Grade 3 Math Unit 3

Content Area: **Mathematics**
Course(s):
Time Period: **Trimester 3**
Length: **59 Days**
Status: **Published**

Brief Summary of Unit

In this unit, students will build on an understanding of partitioning shapes into equal parts. Students will be introduced to fractional names such as halves, thirds, and fourths. Students will study that knowing how many equal parts will help you name fractions. Students will connect that fractions name points on a number line, and that number lines help compare fractions with whole numbers and other fractions. Additionally, students will recognize fraction models and number lines allow for fractions to have different names and therefore equivalencies, while also comparing fractions that have the same numerator or the same denominator.

Also in this unit, students will estimate and measure an object's mass to explore the concept of mass and the units of mass gram and kilogram.

Next, students will explore the idea that shapes are described, named, and grouped or categorized by attributes such as number of sides and angles, relative lengths of sides, and types of angles. Students will study the characteristics of quadrilaterals and how some quadrilaterals share some characteristics but not others. Students will classify quadrilaterals by their attributes. In this unit, students will also calculate the perimeter of a figure from its side lengths and determine unknown side lengths from a given perimeter. Additionally, students will recognize that rectangles with the same area might have different perimeters or have the same perimeter and different areas. Finally, students will draw on what they know about fractions and area. They will compare models to explore different ways that one half of a square can be shaded. Students will also show different ways to divide a shape into equal parts.

Revision Date: August 2024

Essential Questions/Enduring Understandings

Essential Questions:

- How can you compare fractions?
- What relationships can I discover about fractions?
- How are fractions used in problem-solving situations?
- How can you measure how long an event takes from start to finish?
- Why is it important to know the mass of an object?

- How can you estimate mass and liquid volume?
- How can you use the attributes of quadrilaterals to classify them?
- How can you find the perimeter of a shape?
- How do the attributes help us identify the different quadrilaterals/shapes?
- How is it possible to have a shape that fits into more than one category?
- What does it mean to partition a shape into parts?
- What is the relationship between perimeter and area?

Enduring Understandings:

- Students will understand that you can use what you know about fractions to compare fractions that have the same numerator or the same denominator.
- Students will understand that you can measure length to different fractional increments, such as the nearest quarter and half inch, and plot the length data on line plots.
- Students will understand that both analog and digital clocks are used to tell time and knowing how to read and tell time to the nearest minute will help you solve problems involving elapsed time.
- Students will understand that you can use what you know about measurement to estimate and measure volume of liquid in liters and the mass of an object in grams or kilograms.
- Students will understand that two-dimensional shapes have many attributes and knowing about these attributes will help you categorize shapes.
- Students will understand that perimeter is the sum of a shape's side lengths, and area measures the space inside the shape. Knowing a rectangle's perimeter or area can help you reason about the shape.
- Students will understand that you can divide shapes into equal parts to show fractional parts of a whole.

Students Will Know/Students Will be Skilled At

Students will know:

- How to compare fractions with the same numerator or the same denominator, including using <,>, and =.
- How to measure length to the nearest ½ or ¼ inch and show data on a line plot.
- How to tell and write time to the nearest minute on digital clocks and clocks with hands and solve

problems about time.

- How to estimate liquid volume and solve problems about liquid volume.
- How to estimate mass and solve problems about mass.
- How to describe shapes, compare them, and put them in groups that tell how they are alike, for example: by the number of sides or by whether they have right angles.
- How to compare quadrilaterals, and put them in groups based on their attributes, for example: all 4 sides are the same length or there are 2 pairs of parallel sides.
- How to solve problems involving perimeters, including finding an unknown side length, and finding rectangles with the same perimeter and different areas or with the same area and different perimeters.
- How to divide rectangles into parts with equal area and name the area of shaded parts using unit fractions.

Students will be skilled at:

- Comparing fractions with the same numerator or the same denominator, including using <,>, and =.
- Measuring length to the nearest ½ or ¼ inch and showing data on a line plot.
- Telling and writing time to the nearest minute on digital clocks and clocks with hands and solve problems about time.
- Estimating liquid volume and solving problems about liquid volume.
- Estimating mass and solving problems about mass.
- Describing shapes, comparing them, and putting them in groups that tell how they are alike, for example: by the number of sides or by whether they have right angles.
- Comparing quadrilaterals, and putting them in groups based on their attributes, for example: all 4 sides are the same length or there are 2 pairs of parallel sides.
- Solving problems involving perimeters, including finding an unknown side length, and finding rectangles with the same perimeter and different areas or with the same area and different perimeters.
- Dividing rectangles into parts with equal area and name the area of shaded parts using unit fractions.

Learning Plan

Daily Warm-ups (5-10 minutes):

*As an opening to each math lesson, the instructor can use these different routines

- Number Talks- District Created Resource (Linked Below in Materials)

- Number Bounce- Begin this routine by telling your students that you will count forward or backward by ones starting with a specific number and ending with a specific number. Let your students know that when you tap them, they will have to say the next number. Here is one example using the start number 213 and the end number 235. Start counting forward by ones like: 213, 214, 215, 216. Next tap a student on the shoulder. The student says 217. Then continue counting: 218, 219, 220. Tap a different student. The student says 221. Continue to count in this way until I have given most of the students an opportunity to answer. The student who says the last number in the sequence says, "235. Bounce" and gets the opportunity to do a 20-second celebratory dance. This routine also works well for fractions and decimals.

- Base Ten Toss- A beach ball or bean bag is recommended when implementing this routine. Begin this routine by telling your students that they will count in base ten language until they reach a base ten decade with no ones (example: 3 tens 0 ones or 30, 4 tens 0 ones or 40). For this routine, students stand in a circle. After one student counts in base ten language (ex. 7 tens 5 ones…75), he or she passes a beach ball or bean bag to the person standing next to them. When a student says a base ten decade with no ones (ex. 8 tens 0 ones…80) they get the opportunity to toss the beach ball to any classmate of their choice. For example: Count forward starting with 5 tens 9 ones…59. Next person 6 tens 0 ones..60, next person 6 tens 1 one…61, etc. This routine works for larger numbers and decimals as well. Students can add on hundreds (ex. 6 hundreds 9 tens and 8 ones…698) or hundredths (ex. 6 tens 7 ones and 37 hundredths…67.37). For more of a challenge, they can count backward.

