Kenmore-Town of Tonawanda UFSD

We educate, prepare, and inspire all students to achieve their highest potential

Grade 2 Module 8
Parent Handbook

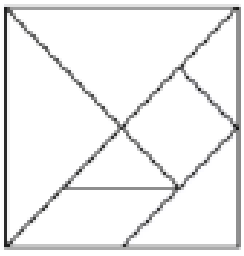
The materials contained within this packet have been taken from the Great Minds curriculum Eureka Math.

Eureka Math™ Tips for Parents

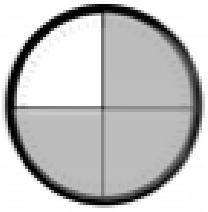
Grade 2
Module 8

Time, Shapes, and Fractions as Equal Parts of Shapes

In this final Module of the year, students extend their understanding of part-whole relationships through the lens of geometry. As students compose and decompose shapes, they begin to develop an understanding of unit fractions (fractions with one in the numerator) as equal parts of a whole.



A tangram puzzle: In Module 8, students will cut out the shapes, name them, and use them to compose composite shapes.



Relating fractional parts of a circle to minutes on the clock

What Came Before this Module:

In Module 7, students worked extensively with data and measurement. They gathered data and represented it in various ways, measured in standard and metric units, and solved addition and subtraction problems with money (both coins and bills).

New Terms in this Module:

a.m./p.m.

Analog Clock/Digital Clock

Angle—e.g., figure formed by the corner of a polygon

Parallel—two lines on the same plane are parallel if they do not intersect

Parallelogram—quadrilateral with both pairs of opposite sides parallel

Polygon—closed figure with three or more straight sides, e.g., triangle, quadrilateral, pentagon, hexagon

Quadrilateral—four-sided polygon, e.g., square, rhombus, rectangle, parallelogram, trapezoid

Quarter past, quarter to—as relating to time and the clock

Right angle—e.g., a square corner

Third of (shapes), thirds—three equal shares

A Whole can be made up of 2 halves, 3 thirds, or 4 fourths

+ How You Can Help at Home:

- It's time to practice telling time! Using an analog clock, help your student practice telling time to the nearest 5 minutes.
- When drawing simple shapes, have your student practice dividing them into halves, thirds, and fourths (emphasizing equal-sized pieces).

Key Common Core Standards:

- *Work with time.*
  - Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.
- *Reason with shapes and their attributes.*
  - 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.
  - Partition circles and rectangles into two, three, or four equal shares.

Prepared by Erin Schweng, Math Coach

(Above) Tangrams, pattern block puzzle pieces that students use as described below in Module 8

(Above) Using pattern blocks to create composite shapes

Spotlight on Math Strategies:

Pattern Blocks

Students will use these blocks to compose shapes in this module of *A Story of Units*.

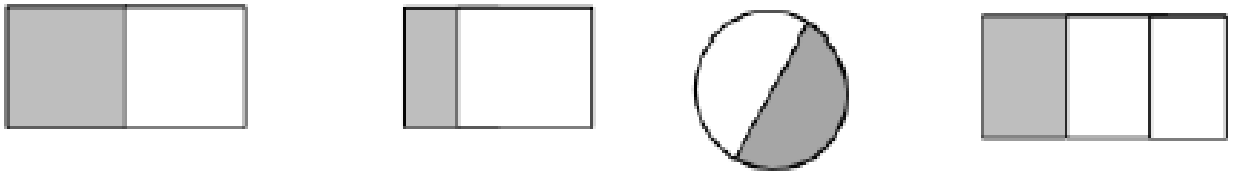
A Story of Units has several key mathematical strategies that will be used throughout a student's elementary years.

This module builds on the basic understanding students have about shapes earlier in *A Story of Units* and stretches their skills to see how to combine and create the shapes they know into new, composite shapes. Pattern blocks are not exclusive to *A Story of Units*. They are tools that have been used to support math learning for many generations of students.

In this module, students use the proper names of all the pattern block shapes: triangle, hexagon, trapezoid, and square and rhombus (two examples of quadrilaterals). We will also use the pattern blocks to notice the attributes of each shape, e.g., number of sides, angles, side lengths, etc. Finally, students divide the shapes into equal parts, focusing on halves, thirds, and fourths.

Sample Problem from Module 7, Lesson 9:

Circle the shapes that have 2 equal shares with 1 share shaded.



Grade 2 • Module 8

Time, Shapes, and Fractions as Equal Parts of Shapes

OVERVIEW

In Module 8, the final module of the year, students extend their understanding of part–whole relationships through the lens of geometry. As students compose and decompose shapes, they begin to develop an understanding of unit fractions as equal parts of a whole.

In Topic A, students build on their prior knowledge of a shape's defining attributes (**1.G.1**) to recognize and draw categories of polygons with specified attributes: the number of sides, corners, and angles (**2.G.1**). For example, students see that a rectangle has four straight sides, four right angles, and opposite sides with equal length. Students then relate the square, a special rectangle, to the cube by building a cube from six congruent squares. They describe the cube in terms of its attributes, counting the number of edges, faces, and corners (**2.G.1**). Once students are able to describe and analyze polygons and the cube according to their attributes in Topic A, they are ready to combine shapes and build composite shapes in Topic B.

