A Story of Units®

Eureka Math™

Grade 3, Module 7

Student File_A

Contains copy-ready classwork and homework as well as templates (including cut outs)

Name _____   Date _____

Lena's family visits Little Tree Apple Orchard. Use the RDW process to solve the problems about Lena's visit to the orchard. Use a letter to represent the unknown in each problem.

1. The sign below shows information about hayrides at the orchard.

Hayrides

Adult ticket $7

Child ticket $4

Leaves every 15 minutes starting at 11:00.

a. Lena's family buys 2 adult tickets and 2 child tickets for the hayride. How much does it cost Lena's family to go on the hayride?

b. Lena's mom pays for the tickets with $5 bills. She receives $3 in change. How many $5 bills does Lena's mom use to pay for the hayride?

c. Lena's family wants to go on the fourth hayride of the day. It's 11:38 now. How many minutes do they have to wait for the fourth hayride?

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Lesson 1:   Solve word problems in varied contexts using a letter to represent the unknown.

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2. Lena picked 17 apples, and her brother picked 19. Lena's mom has a pie recipe that requires 9 apples. How many pies can Mom make with the apples that Lena and her brother picked?

3. Lena's dad gives the cashier $30 to pay for 6 liters of apple cider. The cashier gives him $6 in change. How much does each liter of apple cider cost?

4. The apple orchard has 152 apple trees. There are 88 trees with red apples. The rest of the trees have green apples. How many more trees have red apples than green apples?

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Lesson 1:   Solve word problems in varied contexts using a letter to represent the unknown.

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Name _____   Date _____

Max's family takes the train to visit the city zoo. Use the RDW process to solve the problems about Max's trip to the zoo. Use a letter to represent the unknown in each problem.

1. The sign below shows information about the train schedule into the city.

> **Train Fare–One Way**
>
> **Adult…………………….…..$8**
>
> **Child…………………………..$6**
>
> **Leaves every 15 minutes starting at 6:00 a.m.**

a. Max's family buys 2 adult tickets and 3 child tickets. How much does it cost Max's family to take the train into the city?

b. Max's father pays for the tickets with $10 bills. He receives $6 in change. How many $10 bills does Max's father use to pay for the train tickets?

c. Max's family wants to take the fourth train of the day. It's 6:38 a.m. now. How many minutes do they have to wait for the fourth train?

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Lesson 1:   Solve word problems in varied contexts using a letter to represent the unknown.

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2. At the city zoo, they see 17 young bats and 19 adult bats. The bats are placed equally into 4 areas. How many bats are in each area?

3. Max's father gives the cashier $20 to pay for 6 water bottles. The cashier gives him $8 in change. How much does each water bottle cost?

4. The zoo has 112 types of reptiles and amphibians in their exhibits. There are 72 types of reptiles, and the rest are amphibians. How many more types of reptiles are there than amphibians in the exhibits?

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Lesson 1: Solve word problems in varied contexts using a letter to represent the unknown.

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Name _____   Date _____

Use the RDW process to solve. Use a letter to represent the unknown in each problem.

1. Leanne needs 120 tiles for an art project. She has 56 tiles. If tiles are sold in boxes of 8, how many more boxes of tiles does Leanne need to buy?

2. Gwen pours 236 milliliters of water into Ravi's beaker. Henry pours 189 milliliters of water into Ravi's beaker. Ravi's beaker now contains 800 milliliters of water. How much water was in Ravi's beaker to begin with?

3. Maude hung 3 pictures on her wall. Each picture measures 8 inches by 10 inches. What is the total area of the wall covered by the pictures?

Lesson 2:   Solve word problems in varied contexts using a letter to represent the unknown.

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4. Kami scored a total of 21 points during her basketball game. She made 6 two-point shots, and the rest were three-point shots. How many three-point shots did Kami make?

5. An orange weighs 198 grams. A kiwi weighs 85 grams less than the orange. What is the total weight of the fruit?

6. The total amount of rain that fell in New York City in two years was 282 centimeters. In the first year, 185 centimeters of rain fell. How many more centimeters of rain fell in the first year than in the second year?

Name _____ Date _____

Use the RDW process to solve. Use a letter to represent the unknown in each problem.

1. A box containing 3 small bags of flour weighs 950 grams. Each bag of flour weighs 300 grams. How much does the empty box weigh?

2. Mr. Cullen needs 91 carpet squares. He has 49 carpet squares. If the squares are sold in boxes of 6, how many more boxes of carpet squares does Mr. Cullen need to buy?

3. Erica makes a banner using 4 sheets of paper. Each paper measures 9 inches by 10 inches. What is the total area of Erica's banner?

Lesson 2:   Solve word problems in varied contexts using a letter to represent the unknown.

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4. Monica scored 32 points for her team at the Science Bowl. She got 5 four-point questions correct, and the rest of her points came from answering three-point questions. How many three-point questions did she get correct?

5. Kim's black kitten weighs 175 grams. Her gray kitten weighs 43 grams less than the black kitten. What is the total weight of the two kittens?

6. Cassias and Javier's combined height is 267 centimeters. Cassias is 128 centimeters tall. How much taller is Javier than Cassias?

Lesson 2: Solve word problems in varied contexts using a letter to represent the unknown.

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Name _____ Date _____

Use the RDW process to solve the problems below. Use a letter to represent the unknown in each problem. When you are finished, share your solutions with a partner. Discuss and compare your strategies with your partner's strategies.

1. Monica measures 91 milliliters of water into 9 tiny beakers. She measures an equal amount of water into the first 8 beakers. She pours the remaining water into the ninth beaker. It measures 19 milliliters. How many milliliters of water are in each of the first 8 beakers?

2. Matthew and his dad put up 8 six-foot lengths of fence on Monday and 9 six-foot lengths on Tuesday. What is the total length of the fence?

3. The total weight of Laura's new pencils is 112 grams. One pencil rolls off the scale. Now the scale reads 105 grams. What is the total weight of 7 new pencils?

4. Mrs. Ford's math class starts at 8:15. They do 3 fluency activities that each last 4 minutes. Just when they finish all of the fluency activities, the fire alarm goes off. When they return to the room after the drill, it is 8:46. How many minutes did the fire drill last?

5. On Saturday, the baker bought a total of 150 pounds of flour in five-pound bags. By Tuesday, he had 115 pounds of flour left. How many five-pound bags of flour did the baker use?

6. Fred cut an 84-centimeter rope into 2 parts and gave his sister 1 part. Fred's part is 56 centimeters long. His sister cut her rope into 4 equal pieces. How long is 1 of his sister's pieces of rope?

Name _____   Date _____

Use the RDW process to solve the problems below. Use a letter to represent the unknown in each problem.

1. Jerry pours 86 milliliters of water into 8 tiny beakers. He measures an equal amount of water into the first 7 beakers. He pours the remaining water into the eighth beaker. It measures 16 milliliters. How many milliliters of water are in each of the first 7 beakers?

2. Mr. Chavez's third graders go to gym class at 11:15. Students rotate through three activities for 8 minutes each. Lunch begins at 12:00. How many minutes are there between the end of gym activities and the beginning of lunch?

3. A box contains 100 pens. In each box there are 38 black pens and 42 blue pens. The rest are green pens. Mr. Cane buys 6 boxes of pens. How many green pens does he have in total?

4. Greg has $56. Tom has $17 more than Greg. Jason has $8 less than Tom.

    a. How much money does Jason have?

    b. How much money do the 3 boys have in total?

5. Laura cuts 64 inches of ribbon into two parts and gives her mom one part. Laura's part is 28 inches long. Her mom cuts her ribbon into 6 equal pieces. How long is one of her mom's pieces of ribbon?

Student A

Total pencils

| 9 | 9 | 9 | 9 | 9 | 9 |

$6 \times 9 = 54$

Pencils she gave away

24×2

$(6 \times 4) \times 2$

$6 \times (4 \times 2)$
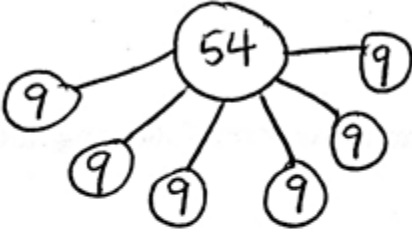
$6 \times 8 = 48$

$$\begin{array}{r} {}^{4}\;{}^{14} \\ \cancel{5}\cancel{4} \\ -\;48 \\ \hline 6 \end{array}$$

Mrs. Mashburn has 6 pencils left.

Student B

Total pencils

54 → 9, 9, 9, 9, 9, 9

$6 \times 9 = 54$

Pencils she gave away

$g = 24 \times 2$

$g = 48$

$$\begin{array}{r} 24 \\ +\;24 \\ \hline 48 \end{array}$$

$$\begin{array}{r} {}^{4}\;{}^{14} \\ \cancel{5}\cancel{4} \\ -\;48 \\ \hline 6 \end{array}$$

Mrs. Mashburn has 6 pencils left.

student work samples

Student C

Mrs. Mashburn has
6 pencils left.

student work samples

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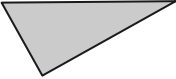
Name _____ Date _____

1. Cut out all the polygons (A–L) in the Template. Then, use the polygons to complete the following chart.

Attribute	Write the letters of the polygons in this group.	Sketch 1 polygon from the group.
Example: **3 Sides**	Polygons: Y, Z	
4 Sides	Polygons:	
At Least 1 Set of Parallel Sides	Polygons:	
2 Sets of Parallel Sides	Polygons:	
4 Right Angles	Polygons:	
4 Right Angles and 4 Equal Sides	Polygons:	

2. Write the letters of the polygons that are quadrilaterals. Explain how you know these polygons are quadrilaterals.

3. Sketch a polygon below from the group that has 2 sets of parallel sides. Trace 1 pair of parallel sides red. Trace the other pair of parallel sides blue. What makes parallel sides different from sides that are not parallel?

4. Draw a diagonal line from one corner to the opposite corner of each polygon you drew in the chart using a straightedge. What new polygon(s) did you make by drawing the diagonal lines?

Name _____   Date _____

1. Complete the chart by answering true or false.

Attribute	Polygon	True or False
Example: **3 Sides**		True
4 Sides		
2 Sets of Parallel Sides		
4 Right Angles		
Quadrilateral		

2. a. Each quadrilateral below has at least 1 set of parallel sides. Trace each set of parallel sides with a colored pencil.
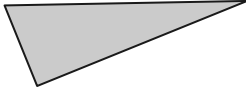
b. Using a straightedge, sketch a different quadrilateral with at least 1 set of parallel sides.

Name _____   Date _____

1. Cut out all the polygons (M–X) in the Template. Then, use the polygons to complete the following chart.
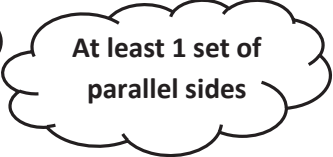
Attribute	List polygons' letters for each group.	Sketch 1 polygon from the group.
Example: **3 Sides**	Polygons: Y, Z	
All Sides Are Equal	Polygons:	
All Sides Are Not Equal	Polygons:	
At Least 1 Right Angle	Polygons:	
At Least 1 Set of Parallel Sides	Polygons:	

2. Compare Polygon M and Polygon X. What is the same? What is different?

3. Jenny says, "Polygon N, Polygon R, and Polygon S are all regular quadrilaterals!" Is she correct? Why or why not?

4. "I have six equal sides and six equal angles. I have three sets of parallel lines. I have no right angles."

    a. Write the letter and the name of the polygon described above.

    b. Estimate to draw the same type of polygon as in part (a), but with no equal sides.

Name _____ Date _____

1. Match the polygons with their appropriate clouds. A polygon can match to more than 1 cloud.

All sides are equal.

All sides are not equal.

