

# 3rd Grade Mathematics 2022-2023



Units of Instruction

# 3rd Grade Mathematics

<b>Unit 1</b> <b>Adding and Subtracting to Solve Problems</b>  <b>25 Days</b>	<b>Unit 2</b> <b>Multiplication as Equal Groups</b>  <b>25 Days</b>	<b>Unit 3</b> <b>Multiplication and Area</b>  <b>25 Days</b>	<b>Unit 4</b> <b>Multiplication and Division</b>  <b>25 Days</b>	<b>Unit 5</b> <b>Solving Problems about Measurement</b>  <b>25 Days</b>	<b>Unit 6</b> <b>Fractions as Numbers</b>  <b>27 Days</b>	<b>Unit 7:</b> <b>Data and Fractions</b>  <b>20 Days</b>
3.NBT.2 3.MD.1  3.NBT.1	3.OA.1 3.OA.2 3.OA.3 3.OA.7  3.MD.3 3.OA.5 3.OA.9	3.OA.2 3.OA.7 3.MD.5  3.MD.6 3.MD.7 3.NBT.3 3.OA.5	3.OA.6 3.OA.7  3.OA.4 3.OA.5 3.OA.9	3.OA.7 3.OA.8 3.NBT.2  3.MD.2 3.MD.7 3.MD.8 3.G.1	3.NF.1 3.NF.2 3.NF.3  3.G.2	3.NF.2  3.MD.4
<b>Fluency Standards (taught all year long):</b> 3.OA.7, 3.NBT.2						

Priority Standards: 3.OA.1, 3.OA.2, 3.OA.3, 3.OA.6, 3.OA.7, 3.OA.8, 3.NF.1, 3.NF.2, 3.NF.3, 3.MD.1, 3.MD.5, 3.NBT.2

# 3rd Grade Mathematics



Unit 1: Adding and Subtracting: Solving Problems

## Grade 3 Mathematics

### Unit 1: Adding and Subtracting: Solving Problems

This unit focuses on extending students' fluency with addition and subtraction strategies from previous grades. They represent numbers on a number line and use place value to round numbers. They use their understanding to apply strategies to problems involving elapsed time.

**Duration: 25 Days**

<i>Standards for Mathematical Practice</i>	
MP.1. Make sense of problems and persevere in solving them. MP.2. Reason abstractly and quantitatively. MP.3. Construct viable arguments and critique the reasoning of others. MP.4. Model with mathematics.	MP.5. Use appropriate tools strategically. MP.6. Attend to precision. MP.7. Look for and make use of structure. MP.8. Look for and express regularity in repeated reasoning.
<i>Priority Standards</i>	
Standards	Clarifications
<p><b>Cluster: Use place value understanding and properties of operations to perform multi-digit arithmetic. Note: A range of algorithms may be used.</b></p> <p><b>KY.3.NBT.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.</b></p> <p>MP.2, MP.3</p>	<p>Students determine addition and subtraction strategies efficiently, accurately, flexibly and appropriately. Being fluent means students are able to choose flexibly among methods and strategies to solve contextual and mathematical problems, they understand and are able to explain their approaches and they are able to produce accurate answers efficiently.</p> <p>Note: Reaching fluency is an ongoing process that will take much of the year.</p> <p style="text-align: center;"><b>KY.2.NBT.5</b></p> <p><b>Coherence KY.2.NBT.7→KY.3.NBT.2→ KY.4.NBT4</b></p>

**Cluster: Solve problems involving measurement and estimation of intervals of time, liquid volumes and masses of objects.**

**KY.3.MD.1 Tell and write time to the nearest minute and measure elapsed time intervals in minutes. Solve word problems involving addition and subtraction of time intervals within and across the hour in minutes.**

MP.4, MP.6, MP.1, MP.4

Students solve elapsed time problems using strategies and tools such as clock models and number lines (seeing a clock as a number line).

**Coherence KY.2.MD.7→KY.3.MD.1→ KY.4.MD.2**

### *Supporting Standards*

#### **Standards**

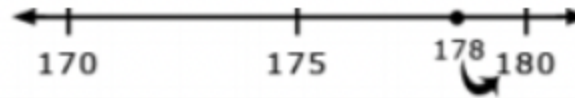
**Cluster: Use place value understanding and properties of operations to perform multi-digit arithmetic. Note: A range of algorithms may be used.**

**KY.3.NBT.1 Use place value understanding to round whole numbers to the nearest 10 or 100.**

MP.7

#### **Clarifications**

On a number line, students determine 178 rounded to nearest 10 is 180.