Topic B opens with students using a tangram, a set of seven shapes that compose a square, to create a new shape. Students see that they can arrange two-dimensional shapes to create a new whole, or composite, shape, which can become part of an even larger whole. As students progress through the topic, they build and partition shapes by combining two or more smaller shapes and relating the parts to the whole. For example, they use different pattern blocks to show that a regular hexagon might be composed of two trapezoids or three rhombuses. One might say, "This hexagon is made from two identical trapezoids, or two equal parts." This allows for interpreting equal shares of a whole as a fraction as students name the equal parts *halves*, *thirds*, or *fourths* (**2.G.3**).

Next, in Topic C, students decompose circles and rectangles into equal parts and describe them as halves (a half of), thirds (a third of), and fourths (a fourth of) or quarters (**2.G.3**). For example, students see that a circle can be partitioned into four quarter-circles, or parts, which can be described as fourths. They learn to describe the whole by the number of equal parts. For example, one whole circle is composed of 4 fourths. Finally, students decompose a rectangle into four parts that have equal areas but different shapes (**2.G.3**).

The module closes with Topic D, where students apply their understanding of partitioning the whole into halves and fourths to tell time to the nearest five minutes (**2.G.3**, **2.MD.7**) using both analog and digital clocks. They construct simple clocks and see the relationship to partitioning a circle into quarters and halves, thereby decomposing 60 minutes. For example, 3 fourths of the circle can be interpreted as 3 intervals of 15 minutes; that is, 15 + 15 + 15 = 45 (**2.NBT.5**, **2.NBT.6**), or 45 minutes. They also use their understanding of skip-counting by fives and tens to tell time on an analog clock (**2.NBT.2**). Finally, students apply their learning by calculating time intervals of hours and half hours and close the year by determining the time interval in days until they become third graders.

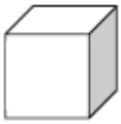
Terminology

New or Recently Introduced Terms

- a.m./p.m.
- Analog clock
- Angle (e.g., a figure formed by the corner of a polygon)
- Parallel (used to describe opposite sides of a parallelogram, e.g., “These sides are parallel because if they kept on going, they’d never intersect!”)
- Parallelogram (a quadrilateral with both pairs of opposite sides parallel)
- Partition (used in reference to partitioning rectangles, e.g. "Let's partition this rectangle to make an array" or "Let's partition this tape to show the money that was spent and the money that was left. Which part will be longer?")
- Pentagon (a two-dimensional figure enclosed by five straight sides and five angles)
- Polygon (a closed figure with three or more straight sides, e.g., triangle, quadrilateral, pentagon, hexagon)
- Quadrilateral (a four-sided polygon, e.g., square, rhombus, rectangle, parallelogram, trapezoid)
- Quarter past, quarter to
- Right angle (e.g., a square corner)
- Third of (shapes), thirds (three equal shares)
- Whole (used in reference to fractions, e.g., 2 halves make 1 whole, and 3 thirds make 1 whole)

Familiar Terms and Symbols

- Attributes (the characteristics of an object such as number of sides, angles, or faces)
- Cube (a three-dimensional shape composed of six squares)



- Digital clock
- Face (a two-dimensional side of a three-dimensional shape)
- Fourth of (shapes), fourths (four equal shares)
- Half hour (an interval of time lasting 30 minutes)
- Half of (shapes), halves (two equal shares)
- Half past (an expression for 30 minutes past a given hour)
- Hour (a unit for measuring time, equivalent to 60 minutes or 1/24 of a day)
- Minute (a unit for measuring time, equivalent to 60 seconds or 1/60 of an hour)
- O’clock (used to indicate time to a precise hour with no additional minutes)
- Quarter of (shapes), quarters (four equal shares)
- Tangram (a special set of puzzle pieces with five triangles and two quadrilaterals that compose a square)
- Two-dimensional shapes (familiar prior to Grade 2):
- Circle
- Half-circle
- Hexagon (a two-dimensional figure enclosed by six straight sides and six angles)
- Quarter-circle
- Rectangle (a two-dimensional figure enclosed by four straight sides and four right angles)
- Rhombus (a two-dimensional figure enclosed by four straight sides of the same length)
- Square (a rectangle with four sides of the same length)
- Trapezoid (a two-dimensional figure enclosed by four straight sides with at least one pair of parallel sides)
- Triangle (a two-dimensional figure enclosed by three straight sides and three angles)

Suggested Tools and Representations

- Cube: a three-dimensional shape (real-world examples such as a die, alphabet blocks, or a box)
- Geoboards
- Large instructional geared clock
- Pattern blocks
- Personal white boards
- Rulers
- Spaghetti
- Student clocks, preferably those with gears that can provide the appropriate hour-hand alignment
- Tangrams
- Toothpicks

Grade 2 Module 8 Topic A

Attributes of Geometric Shapes

Focus Standard:

2.G.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. (Sizes are compared directly or visually, not compared by measuring.)

Instructional Days Recommended: 5

In Module 8, students continue to develop their geometric thinking from Grade 1, progressing from a descriptive to an analytic level of thinking where they can recognize and characterize shapes by their attributes and properties.

In Lesson 1 of Topic A, students describe various two-dimensional shapes according to specified attributes, such as the number of sides or angles (**2.G.1**). The names of the shapes are intentionally omitted in this lesson in order to encourage students to use precise language in their descriptions. Students must attend to a shape's defining attributes in order to describe the difference between shapes. For example, rather than describing a shape as a quadrilateral, students describe it as a shape having four sides and four angles. In this lesson, students come to see the corner of a polygon as an angle. In Lesson 4, the right angle is introduced as a square corner. After students name the attributes of shapes, they use geoboards to create a shape given its attributes.

