to determine the area of different shapes and tell which takes up the most space. Complete D21.
D22 – Unit Size and Measuring	Students estimate the length of different objects and measure them using paperclips and snap cubes. Complete D22.
D23 – Inches and Feet	Students estimate the length of common objects using inches and feet. Complete D23.
D24 – Inches, Feet, and Yards	Students estimate the length of common objects using inches, feet, and yards. Complete D24.
D25 – Inches	Students estimate the length of objects in pictures and check their estimates by measuring the inches with a ruler. Complete D25.
D26 – Centimeters and Meters	Students estimate the length of common objects using centimeters and meters. Complete D26.
D27 – Centimeters	Students estimate the length of objects in pictures and check their estimates by measure the centimeters with a ruler. Complete D27.
D28 – Exploring Capacity	Students estimate the number of cups different containers can hold. Complete D28.
D29 – Cups, Pints, and Quarts	Students examine a cup, pint, and quart and tell if common objects would hold more or less than these measures. Complete D29.
D30 – Liters	Students determine if different containers would hold more or less than a liter. Complete D30.
D31 – Estimating and Measuring Weight	Students use a balance and snap cubes to weigh different objects. Complete D31.
D32 – Pounds	Students determine if different objects weigh more, less, or about a pound. Complete D32.
D33 – Pounds and Ounces	Students estimate the number of pounds or ounces different

	objects weigh. Complete D33.
D34 – Grams and Kilograms	Students estimate the number of grams or kilograms different objects weigh. Complete D34.
D35 – Perimeter	Students use one inch straw pieces to measure the outside of different shapes. Complete D35.
D36 – Exploring Area	Students use pattern block squares to measure the area of different shapes. Complete D36.
D37 – Measuring Length to $\frac{1}{2}$ and $\frac{1}{4}$ Inch	Students use an inch ruler to measure objects to the nearest quarter inch marking. Complete D37.
D38 – Using Customary Units of Length	Students practice converting inches, feet, yards, and miles. Complete D38.
D39 – Using Metric Units of Length	Students estimate the number of millimeters, centimeters, or meters different objects measure. Complete D39.
D40 – Using Customary Units of Capacity	Students determine which unit of measurement – cups, pints, quarts, gallons – is best to use for different containers. Students practice converting these measurements. Complete D40.
D41 – Using Metric Units of Capacity	Students practice liter and milliliter conversions. Complete D41.
D42 – Using Customary Units of Weight	Students decide which unit of measurement – ounces, pounds, or tons – is best to use for different objects. Complete D42.
D43 – Using Metric Units of Mass	Students practice making gram and kilogram conversions. Complete D43.
D44 – Perimeter	Students use centimeter grids to determine the perimeter of different shapes. Complete D44.
D45 – Finding Area on a Grid	Students use centimeter grids to determine the area of different shapes. Complete D45.
D46 – Counting Cubes to Find Volume	Students use unit cubes and illustrations to determine the volume of rectangular prisms. Complete D46.
D69 – Graphing	Students use counters or crayons to show data on a basic bar graph. Students compare the information to tell which shows more. Complete D69.
D70 – Reading Picture Graphs	Students analyze data in picture graphs to answer questions about a topic. Complete D70.
D71 – Reading Bar Graphs	Students compare data sets by examining the heights or lengths of bar graphs. Complete D71.
D72 – Tallying Results	Students make tally marks to organize information for a group of results. Complete D72.
D73 – Real Graphs	Students use given tally marks to create bar graphs. Students analyze data to compare information. Complete D73.
D74 – Data and Picture Graphs	Students make tally marks to organize information and then use those marks to create a picture graph. Students analyze data to compare information. Complete D74.
D75 – Making Bar Graphs	Students use a table of information to make a bar graph then compare the data. Complete D75.
D77 – Range and Mode	Students create bar graphs based on a set of data. They find