- Amazing Race- Students work in pairs to decompose a given number in as many different ways as they can. You should provide each partner pair with a blank piece of paper or this sheet. You can give your students 5 – 10 minutes to record as many different ways to represent the number as possible. After the time is up, 1 or 2 partner pairs can randomly be selected to share what they recorded, in front of the class. This routine can easily be adapted to fractions or decimals. For example, you can write 7/10 or 0.7 as the number of the day. Students get a chance to be as creative as possible when recording. When you first start this routine, your students may only have 2 or 3 different ways. That's OKAY….. If you consistently use this routine your students will evolve and ultimately fill the page! As a quick tip, you can award team points to partner pairs that had the most inventive and correct ways. It is very important to check for accuracy.

- Number Strings- This routine helps to build students' mental math capabilities. The teacher writes a problem horizontally on the board in a whole group or small setting. The students mentally solve the problem and share with the whole group how they solved it. They must justify and defend their reasoning. The teacher records the students' thinking in an open number line and poses extended questions to draw out deeper understanding for all. The teacher can have students share other students' strategies to the whole group or with turn and talk. Eventually provide a few number sentences on the board to solve within 20 and multiplication to ten and model how you can use mental math strategies to solve them in a snap just like they would on a fact test, then let them try solving in a snap as you point to each number sentence.

1. Third graders need to be fluent in adding and subtracting within 20 as well as multiplying to ten. This is a skill that should be worked on throughout the year utilizing the Ready Math Program and supplemental resources that are located under materials.

2. Understand Comparing Fractions- Instruct students to apply their understanding of fractions to compare two fractions that have the same numerator or the same denominator. They use fraction models and number lines

to reason about the size of the unit fractions that make up each fraction. Students recognize that fractions with the same denominator are composed of same-sized unit fractions. Students also recognize that fractions with the same numerator and different denominators are composed of different-sized unit fractions and use that understanding to reason that for fractions with the same numerator, the fraction with the greater denominator is the lesser fraction. Students should be taught with and use visual models.

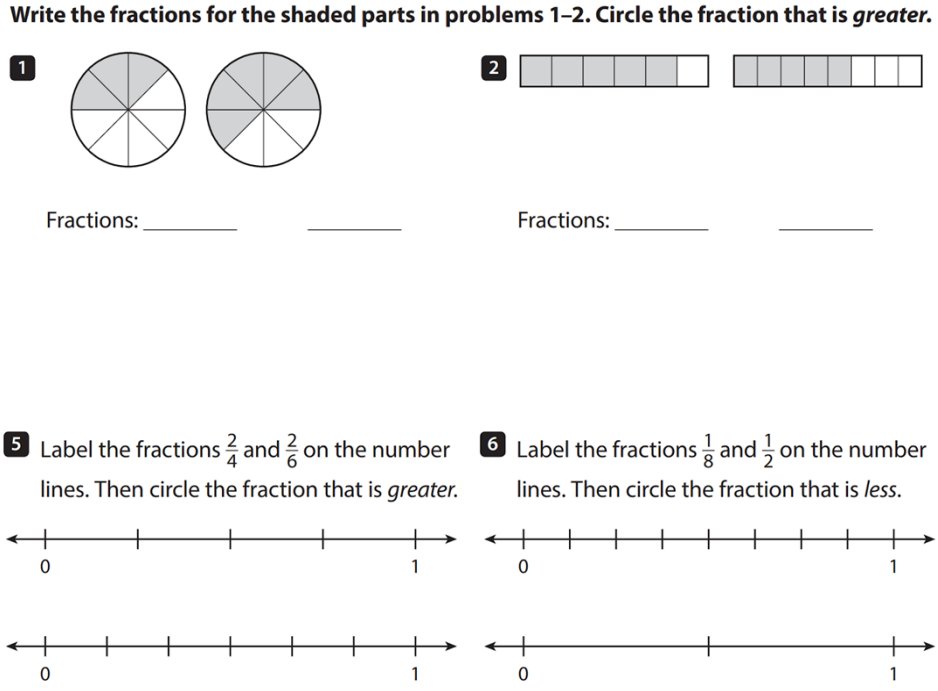
a. Complete Lesson 24, Sessions 1-3 (3 days)

b. Possible strategies include but are not limited to:

   i. Students should use fraction strips, tiles, number lines, or area models to develop an understanding of how the size of a unit fraction changes as the denominator gets bigger.

   ii. Students should use fraction strips, tiles, number lines, or area models to compare fractions with the same numerator or same denominator.

c. Students should be exposed to problems like the ones below:



d. Lesson Vocabulary: compare, denominator, numerator, unit fraction

3. Use Symbols to Compare Fractions- Instruct students to continue their work comparing two fractions that have the same numerator or the same denominator. Students now use symbols (>, <, or =) to record the comparisons. Students use models and number lines to explain the reasoning behind their comparisons. Students should be taught with and use visual models.

a. Complete Lesson 25, Sessions 1-3 (3 days)

b. Possible strategies include but are not limited to:

i. Students act out fraction comparisons using the fractions ⅙, 2/6, 3/6, 4/6, ⅚, 6/6

1. Have one index card per fraction.

2. Shuffle index cards placed facedown and have three students stand side-by-side. The two outer students each pick and hold up a fraction card. The middle student compares the fractions and imitates < or > by opening their arms towards the greater fraction.

3. Shuffle and repeat. If time allows, repeat with other fraction units.

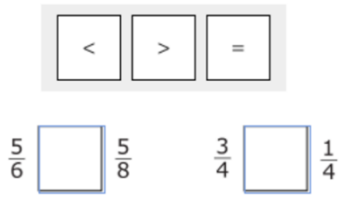
ii. Encourage students to prove comparison statements by using area models, number lines, or fraction strips/tiles as used in Lesson 24.

iii. Encourage students to think about everyday places or situations where people might need to compare two fractions. Example: A bowl holds ½ cup of milk. You need ¼ cup of milk to make pancakes. Is the amount of milk in the bowl greater than or less than the amount you need?

c. Students should be exposed to problems like the ones below:

Two pairs of fractions are shown. Which symbol correctly compares each pair of fractions?

Drag and drop the symbol that correctly compares each pair of fractions into each box.



Damian wrote a sentence using the fractions $\frac{2}{3}$ and $\frac{2}{6}$.

"The numerators of $\frac{2}{3}$ and $\frac{2}{6}$ are equal, so the fractions are equal."

Damian is incorrect in his reasoning.

- Explain why Damian is incorrect in his reasoning about numerators.
- Write a correct comparison for $\frac{2}{3}$ and $\frac{2}{6}$ using < or >.
- Explain why your reasoning is correct.