**Coherence KY.2.NBT.1→KY.3.NBT.1→ KY.4.NBT.3**

# 3rd Grade Mathematics



## Unit 2: Multiplication as Equal Groups

## 3rd Grade Mathematics

### Unit 2: Multiplication as Equal groups

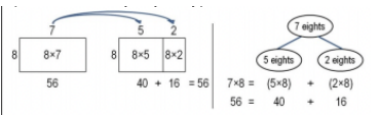
This unit builds on students' understanding of equal groups and shares (from second grade) to define multiplication as an operation. They look for patterns in arithmetic tables to identify properties of the operation and use this to develop strategies. They consider and create scaled data displays in order to answer statistical questions involving categorical data.

**Duration: 30 Days**

<i>Standards for Mathematical Practice</i>	
MP.1. Make sense of problems and persevere in solving them. MP.2. Reason abstractly and quantitatively. MP.3. Construct viable arguments and critique the reasoning of others. MP.4. Model with mathematics.	MP.5. Use appropriate tools strategically. MP.6. Attend to precision. MP.7. Look for and make use of structure. MP.8. Look for and express regularity in repeated reasoning.
<i>Priority Standards</i>	
Standards	Clarifications
<p><b>Cluster: Represent and solve problems involving multiplication and division.</b></p> <p><b>KY.3.OA.1 Interpret and demonstrate products of whole numbers.</b></p> <p>MP.2, MP.5</p>	<p>Students use models for multiplication situations. For example, students interpret <math>5 \times 7</math> as the total number of objects in 5 groups of 7 objects each.</p> <p><b>Coherence KY.2.OA.4→KY.3.OA.1→KY.4.OA.1</b></p>
<p><b>Cluster: Represent and solve problems involving multiplication and division.</b></p>	<p>Students use models for division situations. For example, students interpret <math>56 \div 8</math> as the number of 56 objects are partitioned equally into 8 shares, or as a number of</p>

<p><b>KY.3.OA.2 Interpret and demonstrate whole-number quotients of whole numbers, where objects are partitioned into equal shares.</b></p> <p>MP.2, MP.5</p>	<p>shares when 56 objects are partitioned into equal shares of 8 object each.</p> <p><b>Coherence KY.3.OA.1→KY.3.OA.2→KY.5.NF.3</b></p>
<p><b>Cluster: Represent and solve problems involving multiplication and division.</b></p> <p><b>KY.3.OA.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays and measurement quantities, by using drawings and equations with a symbol for the unknown number to represent the problem.</b></p> <p>MP.1, MP.4</p>	<p>Students flexibly model or represent multiplication and division situations or context problems (involving products and quotients up to 100). Note: Drawings need not show detail, but accurately represent the quantities involved in the task. See Table 2 in Appendix A.</p> <p><b>Coherence KY.3.OA.3→KY.4.OA.2</b></p>
<p><b>Cluster: Multiply and divide within 100.</b></p> <p><b>KY.3.OA.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division or properties of operations.</b></p> <p>MP.2, MP.8</p>	<p>Students determine multiplication and division strategies efficiently, accurately, flexibly and appropriately. Being fluent means students choose flexibly among methods and strategies to solve contextual and mathematical problems, they understand and explain their approaches and they produce accurate answers efficiently. Knowing <math>8 \times 5 = 40</math>, one knows <math>40 \div 5 = 8</math>. Note: Reaching fluency is an ongoing process that will take much of the year.</p> <p><b>Coherence KY.3.OA.7→KY.4.OA.4</b></p>
<p><b><i>Supporting Standards</i></b></p>	



Standards	Clarifications
<p><b>Cluster: Understand and apply the statistics process.</b></p> <p><b>KY.3.MD.3 Investigate questions involving categorical data.</b></p> <p><b>a. Identify a statistical question focused on categorical data and gather data;</b></p> <p><b>b. Create a scaled pictograph and a scaled bar graph to represent a data set (using technology or by hand);</b></p> <p><b>c. Make observations from the graph about the question posed, including “how many more” and “how many less” questions.</b></p> <p>MP.3, MP.5, MP.6</p>	<p>Students select a question of interest (how many pets does each classmate have), gather data and create a bar graph (each square in the bar graph might represent 2 pets).</p> <p><b>Coherence KY.2.MD.10→KY.3.MD.3</b></p>
<p><b>Cluster: Understand properties of multiplication and the relationship between multiplication and division.</b></p> <p><b>KY.3.OA.5 Apply properties of operations as strategies to multiply and divide.</b></p> <p>MP.3, MP.4</p>	<p>Students need not use formal terms for these properties. If <math>6 \times 4</math> is known, then <math>4 \times 6 = 24</math> is also known (Commutative property of multiplication). <math>3 \times 5 \times 2</math> can be found by <math>3 \times 5 = 15</math>, then <math>15 \times 2 = 30</math>, or by <math>5 \times 2 = 10</math>, then <math>3 \times 10 = 30</math> (Associative property of multiplication). Knowing that <math>8 \times 5 = 40</math> and <math>8 \times 2 = 16</math>, one can find <math>8 \times 7</math> as <math>8 \times (5+2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56</math> (Distributive property).</p>  <p><b>KY.4.NBT.5</b></p> <p><b>Coherence KY.3.OA.5→KY.4.NBT.6</b></p>