	the range and mode of the data. Complete D77.
D78 – Likely or Unlikely	Students complete spinner experiments and tally their results. Students determine whether certain outcomes are more likely. Complete D78.
D79 – Certain or Impossible	Students discover which conditions must be met to make outcomes certain or impossible. Complete D79.
D80 – Certain, Probable, Impossible	Students use snap cubes to complete an experiment to see which outcomes would be certain, probable, or impossible. Complete D80.
D82 – Recording Data from a Survey	Students conduct a survey and record their results using tally marks. Students analyze their data to answer questions. Complete D82.
D83 – Reading and Making Pictographs	Students use a table displaying data to create a picture graph. Students analyze their data to answer questions. Complete D83.
D84 – Reading and Making a Bar Graph	Students use a table displaying data to create a bar graph. Students label each axis and create a scale. Students analyze their data to answer questions. Complete D84.
D85 – Making Line Plots	Students use a table displaying data to create a line plot and analyze their data to answer questions. Complete D85.
D86 – How Likely?	Students use color tiles to complete an experiment and determine the likelihood of different outcomes. Complete D86.
D87 – Outcomes and Experiments	Students use a spinner, tally marks, tables to determine the likelihood of different outcomes. Complete D87.
D88 – Line Plots and Probability	Students conduct an experiment and create a line plot to determine the probability of different outcomes. Complete D88.
D89 – Making Bar Graphs to Show Outcomes	Students conduct an experiment and create a bar graph to display results. Students interpret the results. Complete D89.
E4 – Use Data from a Table or Chart	Students read information from a table to answer questions. Complete E4.
E9 – Look for a Pattern	Students examine a snap cube train and try to determine a pattern. They apply this skill to a list of numbers. Complete E9.
E10 – Look for a Pattern	Students examine a snap cube train and try to determine a pattern. They apply this skill to a list of numbers. Complete E10.
E11 – Make a Table and Look for a Pattern	Students are given two criteria and create a table to display information (e.g., 2 wheels, number of bikes). Complete E11.
E12 – Make a Table	Students use counters to show different combinations. Results are displayed using a table. Complete E12.
I17 – Measuring and Classifying Angles	Students use a protractor to measure angles, which are then classified as acute, right, or obtuse. Complete I17.
I18 – Angle Pairs	Students identify different angles in a diagram and find the measurement of complementary angles and supplementary angles. Complete I18.

I19 – Missing Angles in Triangles and Quadrilaterals	Students make a triangle and cut off the corners to show the angles together measure 180 degrees. The same is done with a rectangle to show the total measurement to be 360 degrees. With this information, students find the missing measurements in triangles and rectangles. Complete I19.
I20 – Constructions	Students use a protractor and ruler while following directions to make angles and shapes. Complete I20.
I33 – Converting Customary Units of Length	Students use a chart to make conversions between inches, feet, yards, and miles. Complete I33.
I34 – Converting Customary Units of Capacity	Students use a chart to make conversions between teaspoons, tablespoons, cups, pints, quarts, and gallons. Complete I34.
I35 – Converting Customary Units of Weight	Students use a chart to make conversions between ounces, pounds, and tons. Complete I35.
I36 – Converting Metric Units	Students use a chart and the base ten system to make conversions between kilo-, hecto-, deka-, unit, deci-, centi-, and milli- measurements. Complete I36.
I37 – Converting Between Measurement Systems	Students use formulas to make conversions between the customary units and the metric units. Complete I37.
I38 – Units of Measure and Precision	Students work through several situations to determine that smaller units provide more precise measurements. Complete I38.
I39 – More Units of Time	Students make conversions between seconds, minutes, hours, days, weeks, months, years, decades, centuries, and millennium. Complete I39.
I40 – More Elapsed Time	Students use analog clocks to determine the amount of time which passes between two events. Complete I40.
I41 – Elapsed Time in Other Units	Students use a number line and a subtraction statement (end time – start time = elapsed time [borrowing may be necessary]) to determine the amount of time which passes between two events. Complete I41.
I42 – Temperature Changes	Students use thermometer pictures to determine the change of temperatures. Complete I42.
I45 – More Perimeter	Students use drawings and formulas to determine the perimeter of a shape. Complete I45.
I46 – Area of Rectangles and Squares	Students use drawings and formulas to determine the area of rectangles and squares. Complete I46.
I47 – Area of Irregular Figures	Students divide a shape into squares and rectangles, find the area of the smaller pieces, and add the areas together to find the area of an irregular figure. Complete I47.
I48 – Rectangles with the Same Area or Perimeter	Students use grid paper to show different ways to make shapes with the same area or perimeter. Complete I48.
I49 – Area of Parallelograms	Students use drawings and the formula $A=bh$ to find the area of parallelograms. Complete I49.
I50 – Area of Triangles	Students use drawings and the formula $A=1/2bh$ to find the area of triangles. Complete I50.
I51 – Circumference	Students use a formula to find the circumference of different

