Excerpt from Lesson 2: Lesson Objective: Build, identify, and analyze two-dimensional shapes with specified attributes.

Concept Development (33 minutes)

Materials:  (T) 4 charts from G2–M8–Lesson 1, tape, sentence strips with shape names (triangle, quadrilateral, pentagon, hexagon)  (S) Container of uncooked spaghetti of differing lengths per each group of four students, 1 piece of dark construction paper per student

Note: The polygon is described first, as the other listed descriptions stem from it. The descriptions provided here provide a solid foundation to the definitions that will be part of students’ experience in later grades.

When introducing the term polygon, show images of polygons and summarize by saying that they are closed shapes that are made up of some number of straight sides. Polygon and other shape descriptions are given below.

Polygon: Made up of line segments called sides. Every side meets exactly two other sides at the corners. A polygon always has the same number of angles as sides.

Triangle: A three-sided polygon with three angles.

Quadrilateral: A four-sided polygon with four angles.

Pentagon: A five-sided polygon with five angles.

Hexagon: A six-sided polygon. It also has six angles.

Prior to the lesson, arrange students in groups of four with a container of spaghetti for building shapes and 1 piece of dark construction paper per student.

T: Take two pieces of spaghetti of any length out of the container. Let’s call these our sides. On your paper, arrange the spaghetti so that the two sides meet to make an angle.

S: (Arrange their spaghetti pieces into an open shape, shown at right.)

T: Take another piece of spaghetti and close the shape creating two more corners or angles.

S: (Complete the shape.)

T: Name the shape you just made.

S: Triangle.

T: Yes. Shapes can be described with more than one name. We can also use the word polygon to describe the triangle. A polygon is a closed shape with three or more angles, so a triangle is the smallest polygon.

T: Can you think of other shapes that are polygons?


T: (Draw an open shape with two sides on the board, pointing to one side.) How many sides meet this one?

S: Only one.
Excerpt from Lesson 2, Continued

T: Is this a polygon?
S: No! It only has one angle. → It’s not closed!
T: How can we turn this into a polygon?
S: Add another side?
T: Yes, I can add another side to close the shape like this. (Draw a line to complete the triangle.)
T: Turn and talk: This is a polygon. How do we know?
S: It’s closed. → It has three angles. → It’s a triangle, and that’s a polygon.
T: You’re right! Today we are going to name our shapes based on their attributes, or characteristics.
   (Hold up the word triangle.) Listen carefully: Tri- means three. So, a triangle is a shape with...
S: Three angles!
T: (Reveal Chart 1 from yesterday’s lesson.) Here is the chart we made yesterday. A shape with three sides and three corners, or angles, can be named...
S: A triangle!
T: (Tape the triangle card to the top of Chart 1.)
S: What do you notice about these triangles and the one on your paper?
S: They don’t all look the same. → They all have three sides and three corners, or angles. → Not all triangles look like this (points to an equilateral triangle). → I noticed that not all the sides are the same length; some are long, and some are short.
T: Good. So, even though they don’t look the same, they are all triangles because they all have three sides and three corners, or angles.
T: Take another piece of spaghetti and make a closed shape with four sides.
S: (Build a quadrilateral. Due to the differing lengths of spaghetti the quadrilateral should be irregular and not as easy to name as a square or rectangle would be.)
T: Can you name the shape you made?
S: No, but it has four sides and four angles.
T: You just built another polygon, called a quadrilateral! (Hold up the word quadrilateral on a sentence strip.) Quad- means four. Lateral refers to sides. When we say quadrilateral, we’re talking about a polygon with four sides.
T: (Reveal Chart 2 from yesterday’s lesson.) What can we label our chart that has shapes with four sides and four angles?
S: Quadrilaterals!
T: (Tape the quadrilateral card to the top of Chart 2.)
T: What do you notice about these quadrilaterals and the one on your paper?
S: They all have four sides, corners, and angles. → Some look like shapes I know, but some look different. → Some have equal sides, but some don’t.
T: Good. The reason why these shapes are quadrilaterals is because of their shared attributes, not because of the way they look. These all have four straight sides, so they are...
S: Quadrilaterals!
Excerpt from Lesson 2, Continued

Continue to add a fifth and sixth piece of spaghetti to make a pentagon, then a hexagon. Follow the pattern above to discuss what students notice about the various shapes. Reveal Charts 3 and 4, labeling the pentagons and hexagons with the appropriate word cards. You may choose to add more pieces of spaghetti, giving students the opportunity to experiment with creating even larger polygons (e.g., heptagon, octagon).