**Cluster: Solve problems involving the four operations and identify and explain patterns in arithmetic.**

**KY.3.OA.9 Identify arithmetic patterns (including patterns in the addition table or multiplication table) and explain them using properties of operations.**

MP.3, MP.8

Students observe 4 times a number is always even and explain why 4 times a number can be decomposed into two equal addends.

Coherence KY.2.OA.3→KY.3.OA.9→ KY.4.OA.5

# 3rd Grade Mathematics



## Unit 3: Multiplication and Area

## 3rd Grade Mathematics

### Unit 3: Multiplication and Area

**This unit focuses on deepening students' understanding and fluency with multiplication. Students extend their thinking from multiplication as equal groups and shares. By relating properties of multiplication to properties of area, students expand their strategies for solving multiplication problems.**

**Duration: 25 Days**

<b><i>Standards for Mathematical Practice</i></b>	
MP.1. Make sense of problems and persevere in solving them. MP.2. Reason abstractly and quantitatively. MP.3. Construct viable arguments and critique the reasoning of others. MP.4. Model with mathematics.	MP.5. Use appropriate tools strategically. MP.6. Attend to precision. MP.7. Look for and make use of structure. MP.8. Look for and express regularity in repeated reasoning.
<b><i>Priority Standards</i></b>	
<b>Standards</b>	<b>Clarifications</b>
<b>Cluster: Represent and solve problems involving multiplication and division.</b>  <b>KY.3.OA.2 Interpret and demonstrate whole-number quotients of whole numbers, where objects are partitioned into equal shares.</b>  MP.2, MP.5	Students use models for division situations. For example, students interpret $56 \div 8$ as the number of 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 object each.  <b>Coherence KY.3.OA.1→KY.3.OA.2→KY.5.NF.3</b>
<b>Cluster: Multiply and divide within 100.</b>	Students determine multiplication and division strategies efficiently, accurately, flexibly and

**KY.3.OA.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division or properties of operations.**

MP.2, MP.8

appropriately. Being fluent means students choose flexibly among methods and strategies to solve contextual and mathematical problems, they understand and explain their approaches and they produce accurate answers efficiently. Knowing  $8 \times 5 = 40$ , one knows  $40 \div 5 = 8$ .

Note: Reaching fluency is an ongoing process that will take much of the year.

**Coherence KY.3.OA.7→KY.4.OA.4**

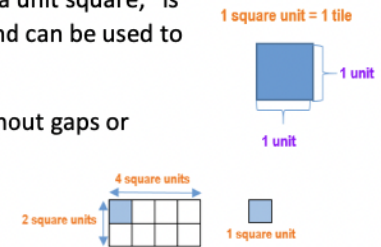
**Cluster: Geometric measurement: understanding concepts of area and relate area to multiplication and to addition.**

**KY.3.MD.5 Recognize area as an attribute of plane figures and understand concepts of area measurement.**

MP.5

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.

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.



**Coherence KY.3.MD.5→KY.5.MD.3**

### *Supporting Standards*

**Standards**

**Clarifications**

**Cluster: Geometric measurement: understanding concepts of area and relate area to multiplication and to addition.**

**KY.3.MD.6 Measure areas by counting unit squares (square cm, square m, square in, square ft. and improvised units).**

MP.5, MP.6

Students use grid paper of varying square units to count the number of unit squares in a figure.