	circles. Complete I51.
I52 – Area of a Circle	Students use a formula to find the area of different circles. Complete I52.
I53 – Surface Area of Rectangular Prisms	Students break drawings of rectangular prism into the separate rectangles. They find the areas of the smaller parts and add them together. Complete I53.
I54 – Surface Area	Students use a variety of strategies to find the surface area of cylinders, square pyramids, and triangular prisms. Complete I54.
I56 – Measuring Volume	Students use drawings and the formula $V=lwh$ to find the volume of rectangular prisms. Complete I56.
I57 – Volume of Triangular Prisms and Cylinders	Students use drawings and formulas to find the volume of triangular prisms and cylinders. Complete I57.
I58 – Comparing Volume and Surface Area	Students use unit cubes to make shapes and compare their volumes and surface areas. Complete I58.
I61 – Reading and Making a Bar Graph	Students use data to create a bar graph and then answer questions related to the graph. Complete I61.
I63 – Interpreting Graphs	Students use bar graphs to answer questions. Complete I63.
I64 – Reading and Making Line Graphs	Students use data to create a line graph and then answer questions related to the graph. Complete I64.
I65 – Stem-and-Leaf Plots	Students use data to create stem-and-leaf plots and then answer questions related to the graph. Complete I65.
I66 – Circle Graphs	Students are guided to figure out how to read and interpret the data represented on circle graphs. Complete I66.
I67 – Making and Reading Circle Graphs	Students use data to create a circle graph and then answer questions related to the graph. Complete I67.
I68 – Histograms	Students are guided to figure out how to read and interpret the data represented on histograms. Complete I68.
I69 – Choosing Appropriate Graphs	Students review the purpose behind different graphs and choose the correct one to represent different situations. Complete I69.
I70 – Double Bar Graphs	Students use data to create a double bar graph and then answer questions related to the graph. Complete I70.
I71 – Finding the Mean	Students use color tiles to demonstrate finding the mean of three numbers. Complete I71.
I72 – Median, Mode, and Range	Students put color tiles or counters in a clear container and guess how many. Guesses are recorded and used to find the median, mode, and range. Complete I72.
I73 – Sampling Methods	Students discuss the difference between a population and sample. Complete I73.
I74 – Using Statistics	Students discover ways in which statistics can be used to help a certain position. Complete I74.
I79 – Probability as a Fraction	Students practice writing probability as a fraction by writing the number of favorable outcomes over the number of possible outcomes. Complete I79.
I80 – Outcomes and Tree Diagrams	Students create combination trees to find all of the possible outcomes. Complete I80.

I81 – Finding Combinations	Students create a table to list all of the possible outcomes. Complete I81.
I82 – Predictions and Probability	Students use the data from a sample to make predictions about a larger population. Complete I82.
I83 – Counting Methods	Students create combination trees to find all of the possible outcomes. Complete I83.
I84 – Permutations and Combinations	Students use a table to list all of the possible outcomes. Complete I84.
I85 – Representing Probability	Students practice writing probability as a fraction by writing the number of favorable outcomes over the number of possible outcomes. Complete I85.
I86 – Experimental Probability and Predictions	Students use color tiles to create a sampling experiment and find the probability of certain outcomes. Complete I86.
Resources	
<b>Student Resources:</b> <ul style="list-style-type: none"> <li>• Coin Manipulatives</li> <li>• Analog Clock</li> <li>• Measuring Tools (paperclips, snap cubes, rulers with inches and centimeters, yardsticks, cups, thermometers, etc.)</li> </ul>	
<b>Teacher Resources:</b> <ul style="list-style-type: none"> <li>• Math Diagnosis and Intervention System (Pearson Education, Inc.)</li> </ul>	