Enter your answer and your explanations in the space provided.

d. Lesson Vocabulary: compare, denominator, greater than symbol (>), less than symbol (<), numerator

4. Measure Length and Plot Data on Line Plots- Instruct students to build on their previous work and begin to analyze data that they display in the line plots. Students extend their knowledge of measuring to the nearest inch to measure objects to the nearest ½ inch and ¼ inch. They organize the collection of data in a table and draw a number line to begin representing the data on a line plot. They see that just as you can mark fractions on a number line, you can also use them as scale numbers on a line plot. Students then make line plots for measurement data that include fractions and answer questions about the line plots to learn about he dta. For example, they determine the total number of data points, identify the least and greatest data values, find the number of items that have a measurement less than or greater than a given value, and find the data value that occurs most often.

a. Complete Lesson 26, Sessions 1-4 (4 days)

b. Possible strategies include but are not limited to:

    i. Provide students with physical rulers to use throughout the lesson. Show students that fractions on a number line and reading a ruler are connected.

    ii. Label blank paper rulers as if you would a number line.

    iii. Review rounding and "nearest" units.

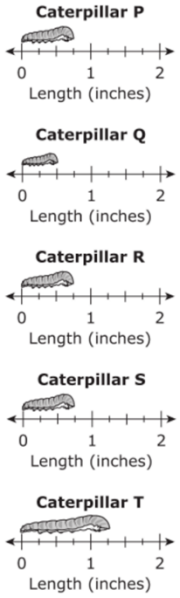
    iv. Remind students it may be easier to find the distance between two points; so it might be helpful to mark a straight edge at the beginning and ending of an object.

    v. Students can measure the short size and then the long size of an index card where they will get an exact whole number measurement. Then, using the ruler, students draw a diagonal line from one corner to another and measure that one. This line will require a rounded measurement.

    vi. Show students that displaying data on a line plot is created based on collected data and creating a related number line.

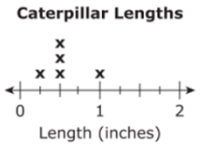
c. Students should be exposed to problems like the ones below:

A student measures the lengths of five caterpillars for a science project.

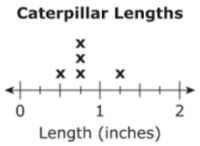


The student uses the measurements to make a line plot. Which line plot is correct?

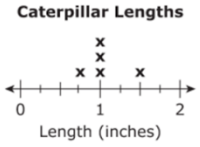
A.



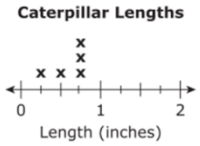
B.



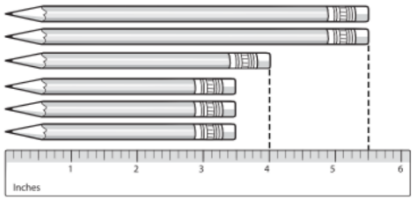
C.



D.

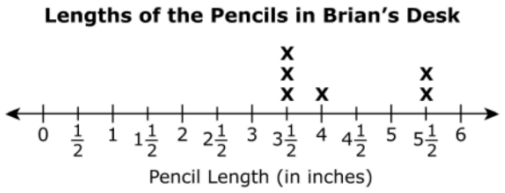


Brian measured the lengths, in inches, of the pencils in his desk as shown.

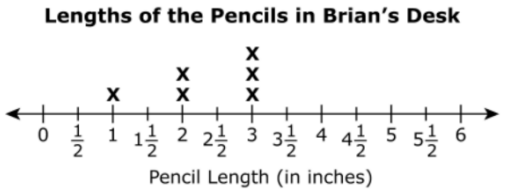


Which of these line plots shows the length of each pencil plotted correctly?

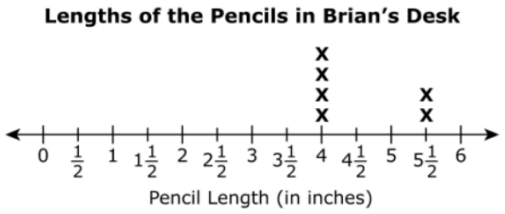
A.



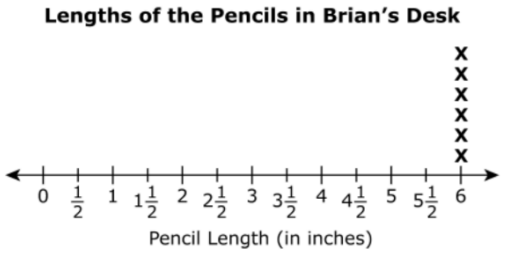
B.



C.



D.



d. Lesson Vocabulary: data, length, line plot, measure

5. Time- Instruct students to learn to tell time to the nearest minute, using both analog and digital clocks, including AM and PM labels. Counting forward from the current hour on an analog clock, students tell time as the number of minutes past the hour. They learn that they can also count backward from the next hour to tell the time as the number of minutes before the next hour. Students recognize, for example, that 12:43 PM is the same time as 17 minutes before 1:00 PM. Students then apply these skills to measuring time intervals in minutes as well as to solving problems involving addition and subtraction of time intervals. Students reason about the relationship between start time, elapsed time, and end time, using models of clocks and number lines. Given a start time and intervals of elapsed time, students determine end time. Conversely, given an end time and interval of elapsed time, students determine the start time.

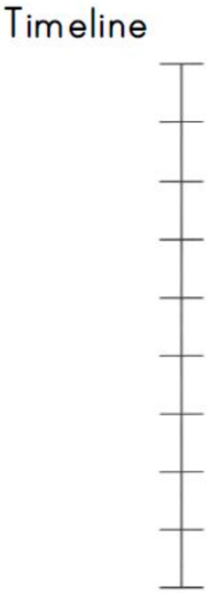
a. Complete Lesson 27, Sessions 1-5 (5 days)

b. Possible strategies include but are not limited to:

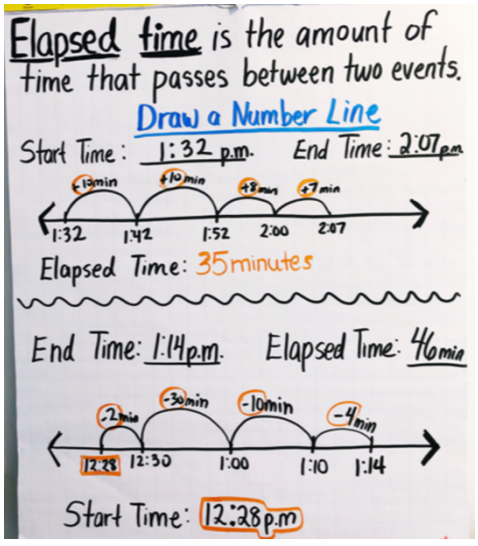
   i. Label a clock with multiples of 5, focusing on one group of 5 minutes as 1-minute intervals.

   ii. Create a daily schedule focusing on differentiating between classes and activities that occur before and after 12:00 PM. Students can include lunch. Encourage students to include time spans (11:30 AM - 1:00 PM).

   iii. Create vertical timelines to mark the cycles of AM and PM.



i. Use open number lines to assist with elapsed time.



i. Play matching games such as: Analog and Digital times or 12:43 and 17 minutes before 1:00; I Have, Who Has…? (I have 1:00 PM. Who has 15 minutes before 3 PM?)

c. Students should be exposed to problems like the ones below:

What is the time shown on the clock?