In Lesson 2, students build various polygons as they name them based on attributes. Using uncooked spaghetti of various lengths, they build a triangle, quadrilateral, pentagon, and hexagon (**2.G.1**), adding another piece of spaghetti for each construction. They then identify a collection of various polygons, both exemplars and variants of shapes (as shown below), including those with sides of unequal length. As they analyze shapes, the students expand their bank of mental images associated with names of shapes. Hence, this task serves to broaden, rather than limit, their understanding and to clarify common misconceptions about shapes.

Now that they have created, manipulated, and named shapes, students are ready to draw their own in Lesson 3. This lesson focuses on the four categories of polygons that students built in Lesson 2: triangles, quadrilaterals, pentagons, and hexagons. After the teacher-guided portion of the lesson, students use a ruler to draw straight lines and to create their own shapes, before trading with a partner. Partners take turns naming and analyzing shapes according to their attributes.

In Lesson 4, students use various attributes (e.g., side length, parallel lines, right angles) to identify different quadrilaterals. Along with recognizing trapezoids and rhombuses, seen in Grade 1, students are introduced to parallelograms. They learn to recognize parallel sides and square corners and to name quadrilaterals based on these attributes. For example, students might be questioned and guided as follows: "Draw a quadrilateral with both pairs of opposite sides parallel. We call this a parallelogram." Next, "Now, draw a quadrilateral with both pairs of opposite sides parallel and four square corners, or right angles. We call this a rectangle." Then, the teacher might continue with, "Can you draw another quadrilateral that also has opposite sides parallel, but this time use your ruler to show that all sides are equal? We call this a rhombus." While students learn the various names of shapes, the emphasis remains on analyzing shapes based on their varied. In doing so, students begin to notice the similarities and differences between various quadrilaterals.

Finally, in Lesson 5, students focus solely on the square and build its three-dimensional counterpart, the cube. In this lesson, students use toothpicks of equal length and an adhesive (e.g., sticky tack) to construct a cube. After first creating a square and naming its attributes, students are tasked with building a cube with only a
picture to guide them. After constructing the cube, students count the number of corners, and they see that right angles are formed at each corner. Then, they create faces for their cube by tracing the cube's bottom on a piece of paper, discovering that they need to trace six squares to cover the cube. Finally, with teacher guidance and modeling, students practice drawing cubes (**2.G.1**). From this lesson, students see a square as a face of the cube.

**The sample homework responses contained in this manual are intended to provide insight into the skills expected of students and instructional strategies used in Eureka Math.*

Lesson 1

Objective: Describe two-dimensional shapes based on attributes.

Homework Key

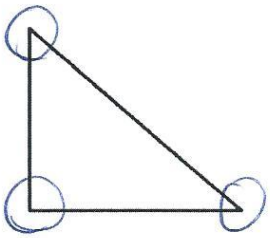
1. a. 3 sides, 3 angles
   b. 4 sides, 4 angles
   c. 5 sides, 5 angles
   d. 8 sides, 8 angles
   e. 6 sides, 6 angles
   f. 4 sides, 4 angles
   g. 7 sides, 7 angles
   h. 11 sides, 11 angles
   i. 6 sides, 6 angles

2. a. A
   b. D
   c. E
   d. 6
   e. All

3. Both shapes on the right of the board shaded; shape on the left circled; explanations will vary.

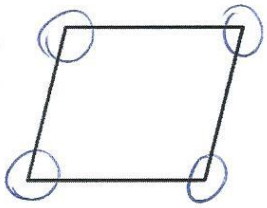
Homework Sample

1. Identify the number of sides and angles for each shape. Circle each angle as you count, if needed.

a. 

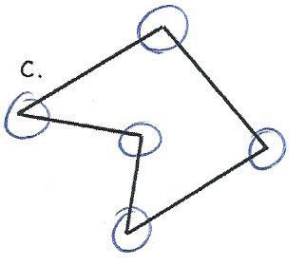
3 sides

3 angles

b. 

4 sides

4 angles

c. 

5 sides

5 angles

Lesson 2

Objective: Build identify, and analyze two-dimensional shapes with specified attributes.

Homework Key

1. a. Quadrilateral
b. Triangle
c. Quadrilateral
d. Pentagon
e. Pentagon
f. Hexagon
g. Quadrilateral
h. Quadrilateral
i. Hexagon
j. Quadrilateral
k. Pentagon
l. Triangle

2. a. 2; 4
2 lines drawn to complete each quadrilateral
b. 3; 5
3 lines drawn to complete each pentagon
c. 1; 3
1 line drawn to complete each triangle
d. 4; 6
4 lines drawn to complete each hexagon

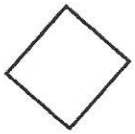
3. Explanations will vary.

4. Explanations will vary.

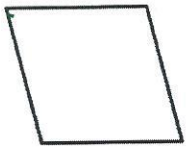
Homework Sample

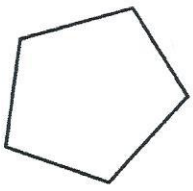
1. Count the number of sides and angles for each shape to identify each polygon. The polygon names in the word bank may be used more than once.

Hexagon	Quadrilateral	Triangle	Pentagon

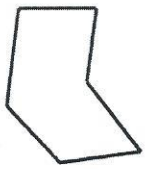
a. 
Quadrilateral

b. 
Triangle

c. 
Quadrilateral

d. 
Pentagon

e. 
Pentagon

f. 
Hexagon

Lesson 3

Objective: Use attributes to draw different polygons including triangles, quadrilaterals, pentagons, and hexagons.