Unit Overview
<p><b>Content Area:</b> Basic Skills – Math</p>
<p><b>Unit Title:</b> Geometry</p>
<p><b>Grade Level:</b> Kindergarten to Fifth Grade</p>
<p><b>Unit Summary:</b> In this unit, students identify and describe shapes, reason with shapes and their attributes, draw and identify lines and angles, classify shapes based on their properties, and graph coordinate pairs. Students move through this unit based on their needs identified in MAP testing and diagnostic assessments. They do not complete each lesson.</p>
Learning Targets
<p><b>Common Core Standards:</b></p> <ul style="list-style-type: none"> <li>• K.G.A.1 Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind, and next to.</li> <li>• K.G.A.2 Correctly name shapes regardless of their orientations or overall size.</li> <li>• K.G.A.3 Identify shapes as two-dimensional (lying in a plane, “flat”) or three-dimensional (“solid”).</li> <li>• K.G.B.4 Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/”corners”) and other attributes (e.g., have sides of equal lengths).</li> <li>• K.G.B.5 Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.</li> <li>• K.G.B.6 Compose simple shapes to form larger shapes. For example, “Can you join these two triangles with full sides touching to make a rectangle?”</li> <li>• 1.G.A.1 Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.</li> <li>• 1.G.A.2 Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.</li> <li>• 1.G.A.3 Partition circles and rectangles into two and four equal shares, describe the shares using the words halves, fourths, and quarters, and use the phrases half of, fourth of, and quarter of. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.</li> <li>• 2.G.A.1 Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.</li> <li>• 2.G.A.2 Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.</li> <li>• 2.G.A.3 Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.</li> </ul>

- 3.G.A.1 Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.
- 3.G.A.2 Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal areas, and describe the area of each part as  $\frac{1}{4}$  of the area of the shape.
- 4.G.A.1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
- 4.G.A.2 Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.
- 4.G.A.3 Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.
- 5.G.A.1 Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).
- 5.G.A.2 Represent real world mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.
- 5.G.B.3 Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares have four right angles.
- 5.G.B.4 Classify two-dimensional figures in a hierarchy based on properties.

**Unit Essential Questions:**

- What are properties of circles, squares, rectangles, triangles, etc.?
- What is symmetry?
- What are solid figures?
- How are points plotted on a coordinate grid?

**Unit Enduring Understandings:**

- Shapes have different properties which can be used for classification purposes.

**Unit Learning Targets:**

*Students will...*

- Break geometric shapes into equal parts.
- Find lines of symmetry.
- Sort and classify shapes based on their properties.
- Match congruent shapes.
- Label geometric terms.
- Plot ordered pairs on a grid.