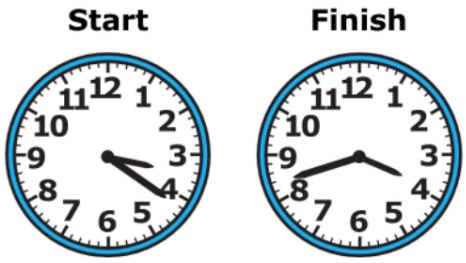
- A. 11:09
- B. 11:11
- C. 11:14
- D. 11:16

Jessica came home at 3:20 p.m. She worked on her homework for 24 minutes. After she finished her homework, she did her three chores.

- It took her 23 minutes to clean her room.
- It took her 8 minutes to feed the animals.
- It took her 10 minutes to set the table.

What time did she finish her homework? How long did it take her to finish her three chores? Show all your work.

The clocks show when Jemma started and finished her homework.



Which statements are true?

Select the **three** correct answers.

- A. Jemma started her homework at 3:21.
- B. Jemma spent 42 minutes on her homework.
- C. Jemma finished her homework at 4:42.
- D. Jemma spent 21 minutes on her homework.
- E. Jemma started her homework at 4:17.
- F. Jemma finished her homework at 3:42.

d. Lesson Vocabulary: elapsed time, minute (min), AM, hour (h), hour hand, minute hand, PM

6. Liquid Volume- Instruct students with a formal introduction to the concept of liquid volume. They learn how to relate the amount of liquid in 1 liter to the amount of liquid in containers they are familiar with, such as single-serving milk containers and larger milk jugs. Using pictures, students estimate the liquid volume of a container by seeing how much of the container is filled by a 1-liter amount of liquid and then using that information to estimate how many liters of liquid the container can hold when full. Students also solve one-step word problems about liquid volume by writing and solving addition, subtraction, multiplication, or division equations that represent the problem situations.

a. Complete Lesson 28, Sessions 1-4 (4 days)

b. Possible strategies include but are not limited to:

i. Have students brainstorm different liquids which they are familiar with. Determine how the liquid is typically packaged. Prompt students to include liquids other than those they consume (dishwashing detergent, medicines, paint). Add to the table as the lesson progresses and new ideas are discovered.

ii. Display a product label that states the liquid volume of the product. HIghlight how the liquid volume is provided using customary and metric units.

iii. Provide opportunities for students to use appropriate tools to measure and estimate liquid volume.

iv. Identify 1-liter amounts in different-shaped containers:

1. Use a 1-liter container to measure 1 liter of water. Make sure students see that the

container has 1 liter of liquid. Pour the liter of water into one of the other containers.

2. Repeat this for each of the different containers, making sure students see that the 1-liter container always contains 1 liter before pouring it onto another container.

3. Identify that the same amount of liquid takes the shape of different containers and can look different, but is the same.

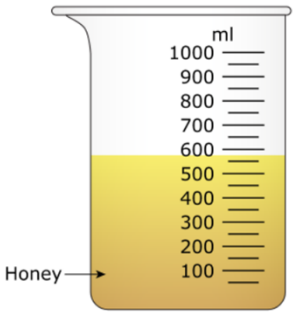
v. Discuss why a measuring cup is a reasonable tool to measure liquid rather than a ruler.

vi. Using provided liquid capacity containers, act out word problems as needed.

c. Students should be exposed to problems like the ones below:

Part A

What is the amount of honey in the measuring cup rounded to the nearest 100 milliliters (ml)?



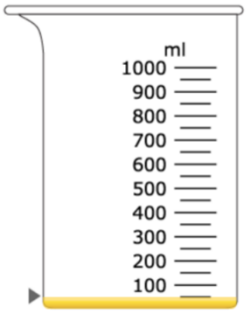
Enter your answer in the box.

[ ] milliliters

Part B

Jay needs 740 milliliters (ml) of honey to make banana bread. He has 290 ml. How many more milliliters of honey does Jay need?

Drag the mark on the measuring cup to show how many more milliliters of honey Jay needs.



d. Lesson Vocabulary: liquid volume, liter (L), measure

7. Mass- Students should be taught the concept of mass as a way to tell how heavy an object is. Guide students to use familiar objects such as a paper clip and hard cover book as references to understand a mass of 1 gram and 1 kilogram. To estimate mass, instruct students to look at pictures of an object on a balance scale or reasons about the object's mass in relation to the mass of a familiar object. Students should be taught one-step word problems that involve mass.

a. Complete Lesson 29, Sessions 1-4 (4 days)

b. Possible strategies include but are not limited to:

   i. Provide opportunities for students to use appropriate tools to measure and estimate masses of objects in grams and kilograms.

   ii. Students need practice in reading the scales on measuring tools (weights in the pictures) since the markings may not always be in intervals of one. The scales may be marked in intervals of two, five or ten.

   iii. Allow students to hold gram and kilogram weights in their hand to use as a benchmark.

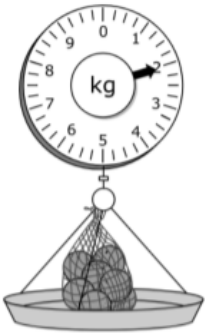
   iv. Students should estimate masses before actually finding the measuring. Show students a group containing the same kind of objects. Then, show them one of the objects and tell them its weight. Fill a container with more objects and ask students to estimate the weight of the objects.

c. Brainpop Jr. Video: Grams and Kilograms

d. Students should be exposed to problems like the ones below:

Part A

Mr. Smith, the principal, placed a bag of oranges on the scale as shown.



Mr. Smith bought 60 bags of oranges for a school event. How many kilograms of oranges did he buy?