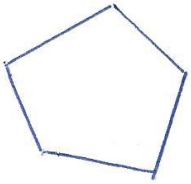
Homework Key

1. Drawings will vary on all answers.
   a. 4; quadrilateral
   b. 6; hexagon
   c. 3; triangle
   d. 5; pentagon
2. Answers will vary.

Homework Sample

Use a straightedge to draw the polygon with the given attributes in the space to the right.

Draw a five-sided polygon.

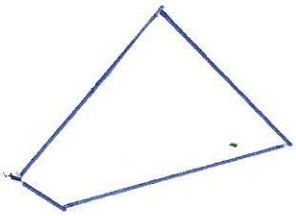


Number of angles: 5

Name of polygon: Pentagon

1. Use a straightedge to draw the polygon with the given attributes in the space to the right.

   a. Draw a polygon with 4 angles.



   Number of sides: 4

   Name of polygon: Quadrilateral

Lesson 4

Objective: Use attributes to identify and draw different quadrilaterals including rectangles, rhombuses, parallelograms, and trapezoids.

Homework Key

1. 2 parallel lines of different lengths drawn
2. 2 parallel lines of the same length drawn
3. Parallelogram drawn and named
4. Rectangle drawn and named
5. Answers will vary.
6. Total colored red quadrilaterals: 2
   Total colored blue quadrilaterals: 2
   Total circled green quadrilaterals: 10

Homework Sample

1. Use your ruler to draw 2 parallel lines that are not the same length.

2. Use your ruler to draw 2 parallel lines that are the same length.

5. A square is a special rectangle. What makes it special?

All 4 of the sides have equal length.

Lesson 5

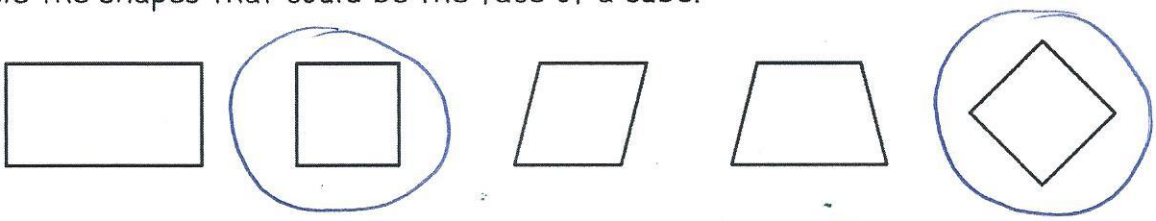
Objective: Relate the square to the cube, and describe the cube based on attributes.

Homework Key

1. Square circled
2. Square
3. 8
4. 12
5. 6
6. Drawings will vary.
7. Lines connected to make cubes
8. Explanations will vary.

Homework Sample

1. Circle the shapes that could be the face of a cube.



2. What is the most precise name of the shape you circled? Square

3. How many corners does a cube have? 8

4. How many edges does a cube have? 12

5. How many faces does a cube have? 6

Grade 2 Module 8 Topic B

Composite Shapes and Fraction Concepts

Focus Standard:

2.G.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.

Instructional Days Recommended: 3

In Topic B, students build and partition composite shapes, exploring fraction concepts as they identify the relationships between parts and wholes.

Students see in Lesson 6 that the tangram puzzle (shown above) is composed of many smaller two-dimensional shapes. As students cut out the various shapes within the tangram, they name them. They explore the variety of ways they can compose new shapes by repositioning the pieces. For example, students see that a larger triangle can be composed of two right triangles and a square, which can also be repositioned to form a trapezoid, parallelogram, or rectangle (as shown below). Further, students see that the composite triangle pictured below can be placed next to another triangle to form a larger square.

In Lesson 7, students interpret equal shares within composite shapes. They begin by using the tangram pieces from the previous day to show how the two smallest triangles can be positioned to form a larger triangle, parallelogram, or square (as shown below). Each of these composite shapes is composed of two equal shares, described as halves. By the end of Lesson 7, students experiment with pattern blocks to see, for example, how three triangle blocks can be combined to form a trapezoid.

Thus, the trapezoid can be partitioned into three equal shares, with each share described as a third of the whole, as shown below (**2.G.3**).

In Lesson 8, students continue to use pattern blocks to build composite shapes from equal parts. For example, they see that a regular hexagon can be composed from two trapezoids, representing two equal shares, or halves. Alternatively, the hexagon can also be composed of three rhombuses (as shown below), described as thirds, or six same-size equilateral triangles. Students also use four square-inch tiles to compose a larger square and describe each part as a fourth (**2.G.3**).

Lesson 6

Objective: Combine shapes to create a composite shape; create a new shape from composite shapes.

Homework Key

1. a. Parallelogram
   b. Triangle
   c. Square
2. a. Drawing of a right triangle
   b. Drawing of a rectangle
   c. Drawing of a parallelogram
   d. Drawing of a trapezoid
3. Drawings will vary.
4. Drawings will vary.