**Coherence KY.2.G.2→KY.3.MD.6→KY.5.MD.4**

**Cluster: Geometric measurement: understanding concepts of area and relate area to multiplication and to addition.**

**KY.3.MD.7 Relate area to the operations of multiplication and addition.**

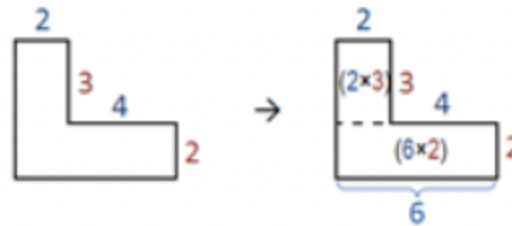
**a. Find the area of a rectangle with whole-number side lengths by tiling it and show the area is the same as would be found by multiplying the side lengths.**

**b. Multiply side lengths to find areas of rectangles with whole- number side lengths in the context of solving real world and mathematical problems and represent whole-number products as rectangular areas in mathematical reasoning.**

**c. Use tiling to show in a concrete case the area of a rectangle with whole-number side lengths  $a$  and  $b + c$  is the sum of  $a \times b$  and  $a \times c$ . Use area models to represent the distributive property in mathematical reasoning.**

**d. Recognize area as additive. Find areas of figures that can be**

d.



**Coherence KY.3.MD.7→KY.4.MD.3→ KY.5.MD.5**

**decomposed into non-overlapping rectangles by adding the areas of the non-overlapping parts, applying this technique to solve real world problems.**

MP.1, MP.8

**Cluster: Use place value understanding and properties of operations to perform multi-digit arithmetic. Note: A range of algorithms may be used.**

**KY.3.NBT.3 Multiply one-digit whole numbers by multiples of 10 in the range of 10–90 using strategies based on place value and properties of operations.**

MP.7, MP.8

**Cluster: Understand properties of multiplication and the relationship between multiplication and division.**

**KY.3.OA.5 Apply properties of operations as strategies to multiply and divide.**

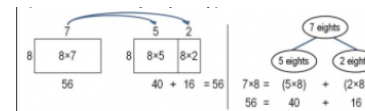
MP.3, MP.4

To solve  $8 \times 60$ , students interpret this as 8 groups of 6 tens, which is 480.

**KY.3.OA.5**

**Coherence KY.2.NBT.1→KY.3.NBT.3→ KY.4.NBT.5**

Students need not use formal terms for these properties. If  $6 \times 4$  is known, then  $4 \times 6 = 24$  is also known (Commutative property of multiplication).  $3 \times 5 \times 2$  can be found by  $3 \times 5 = 15$ , then  $15 \times 2 = 30$ , or by  $5 \times 2 = 10$ , then  $3 \times 10 = 30$  (Associative property of multiplication). Knowing that  $8 \times 5 = 40$  and  $8 \times 2 = 16$ , one can find  $8 \times 7$  as  $8 \times (5+2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$  (Distributive property).



**KY.4.NBT.5**

**Coherence KY.3.OA.5→KY.4.NBT.6**



# 3rd Grade Mathematics



## Unit 4: Multiplication and Division

## 3rd Grade Mathematics

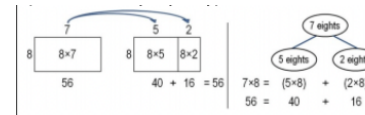
### Unit 4: Multiplication and Division

**This unit builds on students' understanding of multiplication from earlier units to develop an understanding of division as an unknown-factor problem. They use this relationship and patterns of arithmetic to develop strategies for division and solve division problems.**

**Duration: 25 days**

<i>Standards for Mathematical Practice</i>	
MP.1. Make sense of problems and persevere in solving them. MP.2. Reason abstractly and quantitatively. MP.3. Construct viable arguments and critique the reasoning of others. MP.4. Model with mathematics.	MP.5. Use appropriate tools strategically. MP.6. Attend to precision. MP.7. Look for and make use of structure. MP.8. Look for and express regularity in repeated reasoning.
<i>Priority Standards</i>	
Standards	Clarifications
<p><b>Cluster: Understand properties of multiplication and the relationship between multiplication and division.</b></p> <p><b>KY.3.OA.6 Understand division as an unknown-factor problem.</b></p> <p>MP.2</p>	<p>Find <math>32 \div 8</math> by finding the number that makes 32 when multiplied by 8.</p> <p><b>Coherence KY.3.OA.6→KY.4.NBT.6</b></p>
<p><b>Cluster: Multiply and divide within 100.</b></p>	<p>Students determine multiplication and division</p>