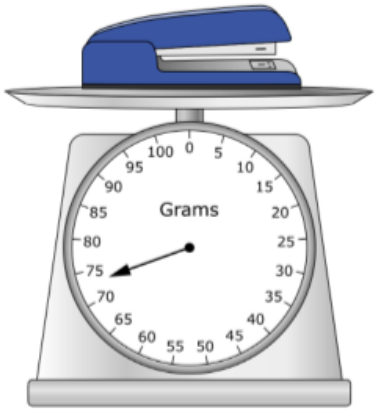
- A. 2 kilograms
- B. 62 kilograms
- C. 80 kilograms
- D. 120 kilograms

Part B

Mr. Smith bought 500 liters of juice for the event. After the event they had 29 liters of juice left over. How many liters of juice did they use at the event?

- A. 471 liters
- B. 481 liters
- C. 571 liters
- D. 581 liters

Which is closest to the mass of the stapler?



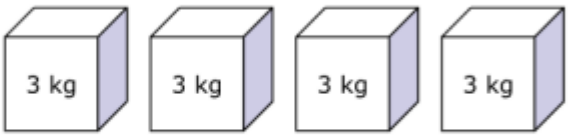
A. 15 grams

B. 25 grams

C. 65 grams

D. 75 grams

Each of 4 cubes has a mass of 3 kilograms as shown.



What is the total mass, in kilograms, of the 4 cubes?

Enter your answer in the box.

e. Lesson Vocabulary: gram (g), kilogram (kg), mass, Review the following terms: estimate (noun), estimate (verb), measure

Note: In earlier grades, students had experiences with particular shapes through sorting and classifying using their geometric attributes. Students have built and drawn shapes given the number of faces, number of angles and number of sides. The focus now is on identifying and describing properties of two-dimensional shapes in more precise ways using properties that are shared rather than the appearances of individual shapes.

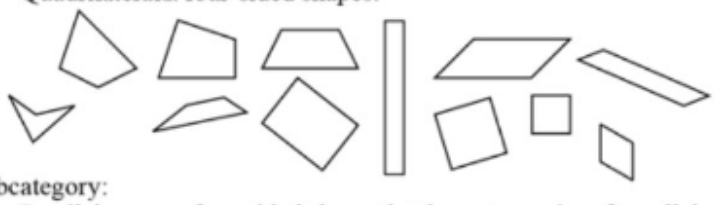
8. Understand Categories of Shapes- Instruct students to compare shapes and group them by their attributes. Students should be taught to identify and draw shapes that belong and do not belong to a particular group or category.

a. Complete Lesson 30, Sessions 1-3 (3 days)

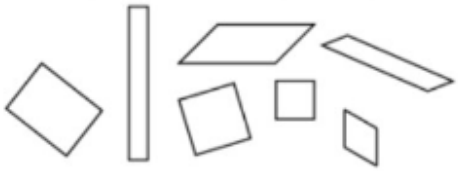
b. Possible strategies include but are not limited to:

i. Students should analyze, compare, and classify two dimensional shapes by their properties. The chart below is for teacher use. In this lesson, the students are to look at attributes and not formally name shapes.

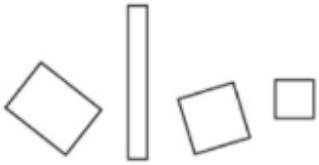
Quadrilaterals: four-sided shapes.



Subcategory:
Parallelograms: four-sided shapesthat have two pairs of parallel sides.



Subcategory:
Rectangles: four-sided shapes that have four right angles. They also have two pairs of parallel sides. We could call them "rectangular parallelograms."



Subcategory:
Squares: four-sided shapesshapes that have four right angles and four sides of the same length. We could call them "rhombus rectangles."

The representations above might be used by teachers in class. Note that the leftmost four shapes in the first section at the top left have four sides but do not have properties that would place them in any of the other categories shown (parallelograms, rectangles, squares) Taken from the Achieve the Core Website.

ii. You can give students a bag of precut shapes to sort in categories of their making and describe those categories. Use theseshapes. Pose the following questions as students sort. Adapted from the Georgia Department of Education Activity: Shape Sorter

1. Why does this shape belong with these shapes and not in this other group?

2. How might this shape fit with these?

3. Do you agree with your group members' decisions about the categories chosen for each shape? Did you see the shape in a different way?

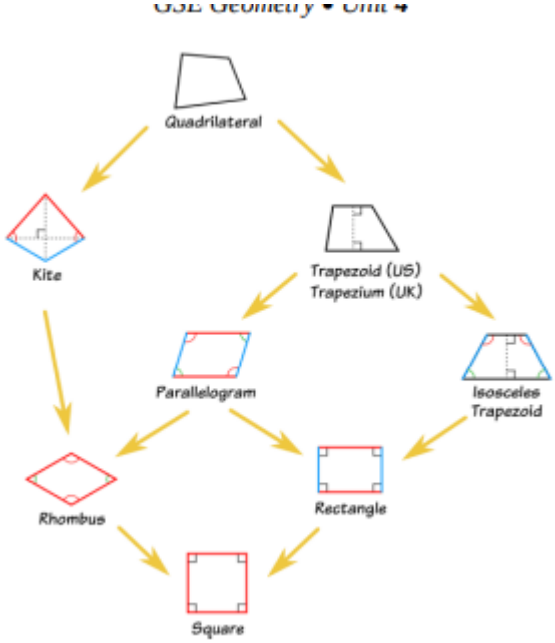
c. Lesson Vocabulary: rectangle, right angle, angle, hexagon, pentagon, rhombus

9. Classify Quadrilaterals- Instruct students to consider how categories of shapes are related as they classify quadrilaterals. Students should be taught to identify quadrilaterals as four-sided shapes and recognize that other attributes of quadrilaterals distinguish one shape from another. Instruct students to identify parallelograms, rectangles, and rhombuses based on attributes, such as the number of right angles, presence of parallel sides, and sides and pairs of sides that are the same length. Students should be taught to compare attributes of squares and rectangles and come to understand that although all squares are rectangles, not all rectangles are squares. Instruct students to name and draw quadrilaterals based on given attributes.

a. Complete Lesson 31, Sessions 1-4 (4 days)

b. Possible strategies include but are not limited to:

i. For Teacher Reference ONLY – Taken from http://www.regentsprep.org/regents/math/geometry/GP9/LQuad.htm



Quadrilateral: A quadrilateral is any four-sided figure. Do not assume any additional properties for a quadrilateral unless you are given additional information.

Trapezoid: A trapezoid has at least one set of parallel sides.