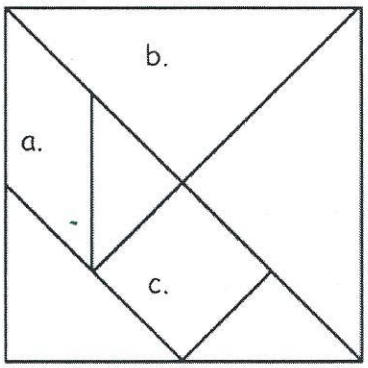
Homework Sample

1. Identify each polygon labeled in the tangram as precisely as possible in the space below.

   a. parallelogram

   b. triangle

   c. Square



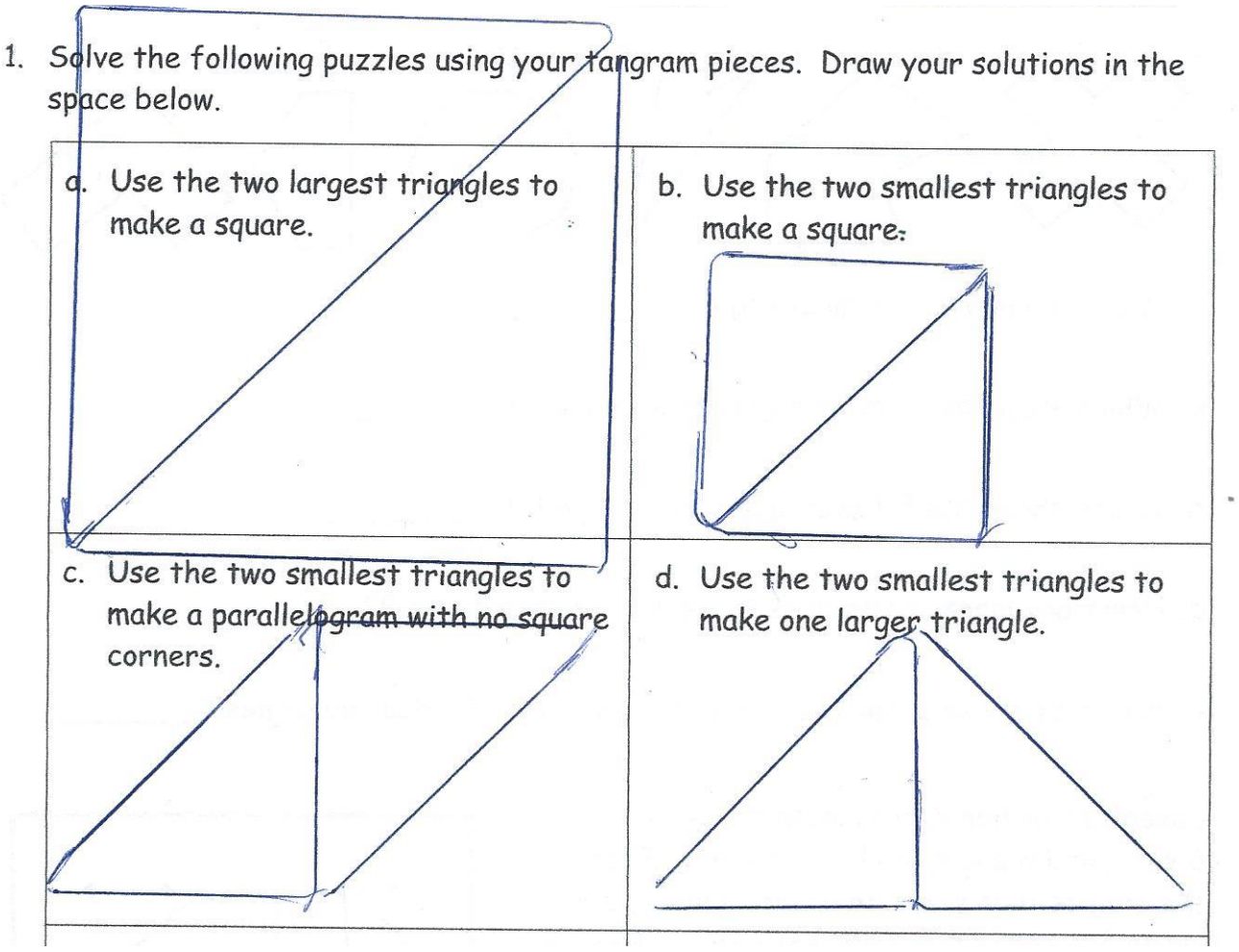
Lesson 7 - 8

Objective: Interpret equal shares in composite shapes as halves, thirds, and fourths.

Homework Key (7)

1. a. Square drawn
   b. Square drawn
   c. Parallelogram drawn
   d. Triangle drawn
   e. 2
   f. 2
2. Triangle, parallelogram, and hexagon circled
3. a. 3
   b. 3
4. Rectangle and hexagon circled
5. a. 4
   b. 4
6. Hexagon and rectangle circled

Homework Sample



Lesson 8

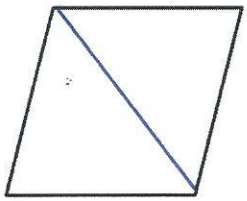
Homework Key

1. Triangle
   2 triangles drawn within the rhombus
2. Trapezoid
   2 trapezoids drawn within the hexagon
3. Parallelogram
   3 parallelograms drawn within the hexagon
4. Triangle
   3 triangles drawn within the trapezoid
5. Square; 4 squares drawn within the square
   a. Fourth
   b. Fourths
   c. Half
   d. 4
6. Triangle; 6 triangles drawn within the hexagon

Homework Sample

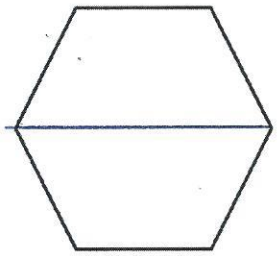
1. Name the pattern block used to cover half the rhombus. the triangle

   Sketch the 2 pattern blocks used to cover both halves of the rhombus.



2. Name the pattern block used to cover half the hexagon. trapezoid

   Sketch the 2 pattern blocks used to cover both halves of the hexagon.