<p><b>KY.3.OA.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division or properties of operations.</b></p> <p>MP.2, MP.8</p>	<p>strategies efficiently, accurately, flexibly and appropriately. Being fluent means students choose flexibly among methods and strategies to solve contextual and mathematical problems, they understand and explain their approaches and they produce accurate answers efficiently. Knowing <math>8 \times 5 = 40</math>, one knows <math>40 \div 5 = 8</math>.</p> <p>Note: Reaching fluency is an ongoing process that will take much of the year.</p> <p><b>Coherence KY.3.OA.7→KY.4.OA.4</b></p>
<p><b><i>Supporting Standards</i></b></p>	
<p><b>Standards</b></p>	<p><b>Clarifications</b></p>
<p><b>Cluster: Represent and solve problems involving multiplication and division.</b></p> <p><b>KY.3.OA.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers.</b></p> <p>MP.6, MP.7</p>	<p>Students determine the unknown number that makes the equation true in each of the equations <math>8 \times ? = 48</math>, <math>5 = \square \div 3</math>, <math>6 \times 6 = ?</math>.</p> <p><b>Coherence KY.3.OA.4→KY.4.MD.3</b></p>
<p><b>Cluster: Understand properties of multiplication and the relationship between multiplication and division.</b></p> <p><b>KY.3.OA.5 Apply properties of operations as strategies to multiply and divide.</b></p> <p>MP.3, MP.4</p>	<p>Students need not use formal terms for these properties. If <math>6 \times 4</math> is known, then <math>4 \times 6 = 24</math> is also known (Commutative property of multiplication). <math>3 \times 5 \times 2</math> can be found by <math>3 \times 5 = 15</math>, then <math>15 \times 2 = 30</math>, or by <math>5 \times 2 = 10</math>, then <math>3 \times 10 = 30</math> (Associative property of multiplication). Knowing that <math>8 \times 5 = 40</math> and <math>8 \times 2 = 16</math>, one can find <math>8 \times 7</math> as <math>8 \times (5+2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56</math> (Distributive property).</p>



**KY.4.NBT.5**  
**Coherence KY.3.OA.5→KY.4.NBT.6**

**Cluster: Solve problems involving the four operations and identify and explain patterns in arithmetic.**

**KY.3.OA.9 Identify arithmetic patterns (including patterns in the addition table or multiplication table) and explain them using properties of operations.**

MP.3, MP.8

Students observe 4 times a number is always even and explain why 4 times a number can be decomposed into two equal addends.

**Coherence KY.2.OA.3→KY.3.OA.9→ KY.4.OA.5**

# 3rd Grade Mathematics



## Unit 5: Solving Problems involving Measurement

## 3rd Grade Mathematics

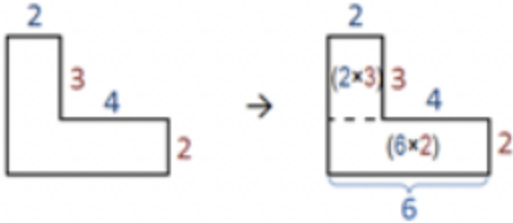
### Unit 5: Solving Problems involving Measurement

This unit focuses on problem solving in measurement and geometric situations. Students consider attributes and relationships among polygons. They solve problems involving area and perimeter, relating these properties of figures to the properties of multiplication and addition. They further deepen their fluency by solving problems in the context of mass and liquid volume.

**Duration: 25 Days**

<i>Standards for Mathematical Practice</i>	
MP.1. Make sense of problems and persevere in solving them. MP.2. Reason abstractly and quantitatively. MP.3. Construct viable arguments and critique the reasoning of others. MP.4. Model with mathematics.	MP.5. Use appropriate tools strategically. MP.6. Attend to precision. MP.7. Look for and make use of structure. MP.8. Look for and express regularity in repeated reasoning.
<i>Priority Standards</i>	
Standards	Clarifications
<p><b>Cluster: Multiply and divide within 100.</b></p> <p><b>KY.3.OA.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division or properties of operations.</b></p> <p>MP.2, MP.8</p>	<p>Students determine multiplication and division strategies efficiently, accurately, flexibly and appropriately. Being fluent means students choose flexibly among methods and strategies to solve contextual and mathematical problems, they understand and explain their approaches and they produce accurate answers efficiently. Knowing <math>8 \times 5 = 40</math>, one knows <math>40 \div 5 = 8</math>.</p> <p>Note: Reaching fluency is an ongoing process that will take much of the year.</p>