T: Now, we’re going to play Complete that Shape. I am going to draw part of a shape on the board, like this (as shown on right). Then, I will say, “Complete that pentagon.” With your spaghetti, start with the part I have drawn and add more spaghetti sides, corners, and angles until you have built the entire shape. You can break the spaghetti into smaller pieces. Let’s play.

T: (Show an obtuse angle, as illustrated at right.) Complete that quadrilateral!
S: (Add two more pieces of spaghetti of varying lengths to create a quadrilateral.)
T: How many sides and angles do you have?
S: Four!
Concept Development  (33 minutes)

Materials:  (T) Tangram sheet (template), scissors, document camera (if available)  (S) Tangram sheet (template), scissors, personal white board

Note:  Students previously worked with tangrams in G1–M5–Lesson 5.  If time allows, refresh students’ memory by reading Grandfather Tang’s Story by Ann Tompert during story time.

Distribute materials.  (Students will also need the cut-out tangram pieces for G2–M8–Lesson 8.)

Part 1:  Cutting the Tangram and Analyzing the Polygons

T:  (Hold up tangram sheet.)  Who remembers what this is called?
S:  A tangram!
T:  Let’s describe the polygons as we cut them out.

T:  First, cut out the large square.  (Cut out large square from tangram sheet as students do the same.)

T:  (Hold up tangram backwards so students do not see the lines within.)  As you cut, talk to your partner:  What are the attributes, or characteristics, of a square?
S:  A square has four straight sides and four square corners.  It’s a special rectangle because its sides are all the same length.  It’s a quadrilateral.  It has parallel sides.
T:  Good descriptions!  Watch how I fold my large square down the diagonal line that goes through the middle.  (Fold paper.)  What polygon do you see in the top half?
S:  A triangle!
T:  As you cut out the triangle, tell your partner the attributes of a triangle.

S:  A triangle has three straight sides.  It has three angles, or corners.  This triangle has a square corner.
T:  (Hold up the triangle.)  How many triangles make up this whole triangle?
S:  Two!
T:  So we can make larger polygons, out of smaller ones.

T:  Cut apart the two smaller triangles, and set them aside.  (Model as students do the same.)

T:  Look at the other half.  (Hold up the other large triangle, pictured to the right.)  What polygons do you see inside this triangle?
S:  I see two smaller triangles and one bigger triangle.  I see two trapezoids.  There’s a square.  There’s a parallelogram.
T:  Which of the shapes are quadrilaterals?  Hold them up as you say their names.
S:  The square.  The parallelogram.  The trapezoids.
T:  Let’s cut off the triangle on top and place that with the other two.  (Model as students do the same.)
T:  Now we have the large trapezoid.  What are the attributes of this trapezoid?
Excerpt from Lesson 6, Continued

S: It has four straight sides, but they’re not all the same length. → This trapezoid has four corners, but they’re not square corners. → It has just one pair of parallel sides.

Next, cut off the parallelogram and trace, touch, and count its sides and angles. Cut out the remaining square and two triangles.

T: How many polygons make up the tangram?
S: Seven!

Part 2: Creating Composite Shapes

Allow time for students to explore ways to create new shapes. They do not have to be shapes that students can name. Remind students that they can flip, slide, and turn the pieces to make the new shapes.

Next, direct student pairs to create three shapes, a triangle, a square, and a parallelogram with no square corners (as pictured to the right), using the two largest triangles. After creating the shapes, students should draw them on their personal boards. Circulate to check for understanding, and encourage students to persevere, providing the least direction possible.

Have students gather their square and the two smallest triangles and move to the carpet.

T: Try this! Can you create a triangle out of a square and the two smallest triangles? (Allow students time to work.)

T: Now, combine the triangle you just made with your partner’s to make a square. (Allow students time to work.)

T: Is it possible for us to make a really big square with all of the squares you just made?
S: I think so. Let’s try! → I don’t think we have enough.