Grade 2 Module 8 Topic C

Halves, Thirds, and Fourths of Circles and Rectangles

Focus Standard:

2.G.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.

Instructional Days Recommended: 4

Topic C focuses on partitioning circles and rectangles into equal fractional parts. In Lesson 9, students are introduced to partitioning shapes into two equal shares, or halves, using both circles and rectangles. First, partners choose different ways to fold a sheet of paper in half. Then, they label and share their halves, discovering that though they each folded their rectangle differently, they each have two equal parts of the original whole. Next, they cut out a circle and fold, color, and label one half. They then rotate their circles and discover that halves are determined by equal parts, not by the orientation of the line. Finally, students look at pictures of partitioned shapes and discuss whether the shaded (or unshaded) portion is or is not two equal shares. To encourage student reasoning about equal shares, a variety of partitions and orientations are used.

Lesson 10 continues the same process with thirds and fourths. Students learn to decompose a whole into three equal parts to create thirds. They create fourths by splitting two halves into two equal parts. Given a variety of partitioned shapes, students are asked to determine how many thirds or fourths are represented by the shaded (or unshaded) portion. Lesson 10 ends with students synthesizing their understanding of halves, thirds, and fourths by partitioning a pizza and a rectangular sheet cake, making decisions based on their share of the pizza or cake.

In Lesson 11, students build upon their new knowledge by assembling a whole out of fractional parts. Given a circle made of two parts, students see that the whole circle is composed of 2 halves. Similarly, they see that a whole rectangle cut into thirds is made of 3 thirds, or that a square cut into fourths is made of 4 fourths.

Topic C concludes with Lesson 12, in which students continue to explore the concept that equal parts of a rectangle can have different shapes. Using geoboards, students might partition a given rectangle into two squares, two rectangles, or even two triangles. In each case, students describe the parts as halves. In addition, students partition a square paper into differently shaped fourths and explain how one of the fourths (the square shape) can be transformed into the other fourth (the rectangle shape), as shown below.

This topic provides a foundation for Topic D, applying what students have learned about fractional parts of a circle, particularly halves and quarters, to telling time on an analog clock.

**The sample homework responses contained in this manual are intended to provide insight into the skills expected of students and instructional strategies used in Eureka Math.*

Lesson 9 - 10

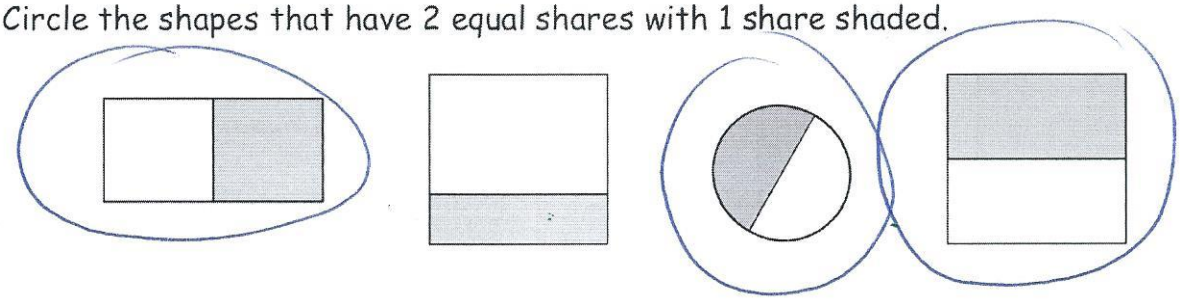
Objective: Partition circles and rectangles into equal parts, and describe those parts as halves, thirds, or fourths.

Homework Key (9)

1. First, third, and fourth shapes circled
2. Shapes (e), (f), (g), and (h) shaded
3. Partitions and shadings will vary.

Homework Sample

1. Circle the shapes that have 2 equal shares with 1 share shaded.



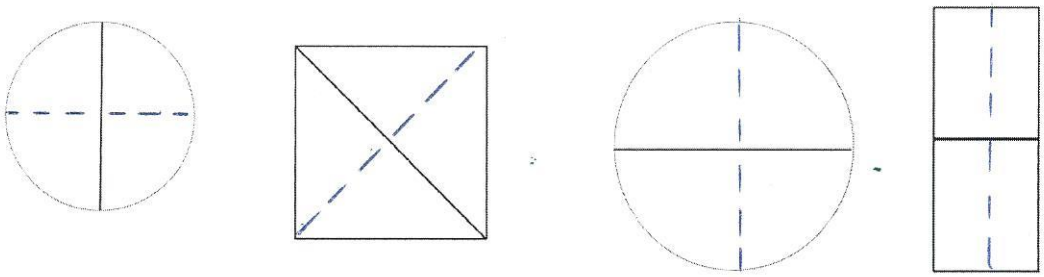
Lesson 10

Homework Key

1. a. Halves
   b. 1 line drawn in each shape to partition into fourths
2. 2 lines drawn, shape shaded to show the appropriate fraction
3. Circles partitioned by 2 perpendicular lines, appropriate number of segments shaded
4. a. 1 line drawn to make halves, 1 part shaded
   b. Horizontal and/or vertical lines drawn to partition into fourths, 1 part shaded
   c. 2 lines drawn to partition into thirds, 1 part shaded
   d. Perpendicular lines drawn to partition into fourths, 2 parts shaded
   e. 1 line drawn to make halves, both parts shaded
   f. 2 lines drawn to partition into thirds, 2 parts shaded
   g. 2 lines drawn to partition into thirds, 3 parts shaded
   h. Perpendicular lines drawn to partition into fourths, 3 parts shaded
   i. 1 line drawn in each square to make halves, 3 parts shaded
5. Circle partitioned into thirds, labeled with the three boys' names; 3 thirds

Homework Sample

1. a. Do the shapes below show halves or thirds? halves



b. Draw 1 more line to partition each shape above into fourths.