At least 1 right angle

At least 1 set of parallel sides

hexagon

square

rectangle

pentagon

regular octagon

decagon

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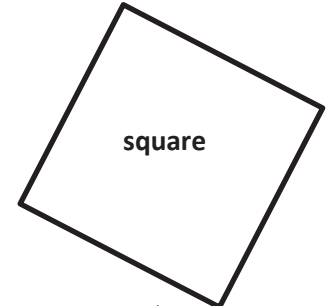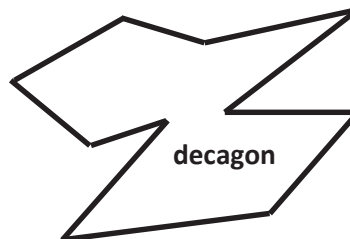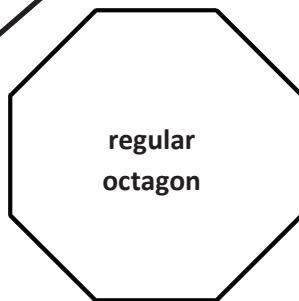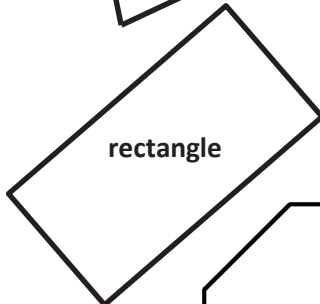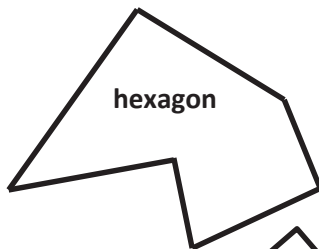
2. The two polygons below are regular polygons. How are these polygons the same? How are they different?
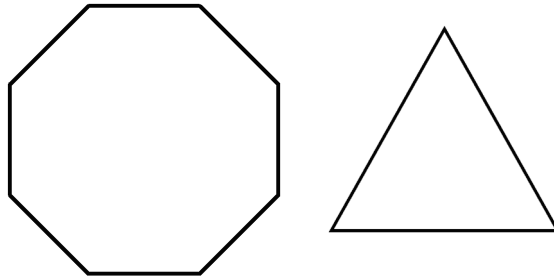
3. Lucia drew the polygons below. Are any of the polygons she drew regular polygons? Explain how you know.

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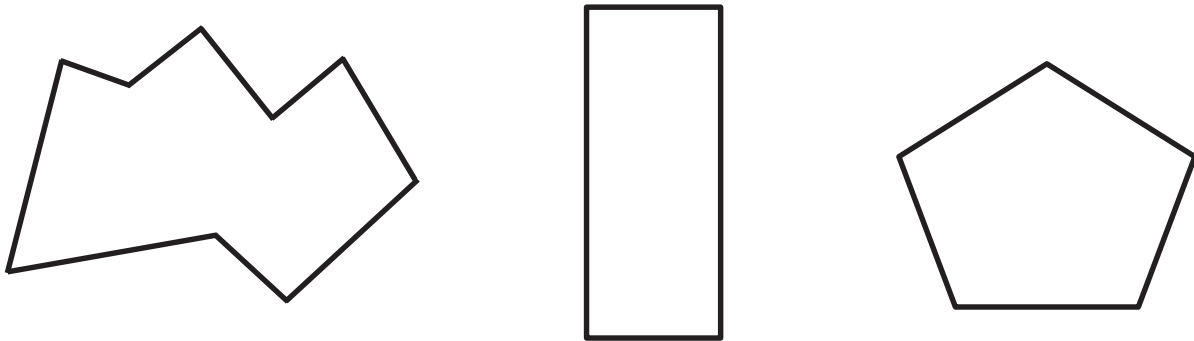
Name _____ Date _____

Use a ruler and a right angle tool to help you draw the figures with the attributes given below.

1. Draw a triangle with 1 right angle.

2. Draw a quadrilateral with 4 right angles and sides that are all 2 inches long.

3. Draw a quadrilateral with at least 1 set of parallel sides. Trace the parallel sides green.

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Lesson 6: Draw polygons with specified attributes to solve problems.

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4. Draw a pentagon with at least 2 equal sides. Label the 2 equal side lengths of your shape.

5. Draw a hexagon with at least 2 equal sides. Label the 2 equal side lengths of your shape.

6. Sam says that he drew a polygon with 2 sides and 2 angles. Can Sam be correct? Use pictures to help you explain your answer.

Name _____   Date _____

Use a ruler and a right angle tool to help you draw the figures with the given attributes below.

1. Draw a triangle that has no right angles.

2. Draw a quadrilateral that has at least 2 right angles.

3. Draw a quadrilateral with 2 equal sides. Label the 2 equal side lengths of your shape.

4. Draw a hexagon with at least 2 equal sides. Label the 2 equal side lengths of your shape.

5. Draw a pentagon with at least 2 equal sides. Label the 2 equal side lengths of your shape.

6. Cristina describes her shape. She says it has 3 equal sides that are each 4 centimeters in length. It has no right angles. Do your best to draw Cristina's shape, and label the side lengths.

Lesson 6: Draw polygons with specified attributes to solve problems.

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Name _____   Date _____

1. Use tetrominoes to create at least two different rectangles. Then, color the grid below to show how you created your rectangles. You may use the same tetromino more than once.
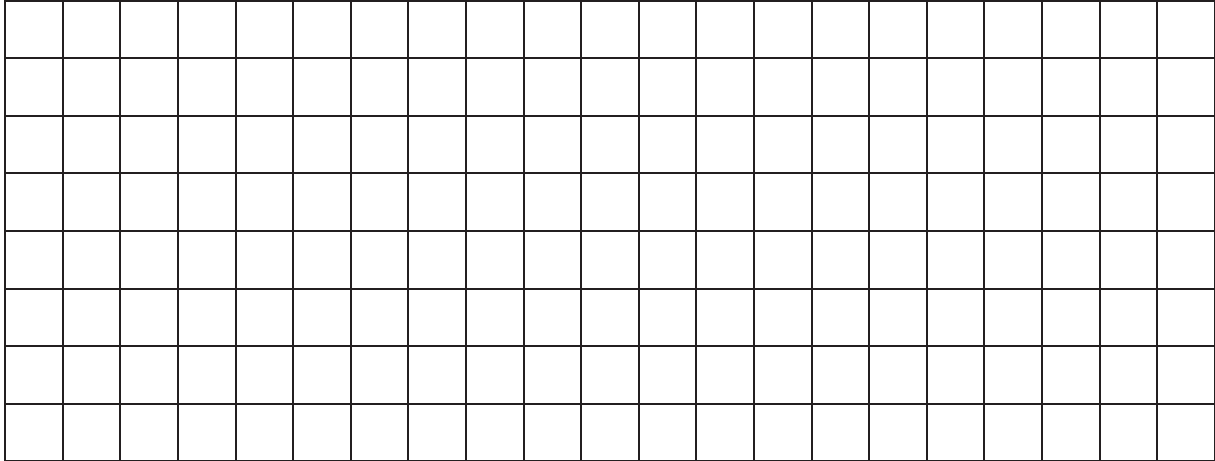
2. Use tetrominoes to create at least two squares, each with an area of 36 square units. Then, color the grid below to show how you created your squares. You may use the same tetromino more than once.
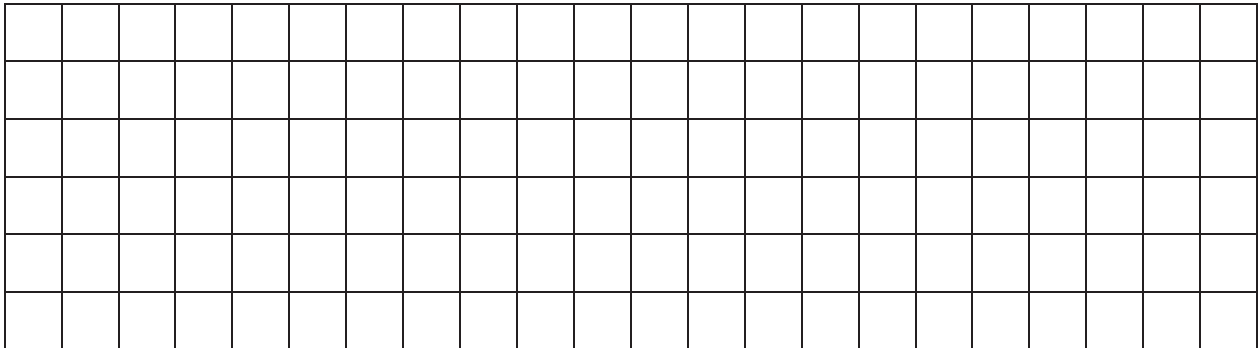
    a. Write an equation to show the area of a square above as the sum of the areas of the tetrominoes you used to make the square.

    b. Write an equation to show the area of a square above as the product of its side lengths.

Lesson 7:   Reason about composing and decomposing polygons using tetrominoes.

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3. a. Use tetrominoes to create at least two different rectangles, each with an area of 12 square units. Then, color the grid below to show how you created the rectangles. You may use the same tetromino more than once.
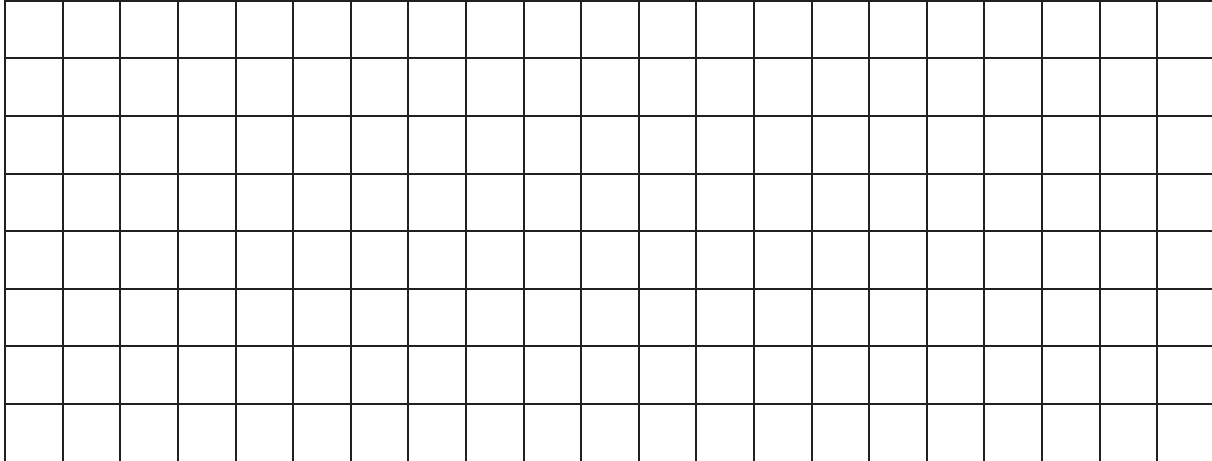
   b. Explain how you know the area of each rectangle is 12 square units.

4. Marco created a rectangle with tetrominoes and traced its outline in the space below. Use tetrominoes to re-create it. Estimate to draw lines inside the rectangle below to show how you re-created Marco's rectangle.

Name _____   Date _____

1. Color tetrominoes on the grid to create three different rectangles. You may use the same tetromino more than once.

Tetrominoes

Lesson 7: Reason about composing and decomposing polygons using tetrominoes.