**Evidence of Learning**

**Assessments:**

- Completed assignments

- Progress monitoring of skills
- Observation

Lesson Plans

Lesson Number and Title	Lesson Description
A34 – Halves	Students use snap cubes to make trains with equal numbers of two different colors and use half to describe. Complete A34.
A35 – Equal Parts	Students use color tiles to break shapes into equal parts. Complete A35.
A36 – Understanding Fractions to Fourths	Students identify shapes which have been divided into equal parts. Complete A36.
A37 – Fractions of a Set	Students color parts of a set of objects. Complete A37.
A38 – Writing Fractions for Part of a Region	Students identify how many parts of a shape are shaded and how many parts in total. Complete A38.
A39 – Writing Fractions for a Part of a Set	Students describe a set of objects using fractions (e.g., $\frac{3}{4}$ are red). Complete A39.
A40 – Estimating Fractions	Students determine if part of an object is close to 0, $\frac{1}{2}$ , or 1. Complete A40.
A41 – Understanding One as a Fraction	Students show 1 whole using fractional parts. Complete A41.
D47 – Position and Location	Students use positional words (over, under, next to, etc.) to describe the location of different objects. Complete D47.
D48 – Shapes	Students identify shapes in different pictures. Complete D48.
D49 – Solid Figures	Students identify solid figures and sort them by similar properties (e.g., cylinders and spheres roll). Complete D49.
D50 – Flat Surfaces of Solid Figures	Students identify the number of flat surfaces on solid figures. Complete D50.
D51 – Properties of Plane Shapes	Students sort plane figures based on their properties (number of sides, angles, etc.). Complete D51.
D52 – Making New Shapes from Shapes	Students use pattern blocks to show different ways to replicate shapes. Complete D52.
D53 – Cutting Shapes Apart	Students demonstrate ways to cut shapes to make new shapes. Complete D53.
D54 – Same Size, Same Shape	Students cut and turn two shapes to determine if they are congruent. Complete D54.
D55 – Ways to Move Shapes	Students flip, turn, and slide shapes to show the different ways the shapes can look. Complete D55.
D56 – Symmetry	Students fold shapes in half to determine whether or not they are symmetrical. Complete D56.
D57 – Flat Surfaces and Corners	Students classify shapes based on the number of flat surfaces and corners. Complete D57.
D58 – Faces, Corners, and Edges	Students classify shapes based on the number of flat surfaces, edges, and vertices. Complete D58.
D59 – Solid Figures	Students classify shapes based on the number of flat surfaces, edges, and vertices, and the shapes of the faces. Complete D59.
D60 – Breaking Apart Solids	Students explore the way solid figures would look if they were

	cut. Complete D60.
D61 – Lines and Line Segments	Students draw examples of different types of lines. Complete D61.
D62 – Acute, Right, and Obtuse Angles	Students sort and classify angles based on their measurement. Complete D62.
D63 – Polygons	Students sort and classify polygons based on the number of sides and vertices. Complete D63.
D64 – Classifying Triangles Using Sides and Angles	Students create a reference book to define the types of angles and triangles. Complete D64.
D65 – Quadrilaterals	Students sort and classify shapes with four sides. Complete D65.
D66 – Congruent Figures and Motions	Students experiment with making congruent shapes, and then flipping, sliding, and turning those shapes. Complete D66.
D67 – Line Symmetry	Students fold shapes in half to determine whether or not they are symmetrical. Complete D67.
D68 – Sorting and Classifying	Students will sort and classify shapes based on rules they determine. Complete D68.
D76 – Locations on a Grid	Students give directions using a grid. Complete D76.
D81 – Graphing Ordered Pairs	Students use ordered pairs to find points on a grid. Complete D81.
F30 – Graphing Ordered Pairs	Students use ordered pairs to find points on a grid. Complete F30.
F31 – Lengths of Line Segments	Students plot points on a grid and give the length of the segments that were created. Complete F31.
F32 – Graphing Equations	Students solve equations with different variables and then plot the points on a graph. Complete F32.
F33 – Graphing Points in the Coordinate Plane	Students use positive and negative ordered pairs to plot points. Complete F33.
F34 – Graphing Equations in the Coordinate Plane	Students solve equations with positive and negative variables to plot points. Complete F34.
I9 – Line Symmetry	Students find the lines of symmetry on different shapes. Complete I9.
I10 – Solids and Nets	Students use nets to find the faces, edges, and vertices of different solid shapes. Complete I10.
I11 – Views of Solid Figures	Students make a 3D shape and then draw them in 2D. Complete I11.
I12 – Geometric Ideas	Students use a diagram to identify points, lines, segments, rays, angles, vertex, parallel lines, intersecting lines, and perpendicular lines. Complete I12.
I13 – Congruent Figures	Students examine two shapes and determine whether they are congruent. Complete I13.
I14 – Circles	Students use a diagram to identify the center, radius, chord, and diameter. Complete I14.
I15 – Rotational Symmetry	Students find the rotational symmetry of different shapes. Complete I15.
I16 – Transformations	Students use coordinate grids to reflect, rotate, and translate shapes. Complete I16.

Resources
<b>Student Resources:</b> <ul style="list-style-type: none"><li>• Solid Figures</li><li>• Pattern Blocks</li></ul>
<b>Teacher Resources:</b> <ul style="list-style-type: none"><li>• Math Diagnosis and Intervention System (Pearson Education, Inc.)</li></ul>