T: Let’s try. (Allow time for students to make the attempt. Ability to make a square will depend on the number of students in the class. If it is not possible to make a square, ask what shape could be made, and allow time to make a rectangle.)
Excerpt from Lesson 7: Lesson Objective: Interpret equal shares in composite shapes as halves, thirds, and fourths.

Concept Development (33 minutes)

Materials: (T) Tangram pieces (from G2–M8–Lesson 6), document camera, chart paper, pattern blocks
(S) Tangram pieces (from G2–M8–Lesson 6), pattern blocks in individual plastic bags (set of 1 hexagon, 4 squares, 3 triangles, 2 trapezoids, 3 wide, not thin, rhombuses)

Have students take out their tangram pieces. Distribute individual bags of pattern block pieces for later use.

Part 1: Using Tangrams to Create Composite Shapes Described as Halves

T: Let’s continue exploring ways to compose new shapes using our tangram pieces.
T: Start with just the two smallest triangles. What shapes can you make that you can name? (Allow students time to work.)

Circulate as students move the pieces to make new shapes. Choose three students to place their shapes under the document camera to show a larger triangle, a parallelogram with no square corners, and a parallelogram that is a square, respectively.

T: What is the name of this polygon?
S: Triangle!
T: How many parts are in this large triangle?
S: Two parts!
T: Are the parts equal?
S: Yes!
T: We can say this triangle is made up of two equal shares, or parts, called halves.
T: Let’s record this. (Draw the shape on chart paper, partitioned to show the pieces used.)

Repeat this process for the parallelogram and square, and record the shapes.

T: Let’s label this chart Halves, or 2 Equal Parts. (Label chart.)
T: If you didn’t make one of these shapes, move your pieces to make the shape now. If you did make all the shapes, try moving back and forth between them smoothly. (Wait for students to try all three shapes.)

T: Can we make halves by putting together a small triangle and a parallelogram? Why or why not? Discuss with your partner.

S: No, because the parts are different shapes and the size is not the same. → No, because there are two parts but they’re not equal.
T: That’s right. To be halves, the two parts must be equal, which means the same size.
T: (Point to each shape.) How many halves make a whole? Give me a complete sentence.
S: Two halves make a whole.
Part 2: Using Pattern Blocks to Create Composite Shapes Described as Halves, Thirds, and Fourths

T: Let’s explore halves using pattern blocks. Start with a hexagon. (Place a hexagon under the document camera as students get a hexagon from among their shapes.)

T: What smaller polygon could you use to cover half of the hexagon? (Allow students time to experiment and find the trapezoid.)

S: A trapezoid!

T: Yes. One trapezoid covers half the hexagon. Put another trapezoid on top to cover the whole hexagon. (Place two trapezoids on top of the hexagon under the document camera as students do the same.)

T: How many trapezoids make a whole hexagon?

S: Two!

T: Are they equal shares?

S: Yes!

T: How many halves are in the hexagon?

S: Two halves!

T: Let’s record this on our Halves chart. (Record on chart.)

Repeat this process for a rhombus, covering it with two equilateral triangles, and record on the chart.

T: Let’s try something different. This time we’ll use a trapezoid. (Place a trapezoid under the document camera, as students get a trapezoid from among their shapes.)

T: Can you cover the trapezoid with three smaller polygons? (Allow students time to experiment.)

T: What shape did you use?

S: A triangle!

T: Are the shapes equal in size?

S: Yes!

T: How many equal shares compose a whole trapezoid?

S: Three!

T: We call three equal parts thirds. Let’s make a new chart and record this. (Label a new chart Thirds, or 3 Equal Shares, and draw the shape on chart paper, partitioned to show the pieces used.)

T: Work with a partner. Leave one triangle on and cover the rest of the trapezoid with a rhombus. (Model under the document camera as students do the same.)

T: Talk with your partner: Are these halves? Why or why not?

S: They’re not halves because there are two parts but they’re different shapes and sizes. → The two parts aren’t equal because one is a triangle and the other is a rhombus.

T: Correct. Is it thirds?

S: No, because there are only two parts, not three.

T: Yes!