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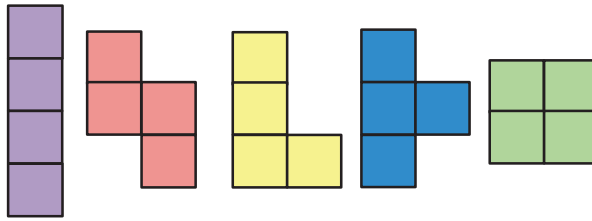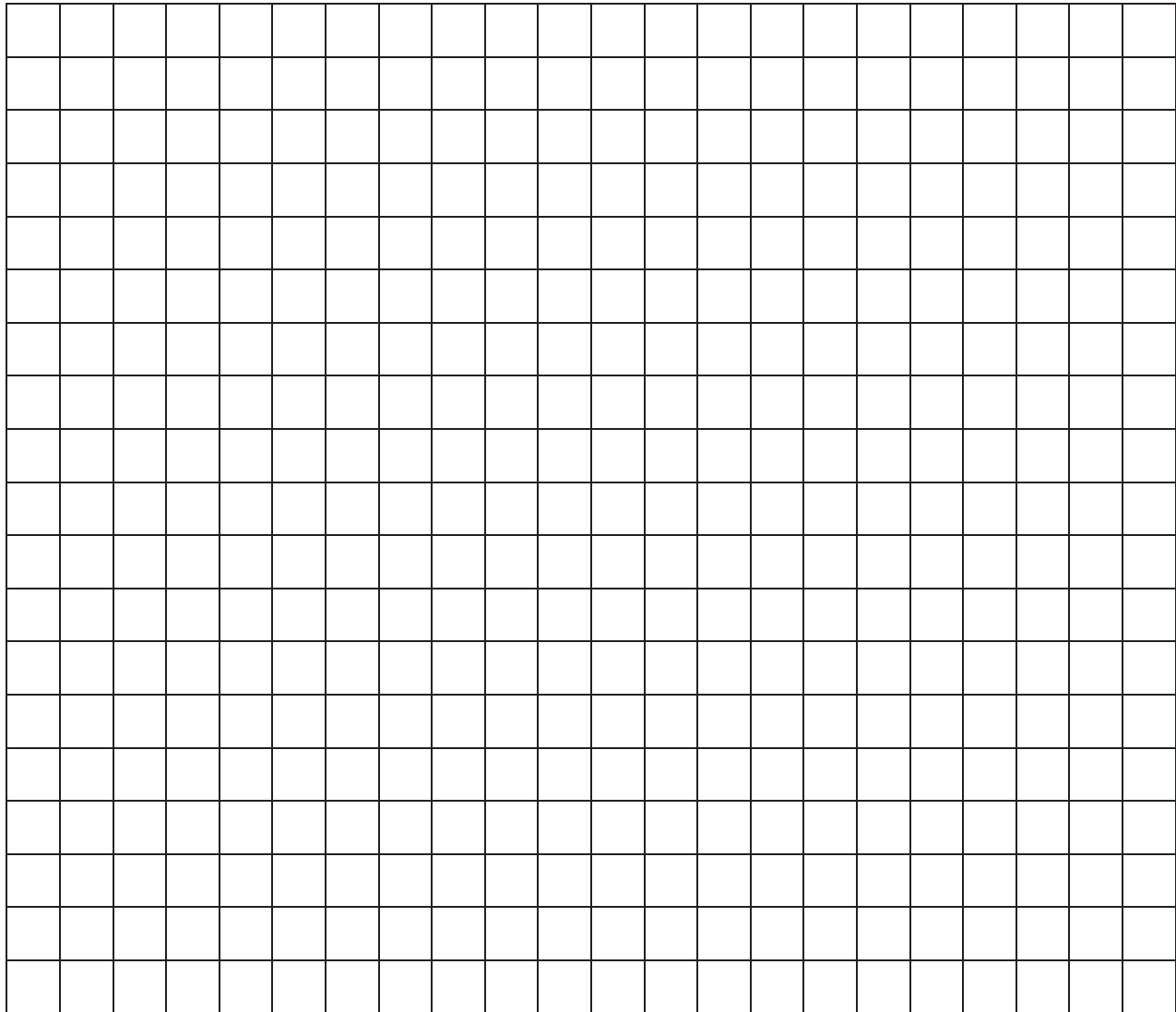
2. Color tetrominoes on the grid below to:

   a. Create a square with an area of 16 square units.

   b. Create at least two different rectangles, each with an area of 24 square units.

   You may use the same tetromino more than once.
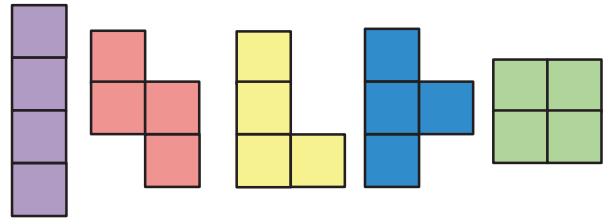
Tetrominoes
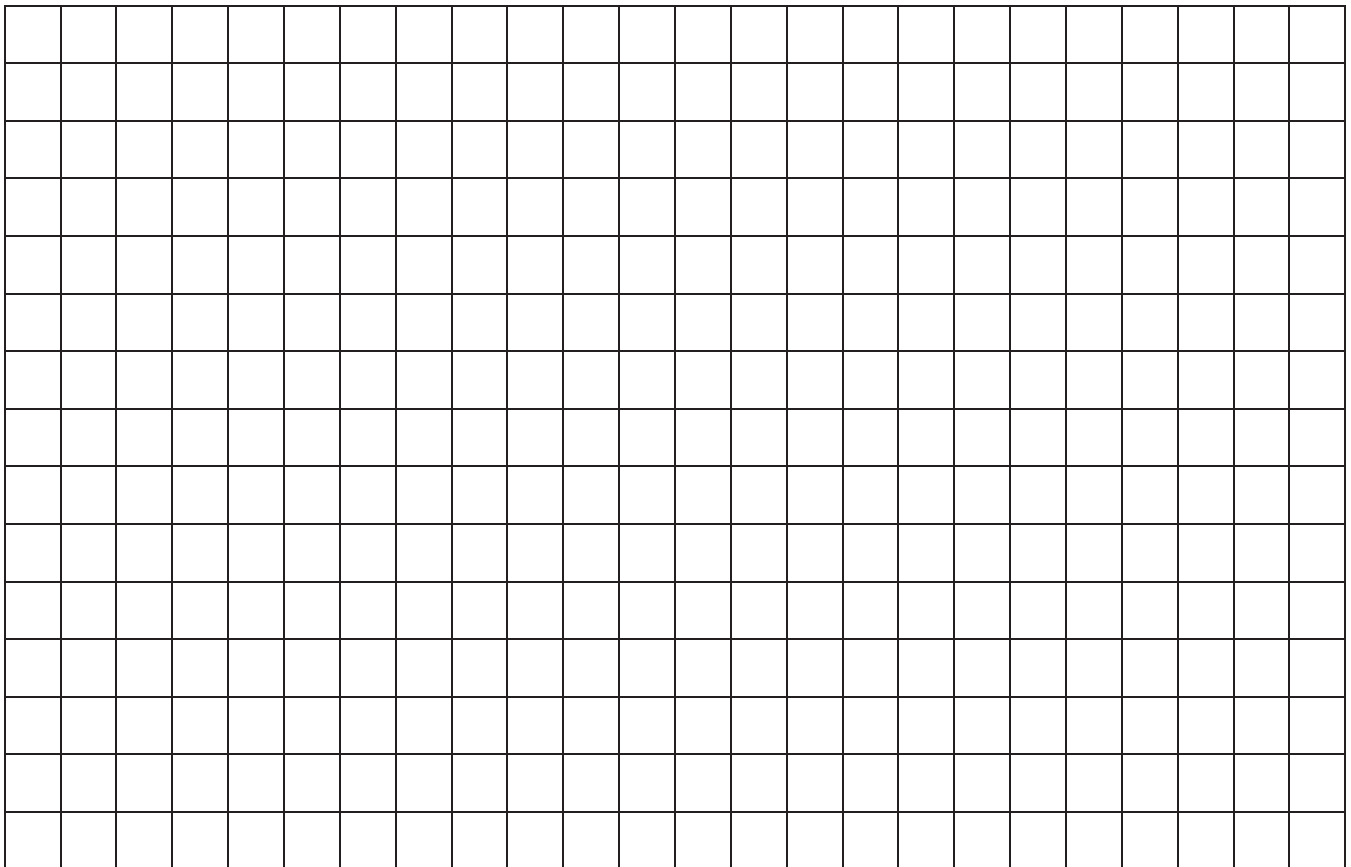
3. Explain how you know the rectangles you created in Problem 2(b) have the correct area.

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Lesson 7:   Reason about composing and decomposing polygons using tetrominoes.

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Name _____   Date _____

1. Fold and cut the square on the diagonal. Draw and label your 2 new shapes below.

2. Fold and cut one of the triangles in half. Draw and label your 2 new shapes below.

3. Fold twice, and cut your large triangle. Draw and label your 2 new shapes below.

4. Fold and cut your trapezoid in half. Draw and label your 2 new shapes below.

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Lesson 8:   Create a tangram puzzle and observe relationships among the shapes.

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5. Fold and cut one of your trapezoids. Draw and label your 2 new shapes below.

6. Fold and cut your second trapezoid. Draw and label your 2 new shapes below.

7. Reconstruct the original square using the seven shapes.

   a. Draw lines inside the square below to show how the shapes go together to form the square. The first one has been done for you.
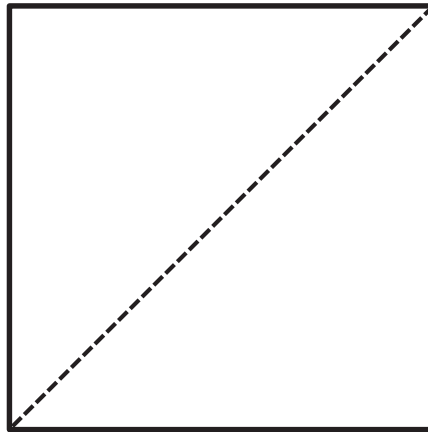
   b. Describe the process of forming the square. What was easy, and what was challenging?

Name _____   Date _____

1. Draw a line to divide the square below into 2 equal triangles.
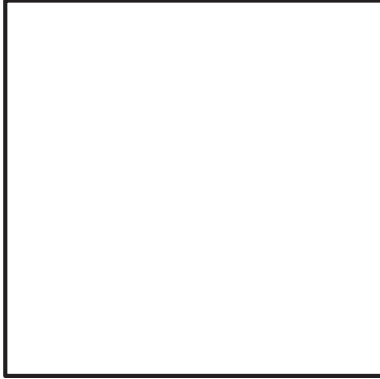
2. Draw a line to divide the triangle below into 2 equal, smaller triangles.
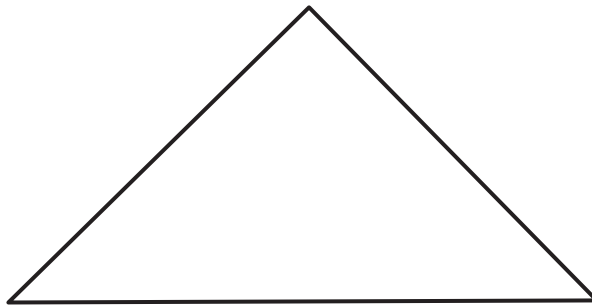
3. Draw a line to divide the trapezoid below into 2 equal trapezoids.

4. Draw 2 lines to divide the quadrilateral below into 4 equal triangles.
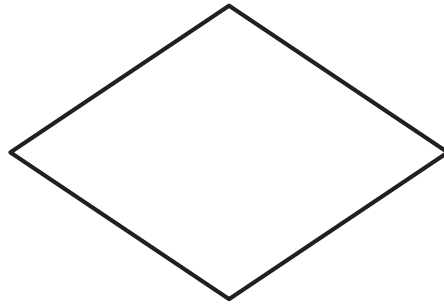
5. Draw 4 lines to divide the square below into 8 equal triangles.
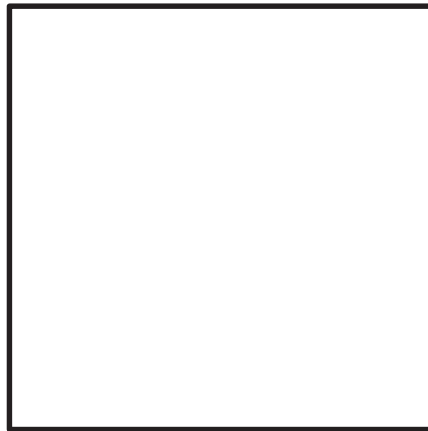
6. Describe the steps you took to divide the square in Problem 5 into 8 equal triangles.

Name _____   Date _____

1. Use at least two tangram pieces to make and draw two of each of the following shapes. Draw lines to show where the tangram pieces meet.

    a. A rectangle that does not have all equal sides.

    b. A triangle.

    c. A parallelogram.

    d. A trapezoid.

2. Use your two smallest triangles to create a square, a parallelogram, and a triangle. Show how you created them below.

3. Create your own shape on a separate sheet of paper using all seven pieces. Describe its attributes below.

4. Trade your outline with a partner to see if you can re-create her shape using your tangram pieces. Reflect on your experience below. What was easy? What was challenging?