Lesson 11

Objective: Describe a whole by the number of equal parts including 2 halves, 3 thirds, and 4 fourths.

Homework Key

1. a. 1; 2
   b. Second circle circled
   c. 1; 2; 3
   d. Third rectangle circled
   e. 1; 4; 3; 2
   f. Second rectangle circled

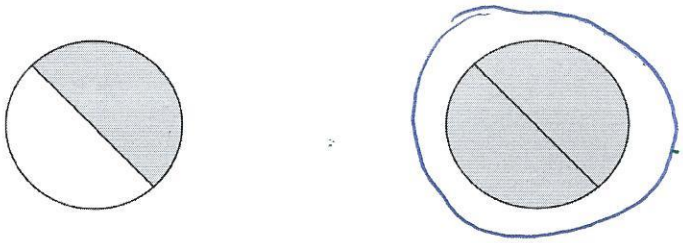
2. a. 1 half
   b. 2 thirds
   c. 3 fourths
   d. 2 fourths
   e. 2 fourths
   f. 1 half

3. a. 1 half drawn to complete the shape
   b. 2 thirds drawn to complete the shape
   c. 3 fourths drawn to complete the shape

Homework Sample

1. For Parts (a), (c), and (e), identify the shaded area.

a.

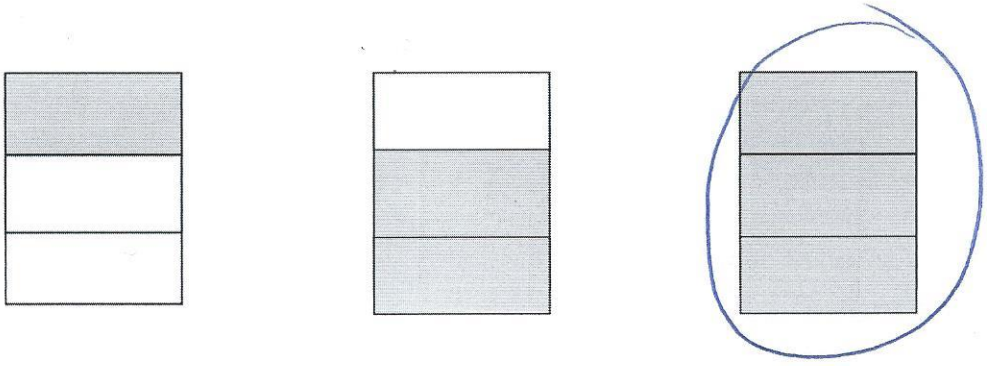


1 half

2 halves

b. Circle the shape above that has a shaded area that shows 1 whole.

c.



1 third

2 thirds

3 thirds

Lesson 12

Objective: Recognize that equal parts of an identical rectangle can have different shapes.

Homework Key

1. a. Rectangles partitioned into halves horizontally and vertically
   b. Rectangles partitioned into thirds horizontally and vertically
   c. Rectangles partitioned into fourths horizontally and vertically
   d. Rectangles partitioned into halves horizontally, vertically, or diagonally
   e. Rectangles partitioned into thirds horizontally and vertically
   f. Rectangles partitioned into fourths horizontally, vertically, or diagonally
2. Drawings will vary.

Homework Sample

1. Partition the rectangles in 2 different ways to show equal shares.

   a. 2 halves

Grade 2 Module 8 Topic D

Application of Fractions to Tell Time

Focus Standards:

2.MD.7	Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.
2.G.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.

Instructional Days Recommended: 4

In Topic D, students apply fraction and skip-counting skills to telling time. The topic starts with Lesson 13, in which students make paper clocks from templates. After a brief review of the clock using a geared instructional clock, students fold their paper clock face in half and trace along the fold line to delineate the 2 halves. They then mark the top of the fold with 12 and the bottom with 6. Students next fold the clock in half again so that the two fold points meet, creating quarters. Students trace along this second fold line and mark 3 and 9 at the new fold points. In the end, they label the remaining numbers and attach hands in order to use it as a practice clock.

Having constructed this tool, students then practice telling time to the nearest half and quarter hour. They relate 30 minutes to a half hour and 15 minutes to a quarter hour, associating, for example, “half past 7” with 7:30 or 2:45 with “a quarter to 3.”

In Lesson 14, students start to relate each of the 12 numbers on the clock face to intervals of 5 minutes. They use skip-counting to count up to and down from 60 by fives in preparation for telling time to the nearest 5 minutes. Next, they learn to tell time by counting numbers on the clock face for the minute hand, as well as relating the position of the hour hand to the correct hour.

Lesson 15 continues the same process, now adding the complexity of a.m. and p.m. Students view pictures showing everyday activities along with the time represented in digital clock form. They determine whether the time shown in the picture would be a.m. or p.m.

In Lesson 16, students apply their subtraction skills to solve problems involving time intervals. Given two times, they must calculate how much time has passed between them, whether in whole hours or a half hour (e.g., the elapsed time between 3:00 p.m. and 7:00 p.m. or 6:30 a.m. and 7:00 a.m.). Finally, they close the year determining the time interval in days before they become third-graders.