	<p><b>Coherence KY.3.OA.7→KY.4.OA.4</b></p>
<p><b>Cluster: Solve problems involving the four operations and identify and explain patterns in arithmetic.</b></p> <p><b>KY.3.OA.8 Use various strategies to solve two-step word problems using the four operations (involving only whole numbers with whole number answers). 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.</b></p> <p>MP.1, MP.4</p>	<p>Students solve problems using models, pictures, words and numbers. Students explain how they solved the problem using accurate mathematical vocabulary and why their answer makes sense.</p> <p>Note: Estimation skills include identifying when estimation is appropriate, determining method of estimation and verifying solutions or determining the reasonableness of situations using various estimation strategies. The skill of estimating within context allows students to further develop their number sense.</p> <p><b>Coherence KY.2.OA.1→KY.3.OA.8→ KY.4.OA.3</b></p>
<p><b>Cluster: Use place value understanding and properties of operations to perform multi-digit arithmetic. Note: A range of algorithms may be used.</b></p> <p><b>KY.3.NBT.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.</b></p> <p>MP.2, MP.3</p>	<p>Students determine addition and subtraction strategies efficiently, accurately, flexibly and appropriately. Being fluent means students are able to choose flexibly among methods and strategies to solve contextual and mathematical problems, they understand and are able to explain their approaches and they are able to produce accurate answers efficiently.</p> <p>Note: Reaching fluency is an ongoing process that will take much of the year.</p> <p><b>KY.2.NBT.5</b>  <b>Coherence KY.2.NBT.7→KY.3.NBT.2→ KY.4.NBT4</b></p>
<p style="text-align: center;"><b><i>Supporting Standards</i></b></p>	

Standards	Clarifications
<p><b>Cluster: Solve problems involving measurement and estimation of intervals of time, liquid volumes and masses of objects.</b></p> <p><b>KY.3.MD.2 Measure and solve problems involving mass and liquid volume.</b></p> <p>a. Measure and estimate masses and liquid volumes of objects using standard units of grams (g), kilograms (kg) and liters (L).</p> <p>b. Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units.</p> <p>MP.1, MP.6</p>	<p>a. Students have multiple opportunities to weigh classroom objects and fill containers to help them develop a basic understanding of the size and weight of a liter, a gram and a kilogram.</p> <p>b. See Table 2 in Appendix A.</p> <p><b>Coherence KY.2.MD.5→KY.3.MD.2→KY.4.MD.1</b></p>
<p><b>Cluster: Geometric measurement: understanding concepts of area and relate area to multiplication and to addition.</b></p> <p><b>KY.3.MD.7 Relate area to the operations of multiplication and addition.</b></p> <p>a. Find the area of a rectangle with whole-number side lengths by tiling it and show the area is the same as would be found by multiplying the side lengths.</p> <p>b. Multiply side lengths to find areas of rectangles with whole- number side lengths in the context of solving real world and mathematical problems and represent whole-number products as rectangular areas in mathematical reasoning.</p> <p>c. Use tiling to show in a concrete case the area</p>	<p>d.</p>  <p><b>Coherence KY.3.MD.7→KY.4.MD.3→ KY.5.MD.5</b></p>



of a rectangle with whole-number side lengths  $a$  and  $b + c$  is the sum of  $a \times b$  and  $a \times c$ . Use area models to represent the distributive property in mathematical reasoning.

d. Recognize area as additive. Find areas of figures that can be decomposed into non-overlapping rectangles by adding the areas of the non-overlapping parts, applying this technique to solve real world problems.

MP.1, MP.8

**Cluster: Geometric measurement: Recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.**

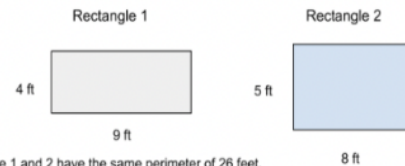
**KY.3.MD.8 Solve real world and mathematical problems involving perimeters of polygons.**

- a. Find the perimeter given the side lengths of a polygon.
- b. Find an unknown side length, given the perimeter and some lengths.
- c. Draw rectangles with the same perimeter and different areas or with the same area and different perimeters. MP.1,

MP.4

C.

**Rectangles with the Same Perimeter but Different Areas**



Rectangle 1 and 2 have the same perimeter of 26 feet. Rectangle 1 has an area of 36 sq. ft, while Rectangle 2 has an area of 40 sq. ft.

**Rectangles with Different Perimeters, but Same Area**



Rectangle 1 and 2 have the same area of 24 sq. feet. Rectangle 1 has a perimeter of 20 ft., while Rectangle 2 has a perimeter of 28 ft.

**Coherence KY.3.MD.8→KY.4.MD.3**

**Cluster: Reason with shapes and their attributes.**

**KY.3.G.1 Classify polygons by attributes.**

- a. Recognize and classify polygons based on the

Students describe, analyze and compare properties of two-dimensional shapes.