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Lesson 9:   Reason about composing and decomposing polygons using tangrams.

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Name _____   Date _____

1. Use at least two tangram pieces to make and draw each of the following shapes. Draw lines to show where the tangram pieces meet.

    a. A triangle.

    b. A square.

    c. A parallelogram.

    d. A trapezoid.

2. Use your tangram pieces to create the cat below. Draw lines to show where the tangram pieces meet.
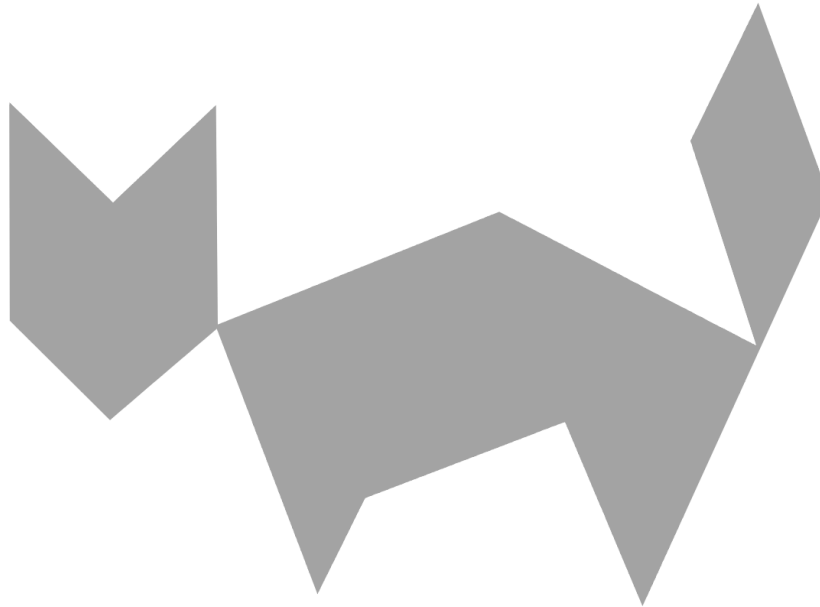
3. Use the five smallest tangram pieces to make a square. Sketch your square below, and draw lines to show where the tangram pieces meet.

Lesson 9: Reason about composing and decomposing polygons using tangrams.

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Name _____   Date _____

1. Use a 2-inch square to answer the questions below.

    a. Trace the square in the space below with a red crayon.

    b. Trace the new shape you made with the square in the space below with a red crayon.

    c. Which shape has a greater perimeter? How do you know?

    d. Color the inside of the shapes in Problem 1 (a) and (b) with a blue crayon.

Lesson 10:   Decompose quadrilaterals to understand perimeter as the boundary
                     of a shape.

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e. Which color represents the perimeters of the shapes? How do you know?

f. What does the other color represent? How do you know?

g. Which shape has a greater area? How do you know?

2. a. Outline the perimeter of the shapes below with a red crayon.
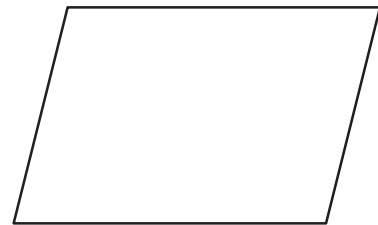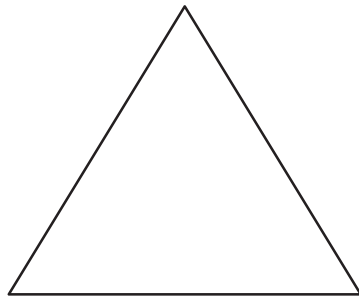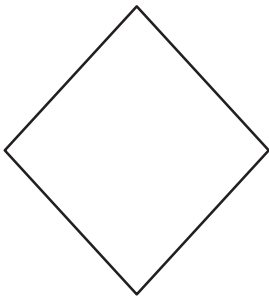
b. Explain how you know you outlined the perimeters of the shapes above.

3. Outline the perimeter of this piece of paper with a highlighter.

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Lesson 10:   Decompose quadrilaterals to understand perimeter as the boundary
of a shape.

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Name _____   Date _____

1. Trace the perimeter of the shapes below.
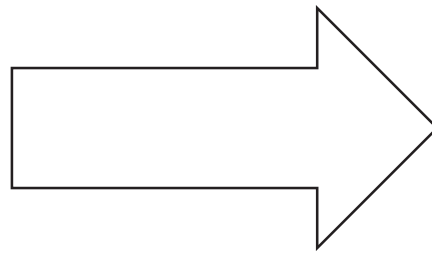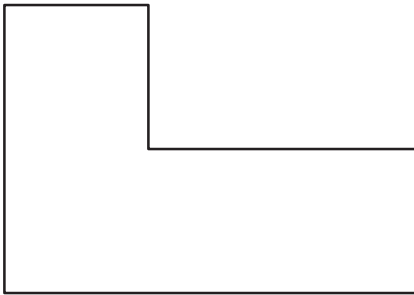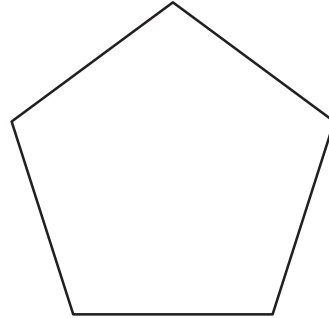
    a. Explain how you know you traced the perimeters of the shapes above.

    b. Explain how you could use a string to figure out which shape above has the greatest perimeter.

Lesson 10:   Decompose quadrilaterals to understand perimeter as the boundary of a shape.

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2. Draw a rectangle on the grid below.
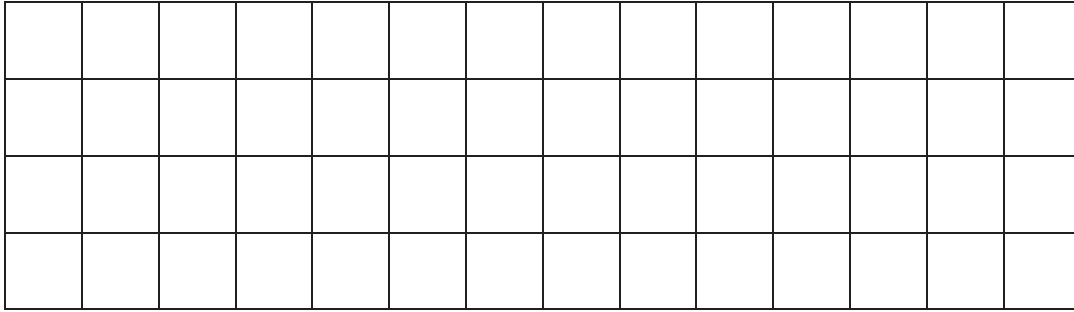
   a. Trace the perimeter of the rectangle.

   b. Shade the area of the rectangle.

   c. How is the perimeter of the rectangle different from the area of the rectangle?

3. Maya draws the shape shown below. Noah colors the inside of Maya's shape as shown. Noah says he colored the perimeter of Maya's shape. Maya says Noah colored the area of her shape. Who is right? Explain your answer.

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Lesson 10: Decompose quadrilaterals to understand perimeter as the boundary of a shape.

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Name _____   Date _____

1. Follow the directions below using the shape you created yesterday.

    a. Tessellate your shape on a blank piece of paper.

    b. Color your tessellation to create a pattern.

    c. Outline the perimeter of your tessellation with a highlighter.

    d. Use a string to measure the perimeter of your tessellation.

2. Compare the perimeter of your tessellation to a partner's. Whose tessellation has a greater perimeter? How do you know?

3. How could you increase the perimeter of your tessellation?

4. How would overlapping your shape when you tessellated change the perimeter of your tessellation?

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Lesson 11:   Tessellate to understand perimeter as the boundary of a shape. (Optional.)

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Name _____   Date _____

1. Samson tessellates regular hexagons to make the shape below.
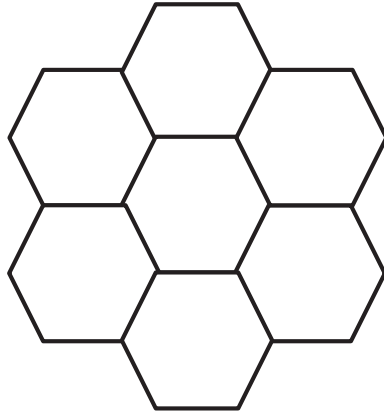
    a. Outline the perimeter of Samson's new shape with a highlighter.

    b. Explain how Samson could use a string to measure the perimeter of his new shape.

    c. How many sides does his new shape have?

    d. Shade in the area of his new shape with a colored pencil.

2. Estimate to draw at least four copies of the given triangle to make a new shape, without gaps or overlaps. Outline the perimeter of your new shape with a highlighter. Shade in the area with a colored pencil.

EUREKA MATH™   **Lesson 11:** Tessellate to understand perimeter as the boundary of a shape. (Optional.)   **44**

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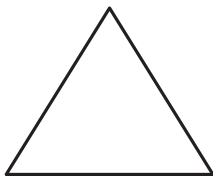
3. The marks on the strings below show the perimeters of Shyla's and Frank's shapes. Whose shape has a greater perimeter? How do you know?

Shyla's String:

Frank's String:

4. India and Theo use the same shape to create the tessellations shown below.

India's Tessellation   **Theo's Tessellation**
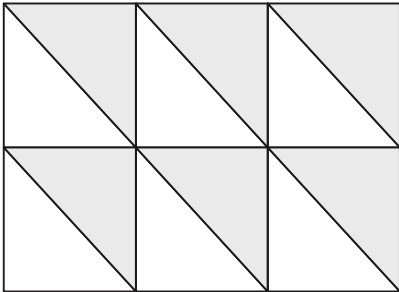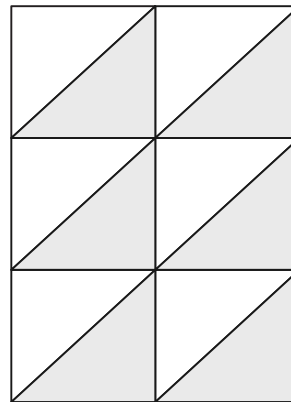
a. Estimate to draw the shape India and Theo used to make their tessellations.

b. Theo says both tessellations have the same perimeter. Do you think Theo is right? Why or why not?

Name _____   Date _____

1. Measure and label the side lengths of the shapes below in centimeters. Then, find the perimeter of each shape.

   a.

   Perimeter = _____cm +_____cm +_____cm +_____cm

   = _____ cm
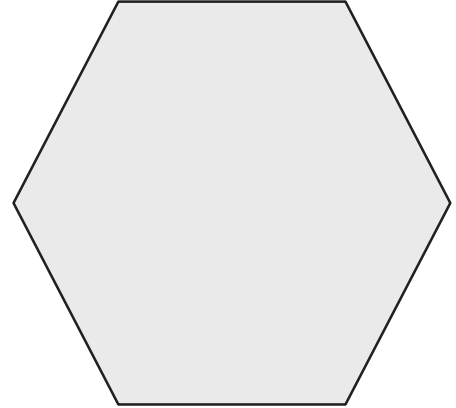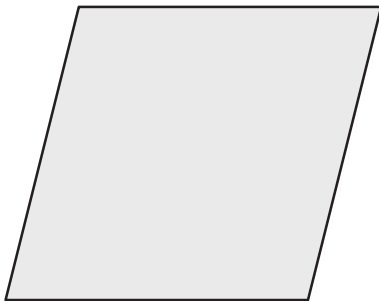
   b.

   Perimeter = _____

   = _____ cm

   c.

   Perimeter = _____

   = _____ cm

   d.

   Perimeter = _____

   = _____ cm

   e.