Repeat the process for a hexagon covered by three rhombuses, and record on the chart.
T: Now, can you make one large square that is created with equal parts? (Allow students time to work with the smaller squares.) Invite a student to show their composite square under the document camera. Have students note how many parts are used to make the square, and if they are even. Introduce them to the term **fourths**, create a new chart labeled *Fourths, or 4 Equal Parts*, and draw the shape, partitioned to show the pieces used.
Excerpt from Lesson 8: Lesson Objective: Interpret equal shares in composite shapes as halves, thirds, and fourths.

Concept Development (30 minutes)

Materials: (T) Pattern blocks, Problem Set, document camera (S) Problem Set, pattern blocks in individual plastic bags per pair (set of 1 hexagon, 6 squares, 6 triangles, 2 trapezoids, 3 wide, not thin, rhombuses)

Note: The Problem Set is completed throughout the Concept Development.

Note: In this lesson, students work in pairs to encourage math conversations as they explore equal shares using pattern blocks. Students identify and use one pattern block to cover a half, a third, or a fourth of a given shape. They then draw a picture of the composite shape formed by the halves, thirds, and fourths, and shade the smaller polygon within the composite shape.

For each problem, questions are supplied to support the objective. Post the questions so students can discuss their work in greater detail with a partner or at their tables. Encourage them to close their eyes and visualize how they moved the smaller polygons to create the new shape. Have them describe how they used flips, slides, or turns to move the pieces. This discussion, linked with action, develops spatial visualization skills.

Pass out the Problem Set and the individual bags of pattern blocks.

Problem 1: Use one pattern block to cover half the rhombus.

T: Complete Problem 1. Share your thinking with your partner. Close your eyes and visualize how you moved the smaller polygons to create the rhombus. Describe how you flip, slide, or turn the pieces.

Ask questions such as the following to support deeper analysis of halves:

- How can looking at angles and sides help you find the block that is half a rhombus?
- If the rhombus was made from a piece of paper, how many different ways could you cut it to get two halves? Draw the different ways you could cut the rhombus into two halves.

Problem 2: Use one pattern block to cover half the hexagon.

Ask questions such as the following to encourage interpreting different representations of a half:

- Cover the bottom half of the hexagon with three triangles. Is it still half covered? Why or why not?
- Cover the bottom half of the hexagon with a rhombus and a triangle. Is it still half covered?

Problem 3: Use one pattern block to cover one-third of the hexagon.

Ask questions such as the following to encourage deeper understanding of thirds:

- How many thirds do you need to fill the whole hexagon?
Excerpt from Lesson 8, Continued

- Cover one third with two triangles. Is the hexagon one third covered?
- What fraction is not covered?

**Problem 4: Use one pattern block to cover one-third of the trapezoid.**

Prompt students to interpret thirds in relationship to a whole:
- Use your drawing of the trapezoid formed by thirds to talk about how many small triangles would make a whole hexagon.
- How many thirds are in the trapezoid? In the hexagon?

**Problem 5: Use four pattern blocks to make one larger square.**

Prompt students to support different understandings of fourths:
- How many equal shares does the large square have?
- How many fourths make up the large square?
- How many fourths equal one whole square?
- Use your blocks to show that 2 fourths is the same as a half of the large square.

**Problem 6: Use one pattern block to cover one-sixth of the hexagon.**

Ask questions such as the following to support thinking about sixths:
- How many equal parts does the hexagon have?
- How many *sixths* make up the hexagon?
Excerpt from Lesson 10: Lesson Objective: Partition circles and rectangles into equal parts, and describe those parts as halves, thirds, or fourths.

Concept Development (30 minutes)

Materials: (T) 1 piece of 8½" × 11" paper, cut and colored circle from G2–M8–Lesson 9 (S) Rectangles and circle template, personal white board, 1 piece of 8½" × 11" paper, crayons or colored pencils, cut and colored circle from G2–M8–Lesson 9

Part 1: Making Thirds

Pass out rectangles and circle template, and have students insert it into their personal boards.

T: Yesterday, we worked with halves. Today, let’s take a look at thirds.

T: When something is divided in thirds, how many equal shares does it have?

S: Three!

T: Correct! Draw two lines in each rectangle to show two different ways to partition them into thirds. (Demonstrate, and then allow students time to work.)