**Coherence KY.2.G.1→KY.3.G.1→KY.4.G.2**

**number of sides and vertices (triangles, quadrilaterals, pentagons and hexagons).**

**b. Recognize and classify quadrilaterals (rectangles, squares, parallelograms, rhombuses, trapezoids) by side lengths and understanding shapes in different categories may share attributes and the shared attributes can define a larger category.**

**c. Identify shapes that do not belong to a given category or subcategory.**

MP.6, MP.7

# 3rd Grade Mathematics



## Unit 6: Fractions as Numbers

## 3rd Grade Mathematics

### Unit 6: Fractions as Numbers

This unit builds on students' understanding of partitioning to develop their understanding of fractions as numbers. They consider the relationships between a whole and a unit fraction and record these relationships with numerals and number lines. They extend these skills to non-unit fractions through iterating unit fractions. They compare fractions using many different visual representations and can explain what it means for fractions to be equivalent. In 3rd grade, students should work with fractions with denominators 2,3,4,6 and 8.

**Duration: 30 Days**

<i>Standards for Mathematical Practice</i>	
MP.1. Make sense of problems and persevere in solving them. MP.2. Reason abstractly and quantitatively. MP.3. Construct viable arguments and critique the reasoning of others. MP.4. Model with mathematics.	MP.5. Use appropriate tools strategically. MP.6. Attend to precision. MP.7. Look for and make use of structure. MP.8. Look for and express regularity in repeated reasoning.
<i>Priority Standards</i>	
Standards	Clarifications
<p><b>Cluster: Develop understanding of fractions as numbers. Note: grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6 and 8.</b></p> <p><b>KY.3.NF.1 Understand a fraction <math>\frac{1}{b}</math> as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a</b></p>	<p>Students name parts of the whole using fractions and explain the fraction is made up of unit fractions. Students describe the numerator and the denominator using pictures, numbers and words.</p> $\frac{4}{6} = \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6}$ <p>Note: grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6 and 8.</p>

**fraction  $a/b$   
as the quantity formed by a parts of size  $b$ .**

MP.2, MP.7

**Cluster: Develop understanding of fractions as numbers. Note: grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6 and 8.**

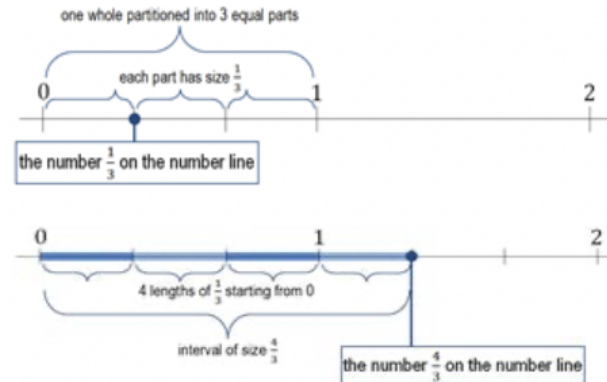
**KY.3.NF.2 Understand a fraction as a number on the number line; represent fractions on a number line.**

**a. Represent a fraction  $1/b$  (unit fraction) on a number line by defining the interval from 0 to 1 as the whole and partitioning it into  $b$  equal parts.**

- Recognize each part has size  $1/b$ .
- a unit fraction,  $1/b$  is located  $1/b$  of a whole unit from 0 on the number line.

**b. Represent a non-unit fraction  $a/b$  on a number line by marking off a lengths of  $1/b$  (unit fractions) from 0. Recognize that the resulting interval has size  $a/b$  and that its endpoint locates the non-unit fraction  $a/b$  on the number line.**

**Coherence KY.2.G.3→KY.3.NF.1→ KY.4.NF.3**



Note: grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6 and 8.

**Coherence KY.2.MD.6→KY.3.NF.2 →KY.4.NF.3**

**Cluster: Develop understanding of fractions as numbers. Note: grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6 and 8.**

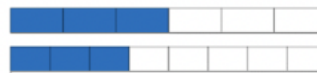
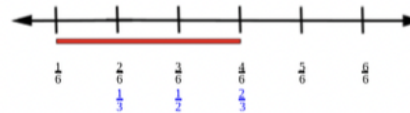
**KY.3.NF.3 Explain equivalence of fractions in special cases and compare fractions by reasoning about their size.**

- a. Understand two fractions as equivalent (equal) if they are the same size, or same point on a number line.
- b. Recognize and generate simple equivalent fractions. Explain why the fractions are equivalent through writing or drawing.
- c. Express whole numbers as fractions and recognize fractions that are equivalent to whole numbers.
- d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols  $>$ ,  $=$ , or  $<$ , and justify the conclusions.