Parallelogram: A parallelogram has 2 sets of parallel sides, 2 sets of congruent sides, opposite angles congruent, consecutive angles supplementary, diagonals bisect each other and the diagonals form 2 congruent triangles

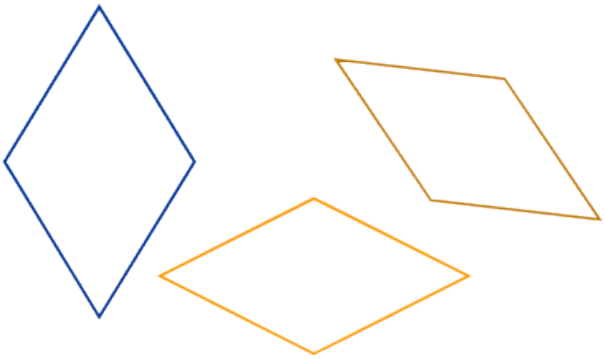
Rectangle: The rectangle has all of the properties of the parallelogram, PLUS 4 right angles, and diagonals congruent

Rhombus: The rhombus has all of the properties of the parallelogram, PLUS 4 congruent sides, diagonals

bisect angles, diagonals perpendicular

Square: The square has all of the properties of the parallelogram AND the rectangle AND the rhombus

ii. Provide students with quadrilaterals in their named groups (These are Rhombuses, etc.)



Have the students write their observations of those shapes. Create a class chart of the class definitions that describe each category.

iii. Students can use the index card to check angles, compare side lengths and draw lines if needed.

iv. Encourage students to use "at least" when describing how many of something the shape has. For example, a rectangle has at least 4 square corners.

v. Have students compare sides by using a ruler to measure (length), and angles (square, smaller than square, larger than square). Some students may begin to see diagonals and symmetries of the shapes. Have groups share what they discovered together and create a class list for each shape.

c. BrainPop Jr Video: Quadrilaterals

d. Lesson Vocabulary: attribute, parallel, parallelogram, Review the following terms: quadrilateral, rectangle, rhombus, right angle

10. Area and Perimeter of Shapes- Students should be taught how the perimeter of a rectangle is related to its area. Instruct students to find the perimeter of a shape by adding together the side lengths of a shape. Students should be given a perimeter and should determine the unknown side length. Instruct students to recognize that rectangles can have the same area and different perimeters or the same perimeter and different areas. Students should investigate these relationships with drawings of rectangles as well as with tables that list measurements of rectangles with the same area and different perimeters using their knowledge of multiplication facts.

a. Complete Lesson 32, Sessions 1-5 (5 days)

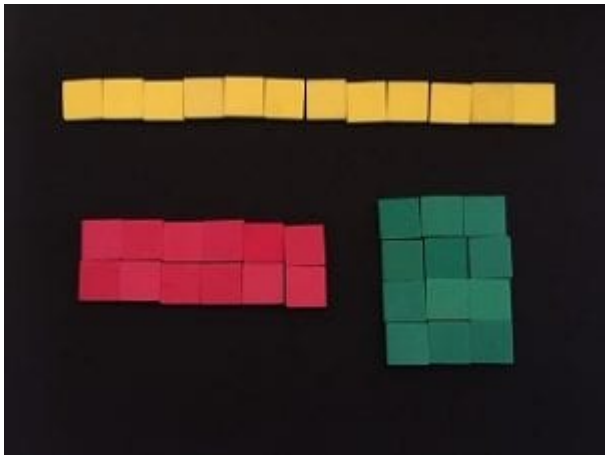
b. Possible strategies include but are not limited to:

i. Some students have difficulty understanding the difference between area and perimeter. Use color tiles to have students differentiate between the two. Here are two ways to emphasize perimeter versus area using square colored tiles:

1. Replace the outer tiles with a different color.

2. Remove the inner tiles, leaving only the perimeter.

Give the students dimensions of rectangles to create with the tiles. Have them determine the area and then the perimeter.



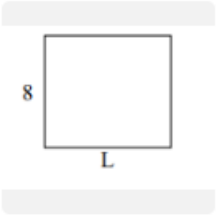
Post-it notes can also be used for this task.

ii. The tiles and post-it notes can also be used to have students create figures with the same area and different perimeter as well as same perimeter and different area. Numbers to use that will have a variety of combinations for the same area, different perimeter are: 20, 24, 28, 30, 36, 40, and 60 (There are others.)

iii. Use the tiles in the hall or classroom for students to find area and perimeter. Use tape to measure specific areas within the classroom. You can ask students to measure a section of the classroom for students to solve. Or, you can give students a specific measurement of area (ex: 12 square feet or a rectangle with the perimeter of 8) to tape. Added bonus to letting students tape off sections: Whenever students move around the classroom, the concept of area and perimeter is reinforced. If you don't have tiles you can make ‘tiles’ for students to use to measure. See the picture below.

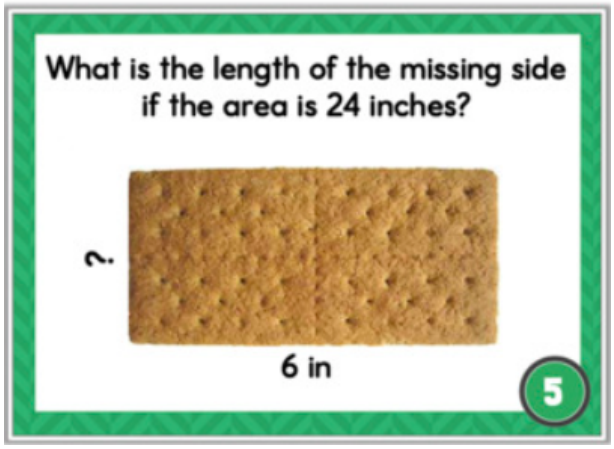
c. [Brainpop Jr. Video: Perimeter]

d. Remember to pose questions to the students with missing information. Provide the perimeter or area with a missing length or width. For example:



If the perimeter of the rectangle is 56 cm, what is the missing side?

- 20 cm
- 8 cm
- 9 cm
- 30 cm



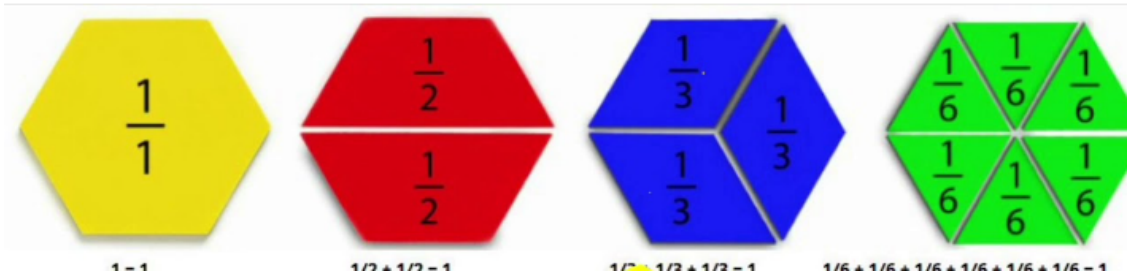
e. Lesson Vocabulary: perimeter, Review the term: area