T: Shade in one third of each rectangle. What do you notice?

S: The thirds look different. → Even though they are both thirds, one is long and skinny, and one is short and fat. → Even though they’re different shapes, they’re both one third of the whole shape. → They both have two parts unshaded.

T: Practice partitioning the rectangles into thirds. (Allow students time to work.)

T: Choose your rectangle that best shows thirds. Let’s color each third and count as we go. Point to one third, and count with me. This is one third.

S: (Point and count.) One third. (Continue, coloring to show 2 thirds and then 3 thirds, counting after each.)

T: Erase your boards. Now, use two vertical lines to partition one rectangle into thirds. Then draw one vertical line to cut another rectangle into halves.

T: Color one third of the top rectangle and one half of the bottom rectangle. (Pause as students work.)

T: Which part is larger?

S: One half is larger.

T: Look at both rectangles as a whole. Which has more parts? Halves or thirds?

S: Thirds.
Excerpt from Lesson 10, Continued

T: So, thirds have more parts, but the parts are smaller. Think about that for a moment. Why do you think that is?
S: The more times you cut the rectangle, the smaller the pieces. → Yeah, and if you just cut it once, the pieces will be bigger.
T: Let’s try that with circles. (Draw two circles of equal size on the board. Divide one in half and one into thirds. Invite students to do the same with the circles on their template.)
T: Which is more, one half or one third? Why?
S: It’s the same as with the rectangle. → One half is greater because there are only two parts. → One third is smaller because you cut the circle into more pieces.

Have students erase their boards and practice drawing thirds in the circles. Repeat the process above, inviting students to choose the circle that shows the best thirds and to count each third.

Part 2: Making Fourths

Have students take out their circle from yesterday’s lesson.

T: We already folded, colored, and labeled one half. Let’s turn the circle over and make fourths, or quarters, on the other side. When something is divided into fourths, how many equal shares does it have?
S: Four!
T: Fold your circle to partition it into four equal parts. Make sure each part is equal in size. Fold so the ends of the first line come together at the edge. (Model as students do the same.)
T: Color and label one fourth of your circle. (Model as students do the same.)
T: Point and count the fourths with your partner.
S: 1 fourth, 2 fourths, 3 fourths, 4 fourths.
T: Now, use your personal boards to partition your circles into fourths. (Allow students time to work.) Tell your partner how you divided the circle into equal shares.
S: I made it look like my paper circle. → I drew a cross in the middle of the circle. → You can draw an X in the circle.
T: Shade in 2 fourths of the circle. (Allow students time to work.)
T: Now, let’s partition our rectangles into fourths, or quarters. There are a few different ways we can do this. (Demonstrate and then allow students time to work.)

Have students continue to practice partitioning rectangles into fourths and then shading the following possible patterns: 3 fourths, 4 fourths, 1 quarter, and 2 quarters.
Excerpt from Lesson 10, Continued

Part 3: Partitioning to Make Thirds and Fourths of a Sheet Cake and Pizza

T: We’re going to use your personal boards and the template to show equal shares. Let’s pretend that the rectangles are sheet cakes and the circle is a pizza.

T: It’s easy to think about food when we talk about equal shares because there are so many foods we cut up to share with friends and family, like cakes, pizza, quesadillas, and candy bars!

T: You’re going to draw lines to cut the pizza and sheet cakes into halves, thirds, and fourths. Please show two different ways of partitioning when slicing the two sheet cakes. Then you’ll color your share.

T: For example, if I say, “You get 3 fourths of the cake,” show me two different ways to partition the rectangles, and color 3 fourths on each cake.

Ask students to show a variety of partitions, for example, naming 1, 2, and 3 thirds and 1, 2, 3, and 4 fourths, as students partition and color their share.

T: Now, listen to my story, and show me how each shape should be divided. Mary, Colleen, and Saffron share a pizza equally. Show how to slice the pizza, and label each share with their name. (Allow students time to work.)

T: Talk with your partner: What fraction of the pizza did the girls share in all?

S: They shared the whole pizza. → That’s 3 thirds!

T: Correct! What if Mary also eats Colleen’s share of the pizza? How much has she eaten?

S: Mary has eaten two thirds of the pizza. → She has eaten double her share. → She has eaten two shares now.

NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

Support English language learners during partner shares by giving them sentence frames to assist them. For instance: “The three of them shared ____,” or “They each got a _____ of the pizza.”
Excerpt from Lesson 14: Lesson Objective: Tell time to the nearest five minutes.

Concept Development (30 minutes)

Materials:  (T) Large instructional geared clock, clock from G2–M8–Lesson 13, student clock (optional)
            (S) Clocks from G2–M8–Lesson 13, student clocks (optional), personal white boards

Distribute the clocks from G2–M8–Lesson 13.

T: How many minutes is each number on the clock worth?
S: 5 minutes!
T: How many fives does it take to get all the way around the clock? (Count together.)
S: 1 five, 2 fives, 3 fives, ...12 fives!
T: Let’s count minutes around the clock by fives.
T: (Count with students by fives around the clock face, starting with the 1.)
T: When we get to the 12, it’s 60 minutes later. One hour equals 60 minutes, so we can say it’s a new hour!
T: Now, let’s show some times with our clocks.

Show 4:05 on the geared instructional clock.

T: Set your clocks to look like mine.
T: How many minutes have passed since four o’clock?
S: 5 minutes.
T: Yes. We say this time like this, four oh five, and we write it like this. (Write 4:05.)

Continue moving the minute hand around the clock, asking students to read the time at each five-minute interval. At each stop, draw students’ attention to the position of the hour hand relative to the minute hand.

T: (Stop when students reach 4:55.) Notice how very close the hour hand is to the 5. But is it five o’clock yet?
S: No!
T: Turn and talk. What time is it now?
S: It’s five minutes before five. → It’s 4:55.
T: Yes! The hour hand takes a full hour to move from one number to the next, so it moves a little bit every minute. It has made almost the whole journey around the clock when the minute hand is on the 11.
T: How many more minutes are needed to complete the hour?
S: 5 minutes!
T: What time is it now?
S: Five o’clock!

Repeat with more examples of hour-hand settings if students are unclear on the concept.

NOTES ON MULTIPLE MEANS OF ENGAGEMENT:
Provide students with disabilities and students who are below grade level with extra practice using an online animated clock such as that found at http://www.mathsisfun.com/time-clocks-analog-digital.html. English language learners would also benefit from using such a clock that not only gives the digital time along with the analog clock, but writes the time out as well.
Excerpt from Lesson 14, Continued

T: Now, let’s read some times!
Show 7:35 on the geared instructional clock.

T: What time is this? Talk with a partner. You may use your student clock to figure it out.

S: The hour hand is after the 7, and the minute hand is on the 7. 5, 10, 15, 20, 25, 30, 35. It’s 7:35. → The hour hand is past the 7, so 30, 35... 7:35.

T: Excellent! I noticed some people are using what they learned about fractions and the minutes to start at half past, or 30, and counting by 5 from there. Very clever!

Continue to state times in number and word form (e.g., 8:10, a quarter to two) with the following sequence: 9:35, 1:10, a quarter after three, 2:50, etc., giving students ample practice reading time and setting time on their clocks. Have them record the times, as well, on their personal boards. Let students suggest times to read, until they demonstrate proficiency. Then instruct them to work on the Problem Set and Application Problem.
Excerpt from Lesson 16: Lesson Objective: Solve elapsed time problems involving whole hours and a half hour.

Concept Development (33 minutes)

Materials: (T) Demonstration clock (can be clock from G2–M8–Lessons 13–14) (S) Student clocks, personal white boards, 1 piece of chart paper and a few markers (per group)

Draw analog clocks representing 7:00 and 7:30 on the board, or show two demonstration clocks set to those times. Then, display the time on the board or on clocks for each of the following problems.

Problem 1
Kalpana gets up at 7:00 a.m. She leaves the house at 7:30 a.m. How long does it take her to get ready?

T: Read the problem.
S: (Read the problem chorally.)
T: (Pause.) How long does it take Kalpana to get ready?
S: 30 minutes. → Half an hour.
T: How did you figure this problem out? Turn and talk.
S: I used my clock and saw the fraction, half an hour. → 7:30 is 30 minutes after 7:00. You just look at the minutes and subtract. 30 minus 0 is easy, 30. → I skip-counted by fives until I got to 7:30.
T: Great! Let’s try another problem.