**The sample homework responses contained in this manual are intended to provide insight into the skills expected of students and instructional strategies used in Eureka Math.*

Lesson 13

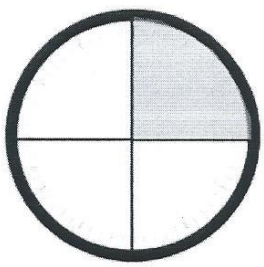
Objective: Construct a paper clock by partitioning a circle into halves and quarters, and tell time to the half hour or quarter hour.

Homework Key

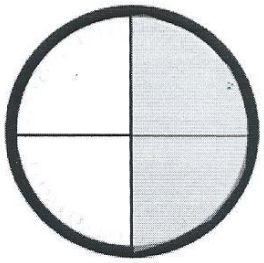
1. 1 quarter; 2 quarters or 1 half; 3 quarters; 4 quarters or 2 halves
2. a. 6:45
   b. 12:30
   c. 10:45
   d. 9:15
3. Line drawn from time to corresponding clock
4. Minute hand drawn pointing to 6 (3:30), 9 (11:45), and 3 (6:15), respectively

Homework Sample

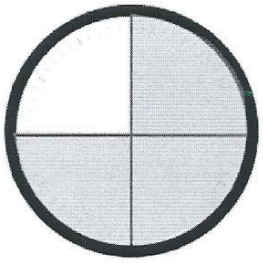
1. Tell what fraction of each clock is shaded in the space below using the words *quarter, quarters, half,* or *halves.*



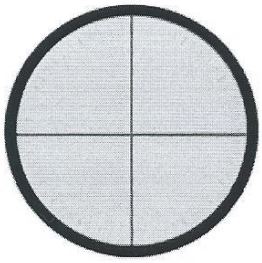
1 quarter



1 half or 2 quarters



3 quarters



4 quarters or 2 halves

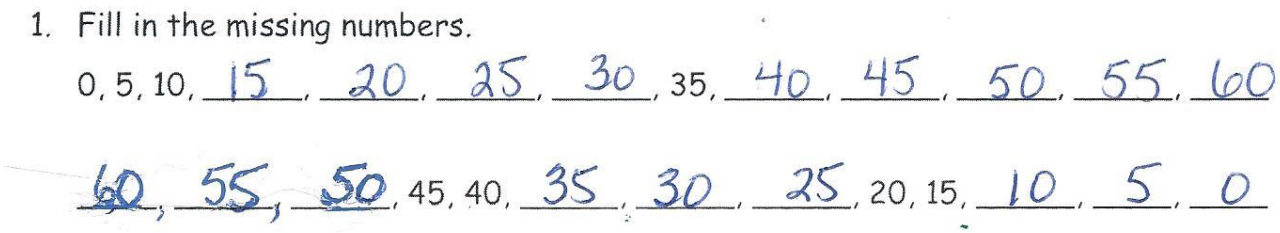
Lesson 14

Objective: Tell time to the nearest five minutes.

Homework Key

1. 15, 20, 25, 30; 40, 45, 50, 55, 60
   60, 55, 50; 35, 30, 25; 10, 5, 0
2. First two answers provided, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60
3. Minute hand drawn to show 3:25, 7:15, and 9:55, respectively
4. Hour hand drawn to show 12:30, 10:10, and 3:45, respectively
5. Hands drawn to show 6:55, 1:50, 8:25, 4:40, 7:45, and 2:05, respectively
6. 1:35; 10:05

Homework Sample



Lesson 15

Objective: Tell time to the nearest five minutes; relate *a.m.* and *p.m.* to time of day.

Homework Key

1. a. a.m.
   b. p.m.
   c. p.m.
   d. a.m.
   e. p.m.
   f. a.m. or p.m.
   g. p.m.
   h. p.m.
2. a. 7 a.m.
   b. 8:25 p.m.
3. a. Hands drawn to show 8:15; p.m. circled
   b. Hands drawn to show 12:30; p.m. circled
4. Answers will vary.

Homework Sample

1. Decide whether the activity below would happen in the a.m. or the p.m. Circle your answer.

a. Eating breakfast **a.m.** / p.m.	b. Doing homework a.m. / **p.m.**
c. Setting the table for dinner a.m. / **p.m.**	d. Waking up in the morning **a.m.** / p.m.
e. After-school dance class a.m. / **p.m.**	f. Eating lunch a.m. / **p.m.** (this may vary)
g. Going to bed a.m. / **p.m.**	h. Heating up dinner a.m. / **p.m.**

Lesson 16

Objective: Solve elapsed time problems involving whole hours and a half hour.

Homework Key

1.
   a. 6 hours
   b. 4 and a half hours, or 4 hours and 30 minutes
   c. 6 and a half hours, or 6 hours and 30 minutes
   d. 7 hours 30 minutes
   e. 4 and a half hours, or 4 hours and 30 minutes
   f. 5 hours
   g. 3 and a half hours, or 3 hours and 30 minutes
   h. 2 and a half hours, or 2 hours and 30 minutes

2.
   a. 3 and a half hours, or 3 hours and 30 minutes
   b. 6:00 p.m.
   c. 3:30 p.m.
   d. 10 and a half hours, or 10 hours and

Homework Sample

1. How much time has passed?
   a. 2:00 p.m. → 8:00 p.m. — 6 hours
   b. 7:30 a.m. → 12:00 p.m. (noon) — 4 hours and 30 minutes
   c. 10:00 a.m. → 4:30 p.m. — 6 and a half hours
   d. 1:30 p.m. → 8:30 p.m. — 7 hours
   e. 9:30 a.m. → 2:00 p.m. — 4 and a half hours