11. Partition Shapes- Instruct the students to divide rectangles into equal parts. Guide students to recognize that equal parts have equal areas by combining their understanding of fractions as equal parts of a whole with their understanding of area of rectangles. For example, students recognize that each equal part of a rectangle divided into six equal parts has an area that is ⅙ of the whole rectangle. Students should be taught to use models such as folded sheets of rectangular paper and rectangles divided into rows of same-sized squares to develop an understanding of equal fractional parts having equal areas. Guide students to extend this knowledge to other shapes such as circles and hexagons.

a. Complete Lesson 33, Sessions 1-3 (3 days)

b. Possible strategies include but are not limited to:

i. When partitioning a whole shape into parts, it is important to understand that the size of the parts must be equal, but the shape of the parts do not have to be the same. One way to do this is with pattern blocks. Only the hexagons, trapezoids, rhombuses, and triangles are needed. Students can place different sized shapes on top of each other to partition them equally. For example:



Students should be exposed to a variety of shapes and not limited to the rectangle and circle. It is important that the students work with a variety of regions so that they do not think of the region as only "pieces of a pie." For this reason, pattern blocks are an appropriate tool for work with the region model. Questions to ask while students work are:

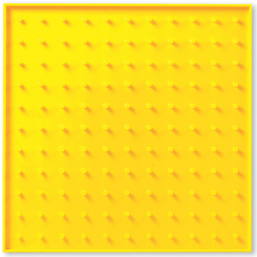
1. How many triangles does it take to make a hexagon?

2. Show me more than one way to make a trapezoid. Write the fraction that each pattern block represents.

3. Does 1/3 represent the triangle in the rhombus and the hexagon? How do you know?

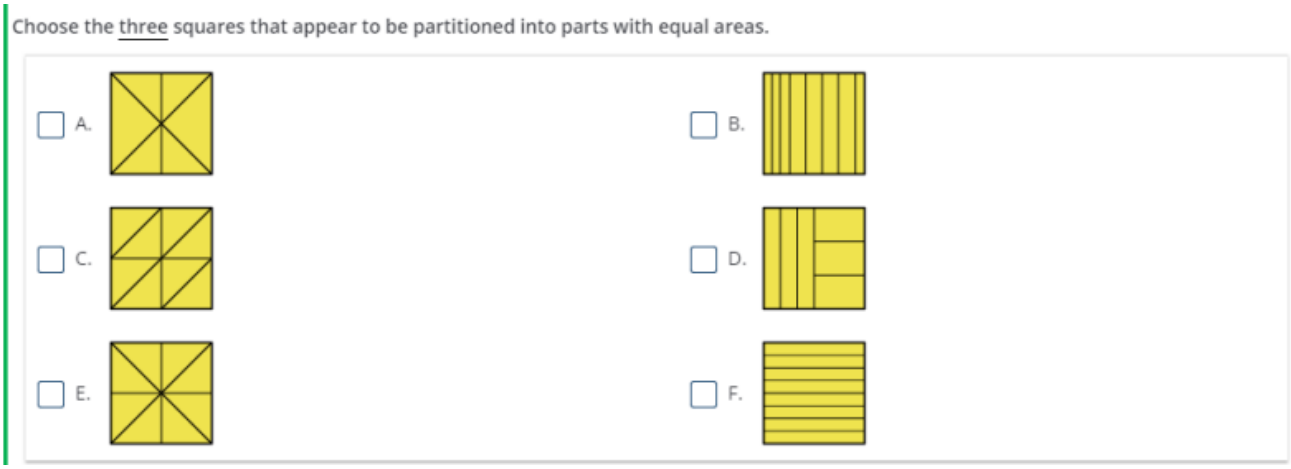
ii. This activity was adapted from the Georgia Department of Education. Students can use a geoboard and rubber bands to section a parcel of land. Pose: Great Uncle John has a parcel of land that measures 6 miles by 4 miles. In his will, he left the land to be divided equally among his (2, 3, 4, 6, or 8) nieces and nephews. However, he forgot to partition the land. Please help the nieces and nephews determine which parcel of land is theirs. Be sure to give everyone an equal amount of land. Use the geoboard below to help you. (Make sure students use a 6 x 4 space). How much land did Great Uncle John leave his nieces and nephews? What does each person's share look like? How do you know that each person's share is equal? How did you determine the amount of land each person will get? Is there another way that the land could have been divided? Questions to pose while students are working are:

1. Have you shown all of the different ways you could divide the parcel of land? How do you know?
2. How would we do this task with other shapes?
3. Looking at your different solutions, how are they alike? How are they different?
4. Why did you decide to divide the land this way?



iii. Partition Shapes into parts: https://tasks.illustrativemathematics.org/content-standards/3/G/A/2/tasks/1061

c. Question students should be exposed to:



d. Lesson Vocabulary: area, equivalent fractions, fraction, unit fraction

GENERAL QUESTIONS FOR TEACHER USE

Adapted from Growing Success and materials from Math GAINS and TIPS4RM (Georgia Department of Education)

Reasoning and Proving

• How can we show that this is true for all cases?

• In what cases might our conclusion not hold true?

• How can we verify this answer?

• Explain the reasoning behind your prediction.

• Why does this work?

• What do you think will happen if this pattern continues?

• Show how you know that this statement is true.

• Give an example of when this statement is false.

• Explain why you do not accept the argument as proof.

• How could we check that solution?

• What other situations need to be considered?

Reflecting

• Have you thought about...?

• What do you notice about...?

• What patterns do you see?

• Does this problem/answer make sense to you?

• How does this compare to...?

• What could you start with to help you explore the possibilities?

• How can you verify this answer?

• What evidence of your thinking can you share?

• Is this a reasonable answer, given that...?

Selecting Tools and Computational Strategies

• How did the learning tool you chose contribute to your understanding/solving of the problem? Assist in your communication?

• In what ways would [name a tool] assist in your investigation/solving of this problem?

• What other tools did you consider using? Explain why you chose not to use them.

• Think of a different way to do the calculation that may be more efficient.

• What estimation strategy did you use?

Connections

• What other math have you studied that has some of the same principles, properties, or procedures as this?

• How do these different representations connect to one another?

• When could this mathematical concept or procedure be used in daily life?

• What connection do you see between a problem you did previously and today's problem?

Representing

• What would other representations of this problem demonstrate?

• Explain why you chose this representation.

• How could you represent this idea algebraically? graphically?

• Does this graphical representation of the data bias the viewer? Explain.