   Perimeter = _____

   = _____ cm
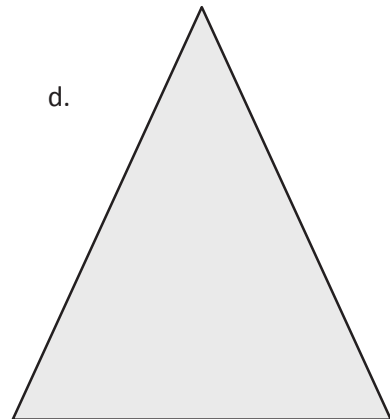
2. Carson draws two triangles to create the new shape shown below. Use a ruler to find the side lengths of Carson's shape in centimeters. Then, find the perimeter.
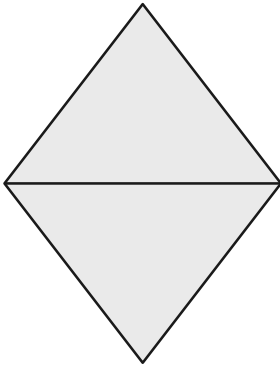
3. Hugh and Daisy draw the shapes shown below. Measure and label the side lengths in centimeters. Whose shape has a greater perimeter? How do you know?

**Hugh's Shape**
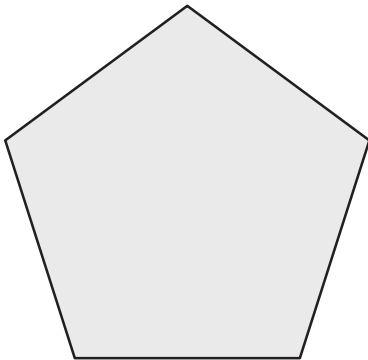
Daisy's Shape
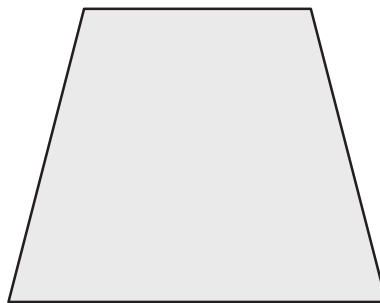
4. Andrea measures one side length of the square below and says she can find the perimeter with that measurement. Explain Andrea's thinking. Then, find the perimeter in centimeters.

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Lesson 12:   Measure side lengths in whole number units to determine the perimeter of polygons.

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Name _____ Date _____

1. Measure and label the side lengths of the shapes below in centimeters. Then, find the perimeter of each shape.

a.

Perimeter = _____cm +_____cm +_____cm

= _____ cm

b.

Perimeter = _____

= _____ cm

c.

Perimeter = _____

= _____ cm

d.

Perimeter = _____

= _____ cm

e.

Perimeter = _____

= _____ cm

EUREKA MATH™

Lesson 12: Measure side lengths in whole number units to determine the perimeter of polygons.

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2. Melinda draws two trapezoids to create the hexagon shown below. Use a ruler to find the side lengths of Melinda's hexagon in centimeters. Then, find the perimeter.
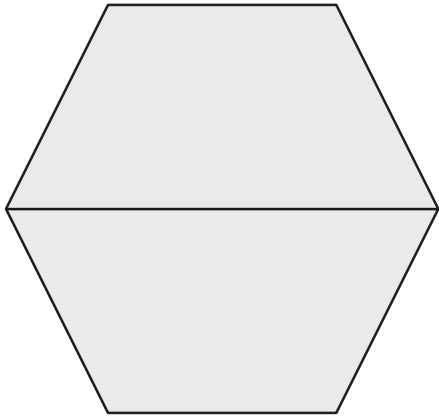
3. Victoria and Eric draw the shapes shown below. Eric says his shape has a greater perimeter because it has more sides than Victoria's shape. Is Eric right? Explain your answer.
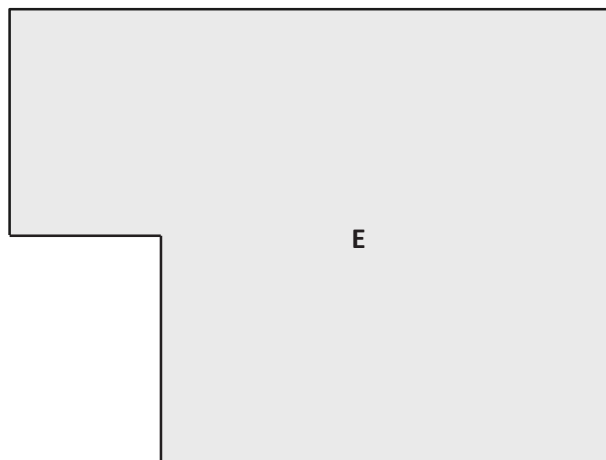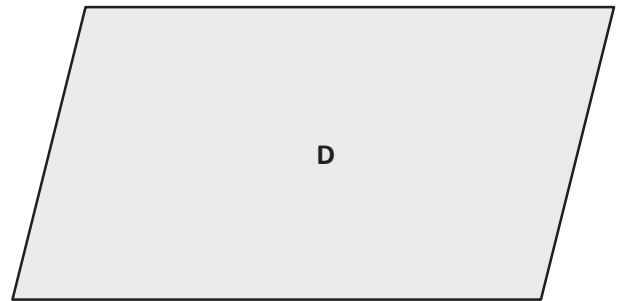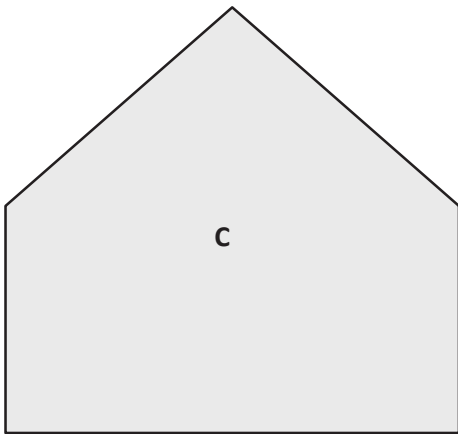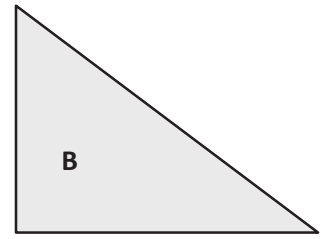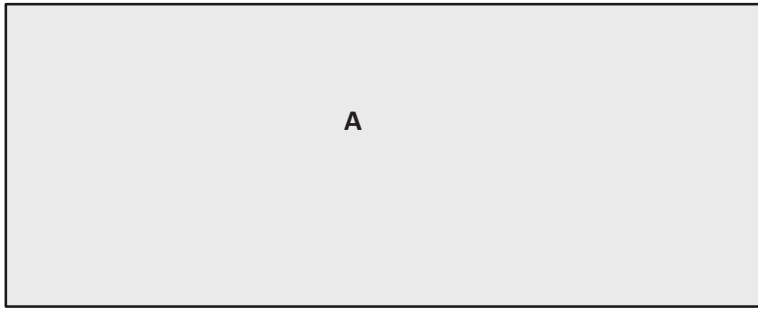
Victoria's Shape
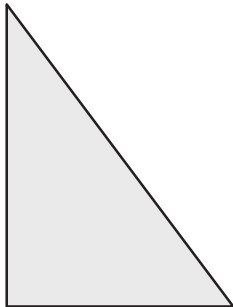
Eric's Shape

4. Jamal uses his ruler and a right angle tool to draw the rectangle shown below. He says the perimeter of his rectangle is 32 centimeters. Do you agree with Jamal? Why or why not?
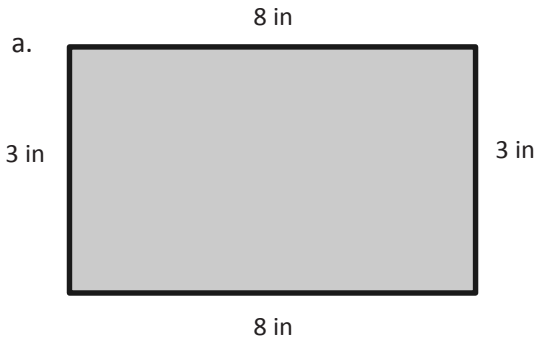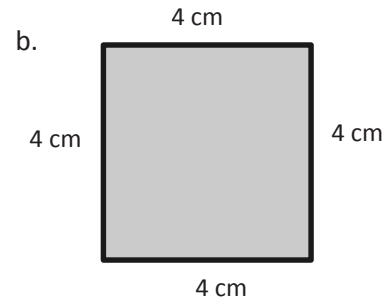
Lesson 12: Measure side lengths in whole number units to determine the perimeter of polygons.

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A

B

C

D

E

shapes

Lesson 12: Measure side lengths in whole number units to determine the perimeter of polygons.

50
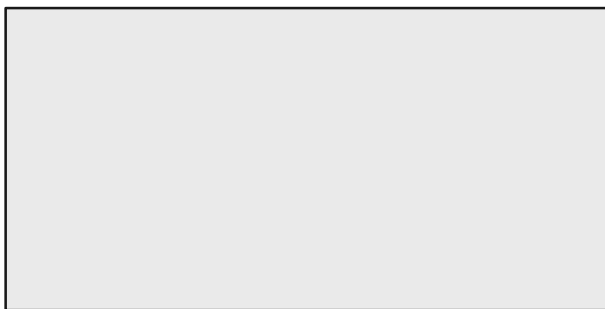
Name _____   Date _____

1. Find the perimeter of the following shapes.
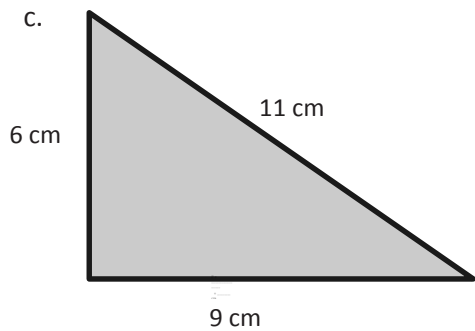
a.

8 in

3 in   3 in

8 in

P = 3 in + 8 in + 3 in + 8 in

= _____ in

b.

4 cm

4 cm   4 cm

4 cm

P = _____ cm + _____ cm + _____ cm + _____ cm

= _____ cm

c.

6 cm

11 cm

9 cm

P = _____ cm + _____ cm + _____ cm

= _____ cm

d.

5 m

7 m   9 m

15 m

P = _____ m + _____ m + _____ m + _____ m

= _____ m

e.

9 in

3 in

2 in

2 in

9 in

P = _____ in + _____ in + _____ in + _____ in + _____ in

= _____ in

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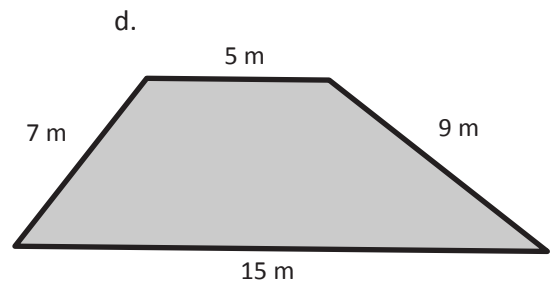
2. Alan's rectangular swimming pool is 10 meters long and 16 meters wide. What is the perimeter?

16 m

10 m   10 m

16 m
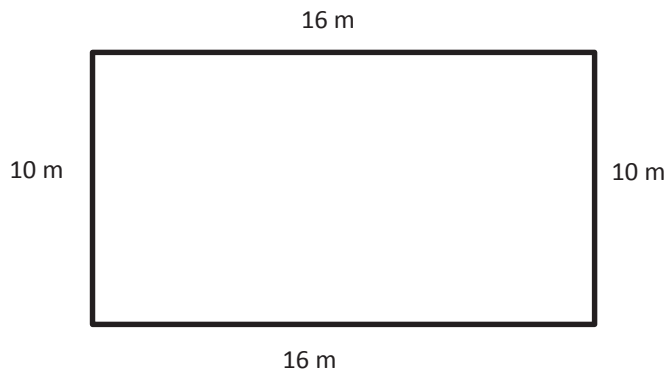
3. Lila measures each side of the shape below.

3 in

2 in

4 in   6 in

9 in
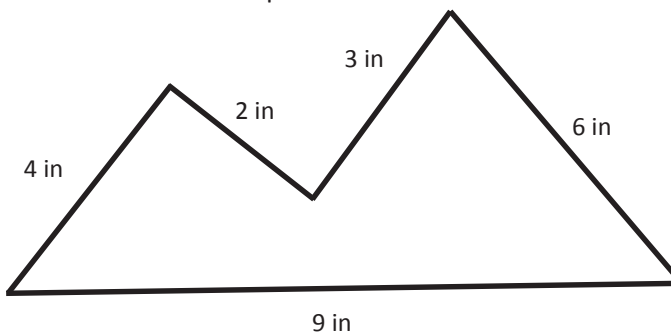
a. What is the perimeter of the shape?

b. Lila says the shape is a pentagon. Is she correct? Explain why or why not.