MP.2, MP.3



When working with the same whole, students can see that  $\frac{1}{2} = \frac{2}{4}$ , and  $\frac{4}{6} = \frac{2}{3}$ .



$\frac{3}{6}$  is greater than  $\frac{3}{8}$  or  $\frac{3}{6} > \frac{3}{8}$

Note: grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6 and 8.

**KY.4.NF.1**

**Coherence KY.3.NF.3 → KY.4.NF.5**

### *Supporting Standards*

**Standards**

**Clarifications**

**Cluster: Reason with shapes and their attributes.**

Partitioned parts should be halves, thirds, fourths, sixths, eighths. Students partition a shape into 6 parts with

**KY.3.G.2 Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole.**

MP.2, M.5

equal areas and describe the area of each part as  $\frac{1}{6}$  of the area of the shape.

**KY.3.NF.1 Coherence KY.2.G.3→KY.3.G.2**

# 3rd Grade Mathematics



## Unit 7: Fractions in Data



## **3rd Grade Mathematics**

### **Unit 7: Fractions in Data**

**In this unit, students extend their understanding of the statistics process from categorical questions to numerical questions. They identify a question and collect data by measuring in fractions of an inch. Then they organize and display their results. They deepen their skills with fractions and data to answer questions about a real world situation.**

**Duration: 20 Day**

### Standards for Mathematical Practice

MP.1. Make sense of problems and persevere in solving them.  
 MP.2. Reason abstractly and quantitatively.  
 MP.3. Construct viable arguments and critique the reasoning of others.  
 MP.4. Model with mathematics.

MP.5. Use appropriate tools strategically.  
 MP.6. Attend to precision.  
 MP.7. Look for and make use of structure.  
 MP.8. Look for and express regularity in repeated reasoning.

### Priority Standards

#### Standards

#### Clarifications

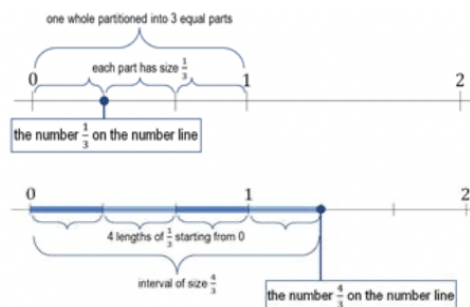
**Cluster: Develop understanding of fractions as numbers. Note: grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6 and 8.**

**KY.3.NF.2 Understand a fraction as a number on the number line; represent fractions on a number line.**

**a. Represent a fraction  $1/b$  (unit fraction) on a number line by defining the interval from 0 to 1 as the whole and partitioning it into  $b$  equal parts.**

- Recognize each part has size  $1/b$ .
- a unit fraction,  $1/b$  is located  $1/b$  of a whole unit from 0 on the number line.

**b. Represent a non-unit fraction  $a/b$  on a number line by marking off  $a$  lengths of  $1/b$  (unit fractions) from 0. Recognize that the resulting**



Note: grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6 and 8.

**Coherence KY.2.MD.6 → KY.3.NF.2 → KY.4.NF.3**

interval has size  $a/b$  and that its endpoint locates the non-unit fraction  $a/b$  on the number line.

### Supporting Standards

#### Standards

**Cluster: Understand and apply the statistics process.**

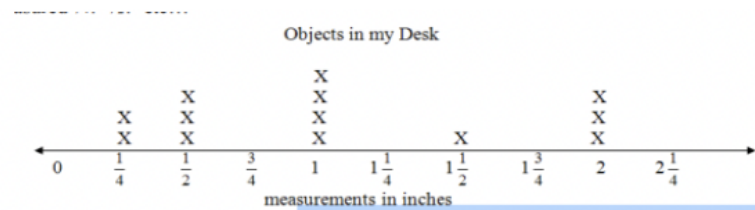
**KY.3.MD.4 Investigate questions involving numerical data.**

- Identify a statistical question focused on numerical data;
- Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch.
- Show the data by making a dot plot where the horizontal scale is marked off in appropriate units – whole numbers, halves, or quarters.
- Make observations from the graph about the question posed, including questions about the shape of the data and compare responses.

MP.1, MP.3, MP.6

#### Clarifications

Students measure objects in their desk to the nearest  $\frac{1}{2}$  or  $\frac{1}{4}$  of an inch, display data collected on a dot plot and analyze the data.



**Coherence KY.2.MD.9→KY.3.MD.4→KY.4.MD.4**