• What properties would you have to use to construct a dynamic representation of this situation?

• In what way would a scale model help you solve this problem?

Note: The instructor is encouraged to consult the supplemental resources located under materials to personalize and differentiate instruction for students, as well as address any learning gaps based on formative assessments.

Evidence/Performance Tasks

Formative Assessment:

- Fact Fluency Practice Assessments
- Administer Ready Math Lesson Quizzes at the end of each Lesson
- Administer Comprehension Check (digital)

Summative Assessments:

- Administer Ready Math Mid-Unit Assessments
- Administer Ready Math End of Unit Assessments

Benchmark Assessments:

- iReady Diagnostic
- Fact Fluency Assessment
- Acadience Assessment (As a reference, these assessments are not administered by the classroom teacher)

Alternative Assessments:

- Informal Observation
- Small Group Observation
- Exit Tickets
- Math Journal
- Oral and Written Explanations of Reasoning

Materials

The following are approved resources that teachers can include to further unit related objectives:

- Ready Math Teacher Toolbox Resources
    - Whole Class Instruction
        - Teach: Instruction & Practice, Interactive Tutorials,

        - Assess: Lesson Quizzes & Unit Assessments
    - Small Group Differentiation
        - Prepare: Prerequisite Lessons
        - Reteach: Tools for Instruction
        - Reinforce: Math Center Activities
        - Extend: Enrichment Activities
- Ready Math Workbook
- Ready Math Slides
- Digital Math Tools
- iReady My Path
- Learning Games
- The First 10 Weeks Number Talks
- The Second 10 Weeks Number Talks
- The Third 10 Weeks Number Talks
- The Fourth 10 Weeks Number Talks
- Manipulatives: counters, tens frames, connecting cubes, base 10 blocks, fraction strips,
- White boards
- Number paths
- Hundred charts
- Blank Bar Models
- Grid Paper
- Blank Number Bonds
- CPS District Mathematics Google Drive Folder
- Literature to assist in teaching:
    - Core Book List 2022-2023
    - *Comparing Fractions* by Minta Berry
    - *How Long or How Wide: A Measuring Guide* by Brian P. Cleary

- *Carrie Measures Up* by Linda W. Abner
- *It's About Time* by Stuart J. Murphy
- *Clocks and More Clocks* by Pat Hutchins
- *Measuring Volume* by Beth Bence Reinke
- *If You Were a Quadrilateral* by Molly CeCe Barlow Blaisdell
- *Squares Rectangles and other Quadrilaterals* by David A. Adler
- *Spaghetti and Meatballs For All* by Marilyn Burns (Perimeter/Area)
- *Chickens on the Move* by Pam Pollard and Meg Belviso (Perimeter/Area)

Supplemental Resources:

- iReady My Path
- iReady Learning Games
- Third Grade NJSLA Questions Organized By Topic
- Acing Math- Card games that support a variety of math skills
- BrainPop: Comparing Fractions
- BrainPop: Elapsed Time
- MathNook (Time Games)
- This site allows students to move corners to make different quadrilaterals
- Virtual Geoboard
- Pattern Block Fractions
- Various Grid and Dot Paper Templates
- Randomly generated rectangles for which the perimeter and the area can be found

Note: Any additional resources that are not included in this list will be presented to and reviewed by the supervisor before being included in lesson plans. This ensures resources are reviewed and vetted for relevance and appropriateness prior to implementation.

Standards

In accordance with New Jersey's Chapter 32 Diversity and Inclusion Law, this unit includes instructional materials that highlight and promote diversity, including: inclusion, tolerance, and belonging in connection with gender and sexual orientation, race and ethnicity, disabilities, and religious tolerance.

MATH.K-12.1	Make sense of problems and persevere in solving them
MATH.K-12.2	Reason abstractly and quantitatively
MATH.K-12.3	Construct viable arguments and critique the reasoning of others
MATH.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.
MATH.K-12.4	Model with mathematics
MATH.K-12.5	Use appropriate tools strategically
MATH.K-12.6	Attend to precision
MATH.K-12.7	Look for and make use of structure
MATH.K-12.8	Look for and express regularity in repeated reasoning
MATH.3.OA.C.7	With accuracy and efficiency, 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.
MATH.3.NBT.A.2	With accuracy and efficiency, add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.
MATH.3.NF.A.1	Understand a fraction $1/b$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size $1/b$.
MATH.3.NF.A.2.a	Represent a fraction $1/b$ on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size $1/b$ and that the endpoint of the part based at 0 locates the number $1/b$ on the number line.
MATH.3.NF.A.2.b	Represent a fraction a/b on a number line diagram by marking off a lengths $1/b$ from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line.
MATH.3.NF.A.3.b	Recognize and generate simple equivalent fractions by reasoning about their size, (e.g., 1/2 = 2/4, 4/6 = 2/3). Explain why the fractions are equivalent with the support of a visual fraction model.
MATH.3.NF.A.3.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 with the support of a visual fraction model.
MATH.3.M.A	Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects
MATH.3.M.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.
MATH.3.M.A.2	Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.

MATH.3.M.B.5.a	Find the area of a rectangle with whole-number side lengths by tiling it and show that the area is the same as would be found by multiplying the side lengths.
MATH.3.M.B.5.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.
MATH.3.M.C	Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures
MATH.3.M.C.6	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.
MATH.3.DL.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.
MATH.3.G.A	Reason with shapes and their attributes
MATH.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.
MATH.3.G.A.2	Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole.
ELA.SL.PE.3.1	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.
ELA.SL.PE.3.1.B	Follow agreed-upon norms for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).
ELA.SL.PE.3.1.C	Ask questions to check understanding of information presented, stay on topic, and link their comments to the remarks of others.
ELA.SL.PE.3.1.D	Explain their own ideas and understanding in light of the discussion.
ELA.SL.ES.3.3	Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.
ELA.SL.PI.3.4	Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.
ELA.SL.AS.3.6	Speak in complete sentences when appropriate to task and situation in order to provide requested detail or clarification.
WRK.K-12.P.1	Act as a responsible and contributing community members and employee.
WRK.K-12.P.4	Demonstrate creativity and innovation.
WRK.K-12.P.5	Utilize critical thinking to make sense of problems and persevere in solving them.
TECH.9.4.5.CI	Creativity and Innovation
TECH.9.4.5.IML.2	Create a visual representation to organize information about a problem or issue (e.g., 4.MD.B.4, 8.1.5.DA.3).

Suggested Strategies for Modification

Possible accommodations/modification for Third Grade

Note: Teachers can find more specific modifications for English learners, learners with special needs, learners reading below grade level, and advanced learners on the Ready Math website.