Problem 2
Tony goes bowling on Saturday at 2:00 p.m. He gets home at 9:00 p.m. How long did he stay out?

Have students read the problem chorally.

T: Work with a partner to try to solve this problem. (Allow students time to work.)
T: How long did Tony stay out?
S: 7 hours!
T: How did you figure that out?
S: I counted on the clock: 3, 4, 5, 6, 7, 8, 9, so 7 hours. → I subtracted 2 from 9 to get 7 hours. → I knew that halfway around the clock was 8 p.m., and that is 6 hours. And, I only needed 1 more hour, so 7 hours.
Problem 3
The students arrive at the museum at 10:00 a.m. They leave at 2:00 p.m. How long are the students at the museum?

T: Read the problem, and then solve it with a partner. (Allow students time to work.)

T: How long are the students at the museum?

S: 4 hours!

T: How do you know?

S: I counted 11, 12, 1, 2, so 4 hours. → I know that it’s 2 hours from 10 to 12, and then another 2 hours from 12 to 2. Since 2 + 2 = 4, it was 4 hours. → I went back in time. It’s 2 hours from 2 to noon, and then 2 hours from noon to 10.

T: Let’s try another problem that goes from a.m. to p.m.

Problem 4
A movie starts at 11:30 a.m. It finishes at 1:30 p.m. How long does the movie last?

T: Work with a partner to try to solve this problem. (Allow students time to work.)

T: How long does the movie last?

S: 2 hours.

T: How did you figure it out?

S: I couldn’t just subtract, because it’s not 10 hours long. It goes from a.m. to p.m. → I used my clock. One hour, 2 hours…. It’s 2 hours! → It turns into p.m. at 12. So, from 11:30 a.m. to 12:30 p.m. is an hour, and then it’s another hour to 1:30 p.m. 2 hours!

T: Some students noticed that we are going from a.m. to p.m., so we can’t just subtract. We have to count the hours forward. Remember, you can use your clocks to help if you like.

Problem 5
Beth goes to bed at 8:00 p.m. She wakes up at 3:30 a.m. to go to the airport. How much time did she sleep?

T: Work with a partner to figure this out. (Allow students time to work.)

T: How long, or how much time, did Beth sleep?

S: Seven and a half hours. → Seven hours and 30 minutes.

T: For this problem, could we use the arrow way with hours and minutes to make solving easier? Turn and talk.

S: Yes. First, I figured out how long it is until midnight, or 12:00 a.m., which is 4 hours. Then, it’s another 3 and a half till 3:30. So, 7 and a half hours. → I know that halfway around the clock is 6 hours. Then, I just added another hour and a half to get to 3:30. All together that’s 7 and a half hours.
Problem 6

Draw or show two clocks, one showing 8:00 a.m. and one showing 8:00 p.m.

T: Are these clocks showing the same time or two different times?
S: Different! They’re the same except one clock shows a.m. and one clock shows p.m.

T: Turn and talk. If these times occur on the same day, how much time has passed between the first time and the second?
S: (Count hours.) 12 hours. I know it’s 12 hours in half a day, so 12 hours. The difference between the same time of day in a.m. or p.m. is 12 hours.

Continue with the following problems: 4:30 p.m. and 1:30 p.m., 7:00 a.m. and 2:30 a.m.

Challenge Question

Organize desks into groups of three or four, as students will complete this last activity in cooperative groups. Distribute a piece of chart paper and a few markers to each group.

T: Can you believe it, this is our last math lesson of the year! I have one final question for you: In how many days will you be third-graders?

T: As a team, use what you know about months, weeks, and days to solve this problem.

T: Let’s review. How many days in a week?
S: 7 days.

T: About how many weeks in a month?
S: 4 weeks.

T: And about how many days in a month?
S: It depends on the month, usually 31. Sometimes 30 and sometimes 31, except for February.

T: Yes! Our last day of school is [month, day, year]. And our first day next year is [month, day, year].

T: On your chart paper, use pictures, words, and/or numbers to solve the problem. Get to work!

If time permits, have students present their solutions and explain their thinking. Otherwise, hang charts around the room, and have a quick gallery walk before distributing the last Problem Set.