Name _____   Date _____

1. Find the perimeters of the shapes below. Include the units in your equations. Match the letter inside each shape to its perimeter to solve the riddle. The first one has been done for you.

7 in   q   7 in
7 in

P = 7 in + 7 in + 7 in

P = 21 in

6 ft   6 ft
r
9 ft   9 ft
6 ft

7 cm
5 cm   s   5 cm
7 cm

5 yd
7 yd   a   7 yd
9 yd

4 in   4 in
m
4 in   4 in

8 cm
5 cm   e   5 cm
8 cm

7 m
3 m   u   4 m
6 m

4 m
3 m   l   2 m
2 m
4 m
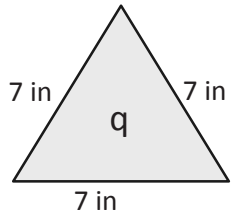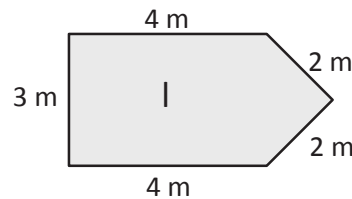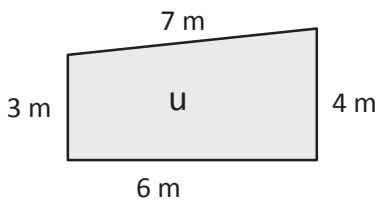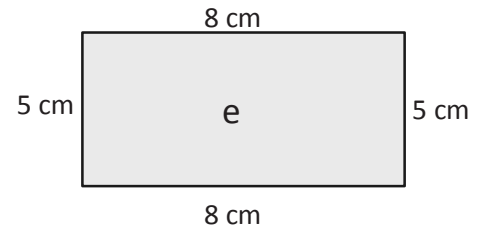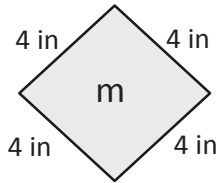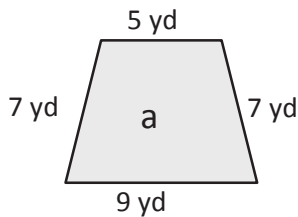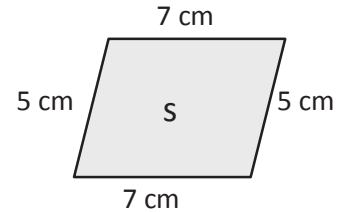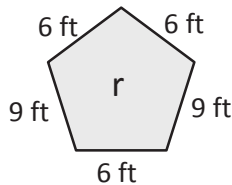
What kind of meals do math teachers eat?

____ ____ ____ ____ ____ ____   ____ ____ ____ ____ ____ !

24   21   20   28   36   26   16   26   28   15   24

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2. Alicia's rectangular garden is 33 feet long and 47 feet wide. What is the perimeter of Alicia's garden?

47 ft

33 ft   33 ft

47 ft
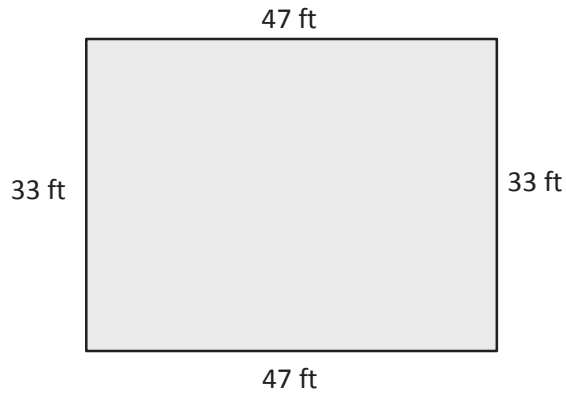
3. Jaques measured the side lengths of the shape below.

4 in

3 in

5 in

2 in

5 in   4 in

3 in

7 in
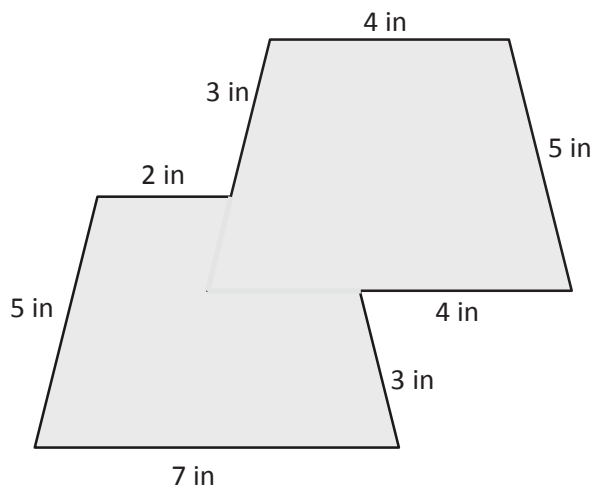
a. Find the perimeter of Jaques's shape.

b. Jaques says his shape is an octagon. Is he right? Why or why not?

Name _____   Date _____

1. Label the unknown side lengths of the regular shapes below. Then, find the perimeter of each shape.

    a.

    8 in

    Perimeter = _____ in

    b.

    7 ft

    Perimeter = _____ ft

    c.

    9 m

    Perimeter = _____ m

    d.

    6 in

    Perimeter = _____ in

2. Label the unknown side lengths of the rectangle below. Then, find the perimeter of the rectangle.

    2 cm

    7 cm

    Perimeter = _____ cm

EUREKA MATH   **Lesson 14:**   Determine the perimeter of regular polygons and rectangles when   **55**
                                       whole number measurements are unknown.

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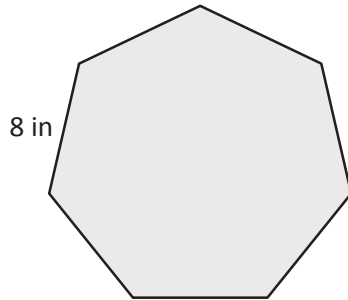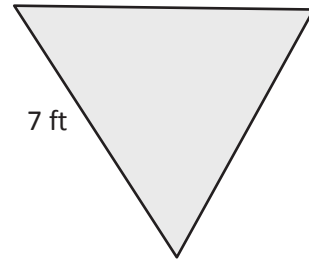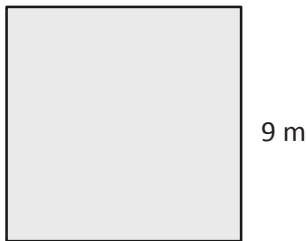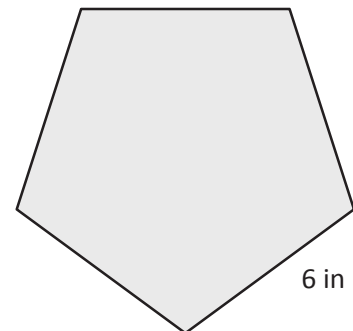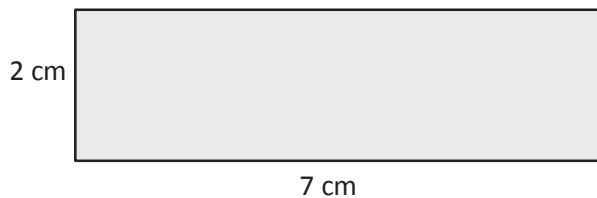
3. David draws a regular octagon and labels a side length as shown below. Find the perimeter of David's octagon.

6 cm
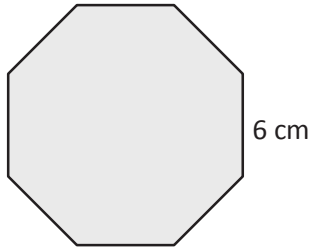
4. Paige paints an 8-inch by 9-inch picture for her mom's birthday. What is the total length of wood that Paige needs to make a frame for the picture?

5. Mr. Spooner draws a regular hexagon on the board. One of the sides measures 4 centimeters. Giles and Xander find the perimeter. Their work is shown below. Whose work is correct? Explain your answer.

Giles's Work	**Xander's Work**
Perimeter = 4 cm + 4 cm + 4 cm + 4 cm + 4 cm + 4 cm	Perimeter = 6 × 4 cm
Perimeter = 24 cm	Perimeter = 24 cm

Name _____   Date _____

1. Label the unknown side lengths of the regular shapes below. Then, find the perimeter of each shape.

a.

4 in

Perimeter = _____ in

b.

8 cm

Perimeter = _____ cm

c.

9 m

Perimeter = _____ m

d.

6 in

Perimeter = _____ in

2. Label the unknown side lengths of the rectangle below. Then, find the perimeter of the rectangle.

4 cm

9 cm   Perimeter = _____ cm

EUREKA MATH

Lesson 14:   Determine the perimeter of regular polygons and rectangles when whole number measurements are unknown.

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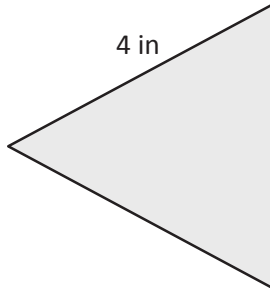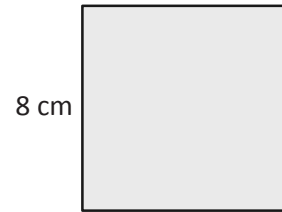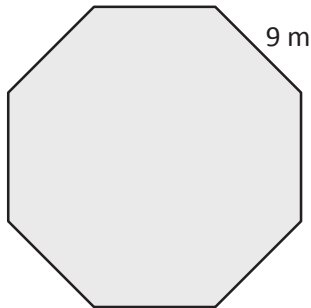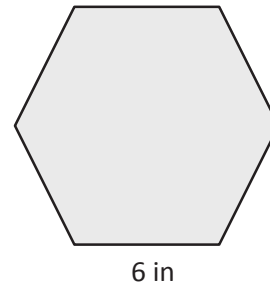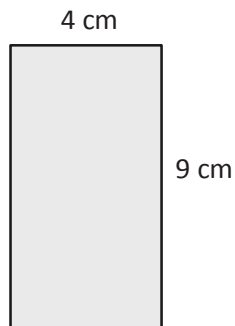
3. Roxanne draws a regular pentagon and labels a side length as shown below. Find the perimeter of Roxanne's pentagon.

7 cm
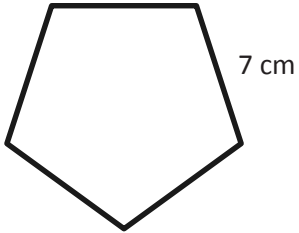
4. Each side of a square field measures 24 meters. What is the perimeter of the field?

5. What is the perimeter of a rectangular sheet of paper that measures 8 inches by 11 inches?

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Lesson 14: Determine the perimeter of regular polygons and rectangles when whole number measurements are unknown.

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Name _____   Date _____

1. Mrs. Kozlow put a border around a 5-foot by 6-foot rectangular bulletin board. How many feet of border did Mrs. Kozlow use?

2. Jason built a model of the Pentagon for a social studies project. He made each outside wall 33 centimeters long. What is the perimeter of Jason's model pentagon?

3. The Holmes family plants a rectangular 8-yard by 9-yard vegetable garden. How many yards of fencing do they need to put a fence around the garden?

Lesson 15:   Solve word problems to determine perimeter with given side lengths.

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4. Marion paints a 5-pointed star on her bedroom wall. Each side of the star is 18 inches long. What is the perimeter of the star?
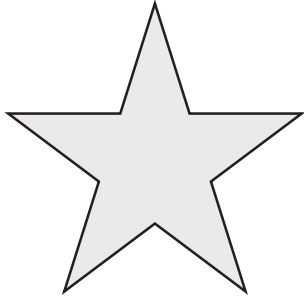
5. The soccer team jogs around the outside of the soccer field twice to warm up. The rectangular field measures 60 yards by 100 yards. What is the total number of yards the team jogs?

6. Troop 516 makes 3 triangular flags to carry at a parade. They sew ribbon around the outside edges of the flags. The flags' side lengths each measure 24 inches. How many inches of ribbon does the troop use?

Lesson 15: Solve word problems to determine perimeter with given side lengths.

60

Name _____   Date _____

1.   Miguel glues a ribbon border around the edges of a 5-inch by 8-inch picture to create a frame. What is the total length of ribbon Miguel uses?

2.   A building at Elmira College has a room shaped like a regular octagon. The length of each side of the room is 5 feet. What is the perimeter of this room?

3.   Manny fences in a rectangular area for his dog to play in the backyard. The area measures 35 yards by 45 yards. What is the total length of fence that Manny uses?

4. Tyler uses 6 craft sticks to make a hexagon. Each craft stick is 6 inches long. What is the perimeter of Tyler's hexagon?

5. Francis made a rectangular path from her driveway to the porch. The width of the path is 2 feet. The length is 28 feet longer than the width. What is the perimeter of the path?

6. The gym teacher uses tape to mark a 4-square court on the gym floor as shown. The outer square has side lengths of 16 feet. What is the total length of tape the teacher uses to mark Square A?

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Lesson 15:   Solve word problems to determine perimeter with given side lengths.

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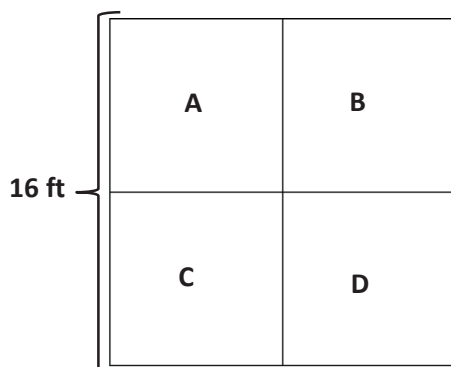
Name _____   Date _____

1. Find the perimeter of 10 circular objects to the nearest quarter inch using string. Record the name and perimeter of each object in the chart below.

Object	Perimeter (to the nearest quarter inch)

a. Explain the steps you used to find the perimeter of the circular objects in the chart above.

b. Could the same process be used to find the perimeter of the shape below? Why or why not?

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Lesson 16:   Use string to measure the perimeter of various circles to the nearest quarter inch.

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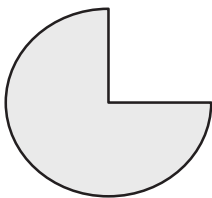
2. Can you find the perimeter of the shape below using just your ruler? Explain your answer.
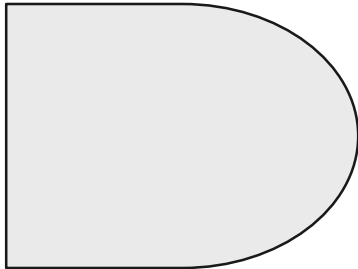
3. Molly says the perimeter of the shape below is $6\frac{1}{4}$ inches. Use your string to check her work. Do you agree with her? Why or why not?
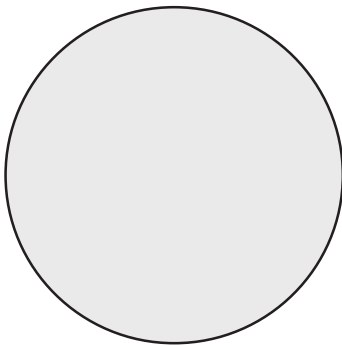
4. Is the process you used to find the perimeter of a circular object an efficient method to find the perimeter of a rectangle? Why or why not?

Lesson 16:   Use string to measure the perimeter of various circles to the nearest quarter inch.

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Name _____   Date _____

1. a. Find the perimeter of 5 circular objects from home to the nearest quarter inch using string. Record the name and perimeter of each object in the chart below.

Object	Perimeter (to the nearest quarter inch)
Example: Peanut Butter Jar Cap	$9\frac{1}{2}$ inches

b. Explain the steps you used to find the perimeter of the circular objects in the chart above.

Lesson 16:   Use string to measure the perimeter of various circles to the nearest quarter inch.

65

2. Use your string and ruler to find the perimeter of the two shapes below to the nearest quarter inch.

A

B
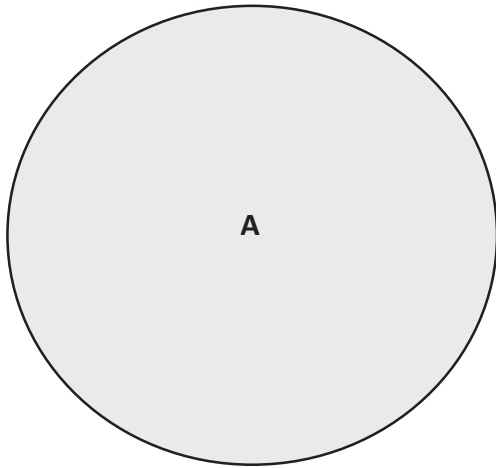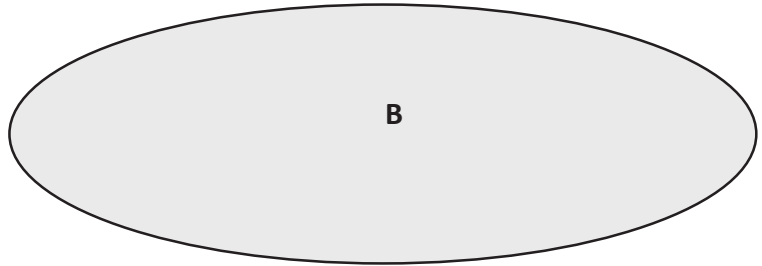
Perimeter = _____   Perimeter = _____

a. Which shape has a greater perimeter?

b. Find the difference between the two perimeters.

3. Describe the steps you took to find the perimeter of the objects in Problem 2. Would you use this method to find the perimeter of a square? Explain why or why not.

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Lesson 16:   Use string to measure the perimeter of various circles to the nearest quarter inch.

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Name _____ Date _____

1. The shapes below are made up of rectangles. Label the unknown side lengths. Then, write and solve an equation to find the perimeter of each shape.

a.

2 cm

3 cm

2 cm

4 cm

P =

b.

5 ft

2 ft

1 ft

2 ft   2 ft

P =

c.

6 m

2 m

4 m

2 m

2 m

P =

d.

2 yd

2 yd

4 yd

2 yd

2 yd

2 yd

2 yd

7 yd

P =

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Lesson 17: Use all four operations to solve problems involving perimeter and unknown measurements.

67
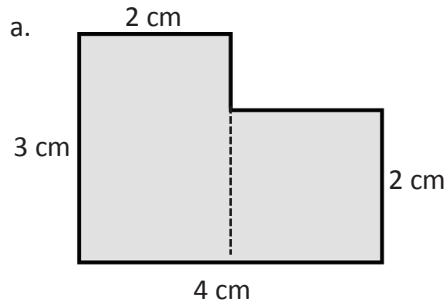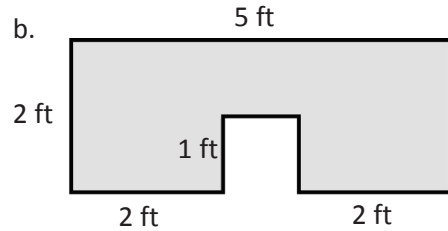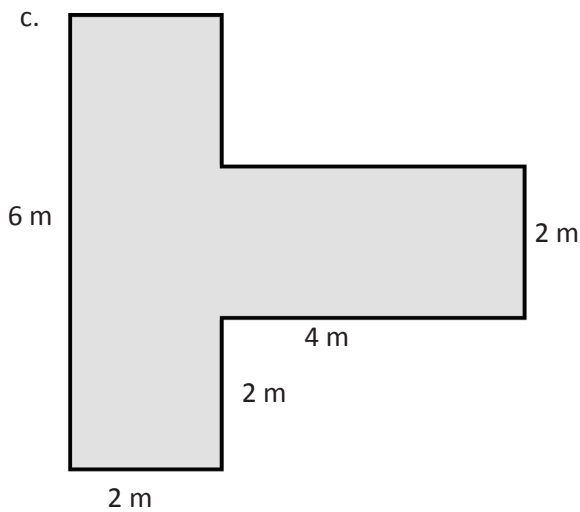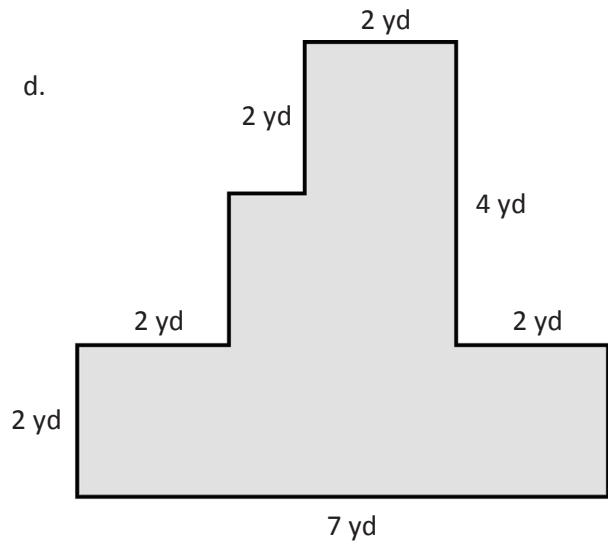
2. Nathan draws and labels the square and rectangle below. Find the perimeter of the new shape.
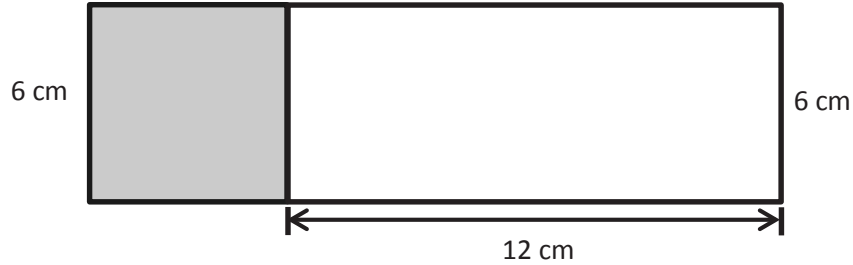
6 cm 6 cm

12 cm

3. Label the unknown side lengths. Then, find the perimeter of the shaded rectangle.

8 in a in

7 in b in

2 in

16 in

Lesson 17: Use all four operations to solve problems involving perimeter and unknown measurements.

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Name _____ Date _____

1. The shapes below are made up of rectangles. Label the unknown side lengths. Then, write and solve an equation to find the perimeter of each shape.

a.

7 m

2 m

9 m

4 m

P =

b.

8 cm

6 cm

4 cm

3 cm

2 cm

5 cm

2 cm

P =

c.

6 in

4 in   4 in

2 in

12 in

P =

d.

2 ft

3 ft

3 ft

7 ft

1 ft

8 ft

P =

Lesson 17: Use all four operations to solve problems involving perimeter and unknown measurements.

69

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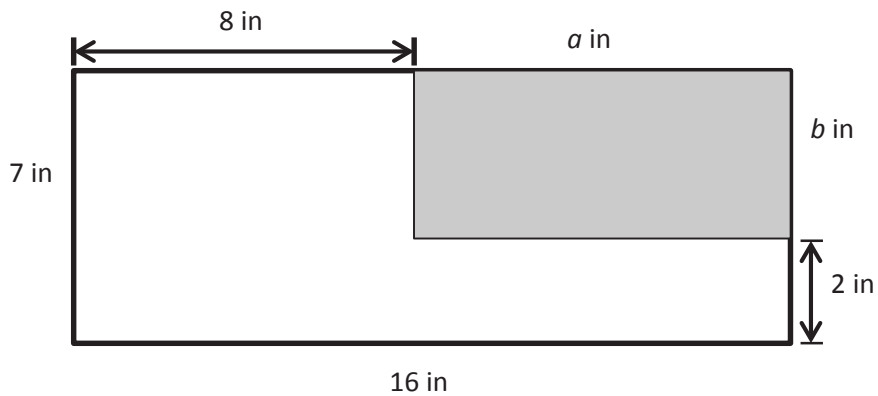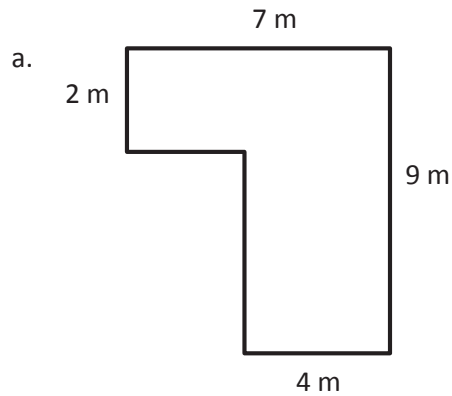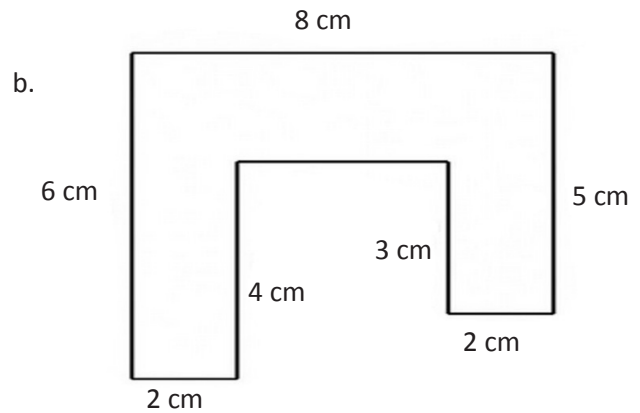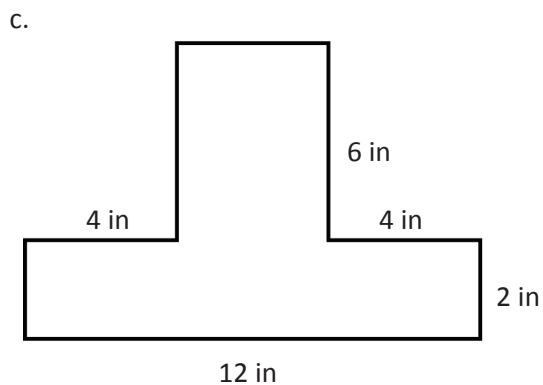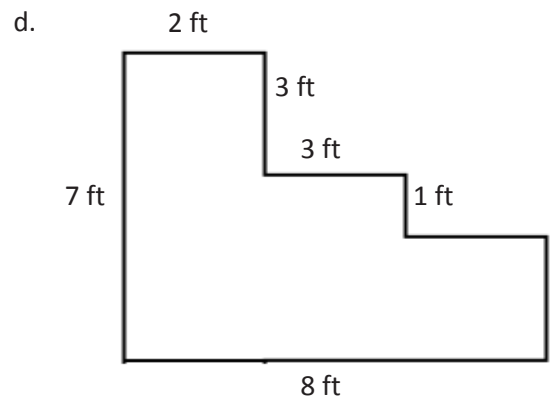
2. Sari draws and labels the squares and rectangle below. Find the perimeter of the new shape.
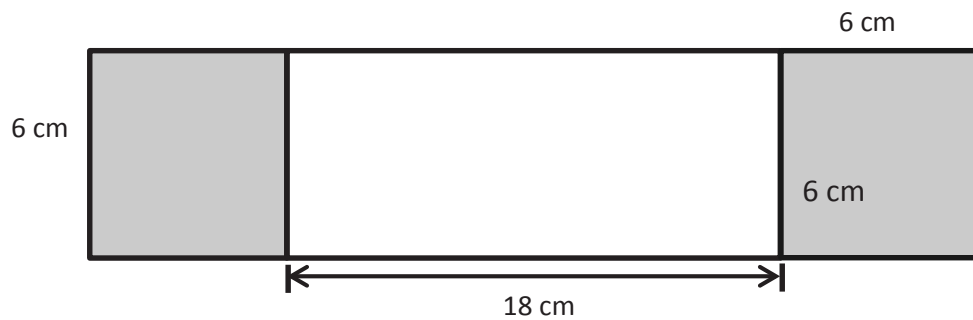
6 cm

6 cm

6 cm

18 cm

3. Label the unknown side lengths. Then, find the perimeter of the shaded rectangle.

18 in

2 in

8 in

b in

5 in

a in

Lesson 17:   Use all four operations to solve problems involving perimeter and
             unknown measurements.

70
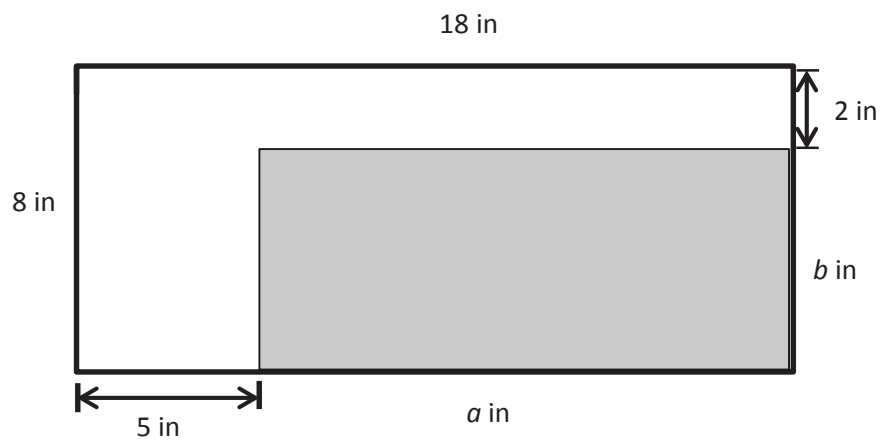
Name _____   Date _____

1. Use unit squares to build as many rectangles as you can with an area of 24 square units. Shade in squares on your grid paper to represent each rectangle that you made with an area of 24 square units.

    a. Estimate to draw and label the side lengths of each rectangle you built in Problem 1. Then, find the perimeter of each rectangle. One rectangle is done for you.
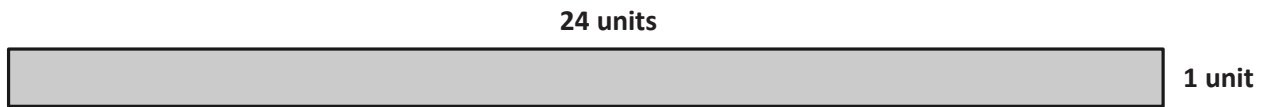
24 units

1 unit

P = 24 units + 1 unit + 24 units + 1 unit = <u>50 units</u>

    b. The areas of the rectangles in part (a) above are all the same. What do you notice about the perimeters?

Lesson 18: Construct rectangles from a given number of unit squares and determine the perimeters.

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2. Use unit square tiles to build as many rectangles as you can with an area of 16 square units. Estimate to draw each rectangle below. Label the side lengths.

    a. Find the perimeters of the rectangles you built.

    b. What is the perimeter of the square? Explain how you found your answer.

3. Doug uses square unit tiles to build rectangles with an area of 15 square units. He draws the rectangles as shown below but forgets to label the side lengths. Doug says that Rectangle A has a greater perimeter than Rectangle B. Do you agree? Why or why not?

Rectangle A

Rectangle B

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Lesson 18:   Construct rectangles from a given number of unit squares and determine the perimeters.

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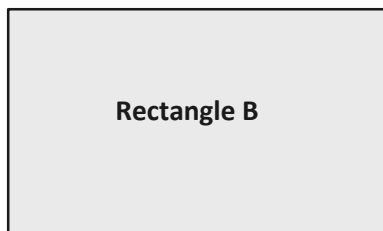
Name _____   Date _____

1. Shade in squares on the grid below to create as many rectangles as you can with an area of 18 square centimeters.
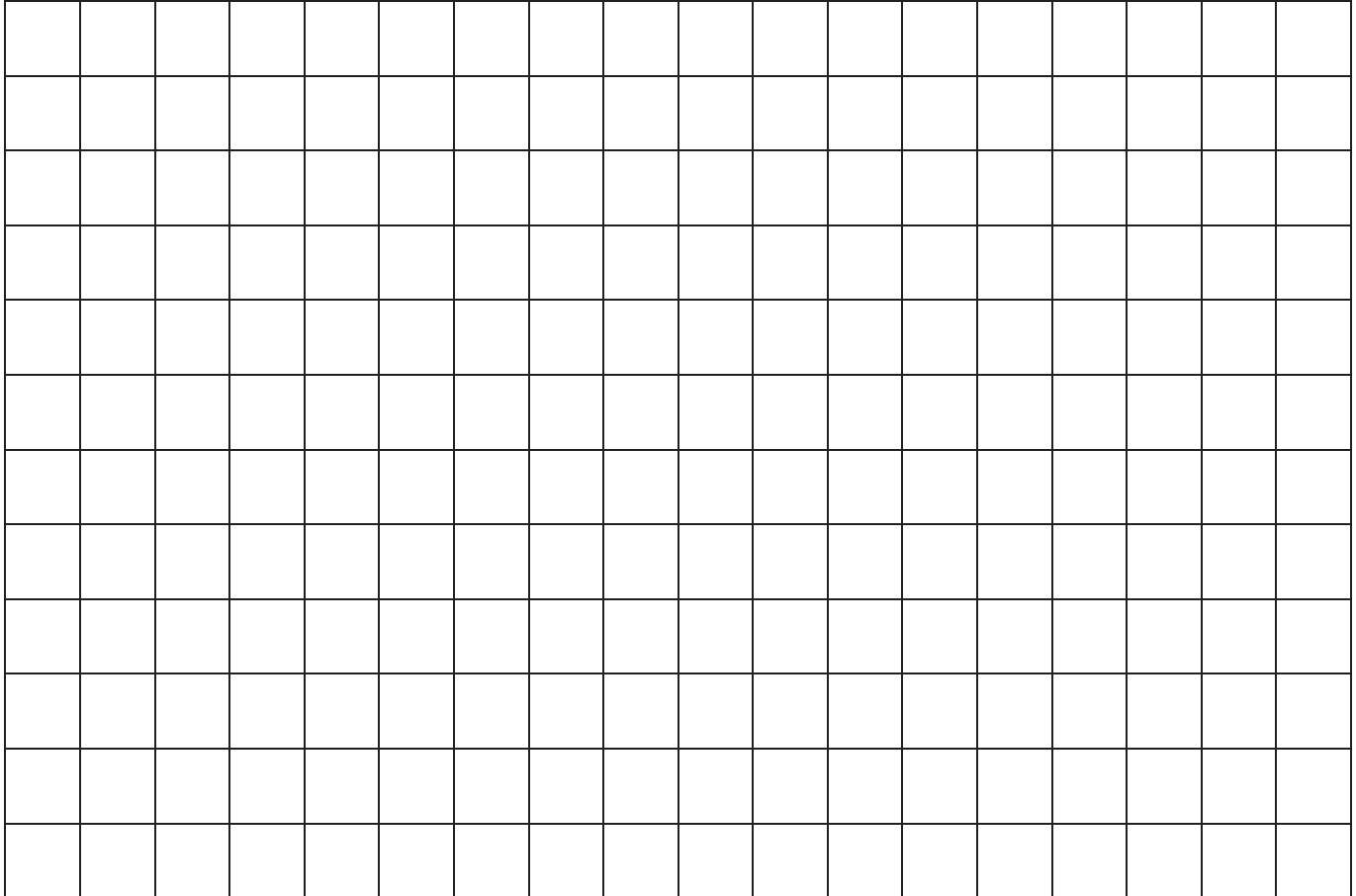
2. Find the perimeter of each rectangle in Problem 1 above.

Lesson 18: Construct rectangles from a given number of unit squares and determine the perimeters.

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3. Estimate to draw as many rectangles as you can with an area of 20 square centimeters. Label the side lengths of each rectangle.

a. Which rectangle above has the greatest perimeter? How do you know just by looking at its shape?

b. Which rectangle above has the smallest perimeter? How do you know just by looking at its shape?

Lesson 18:   Construct rectangles from a given number of unit squares and determine the perimeters.

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grid paper

Lesson 18: Construct rectangles from a given number of unit squares and determine the perimeters.

75

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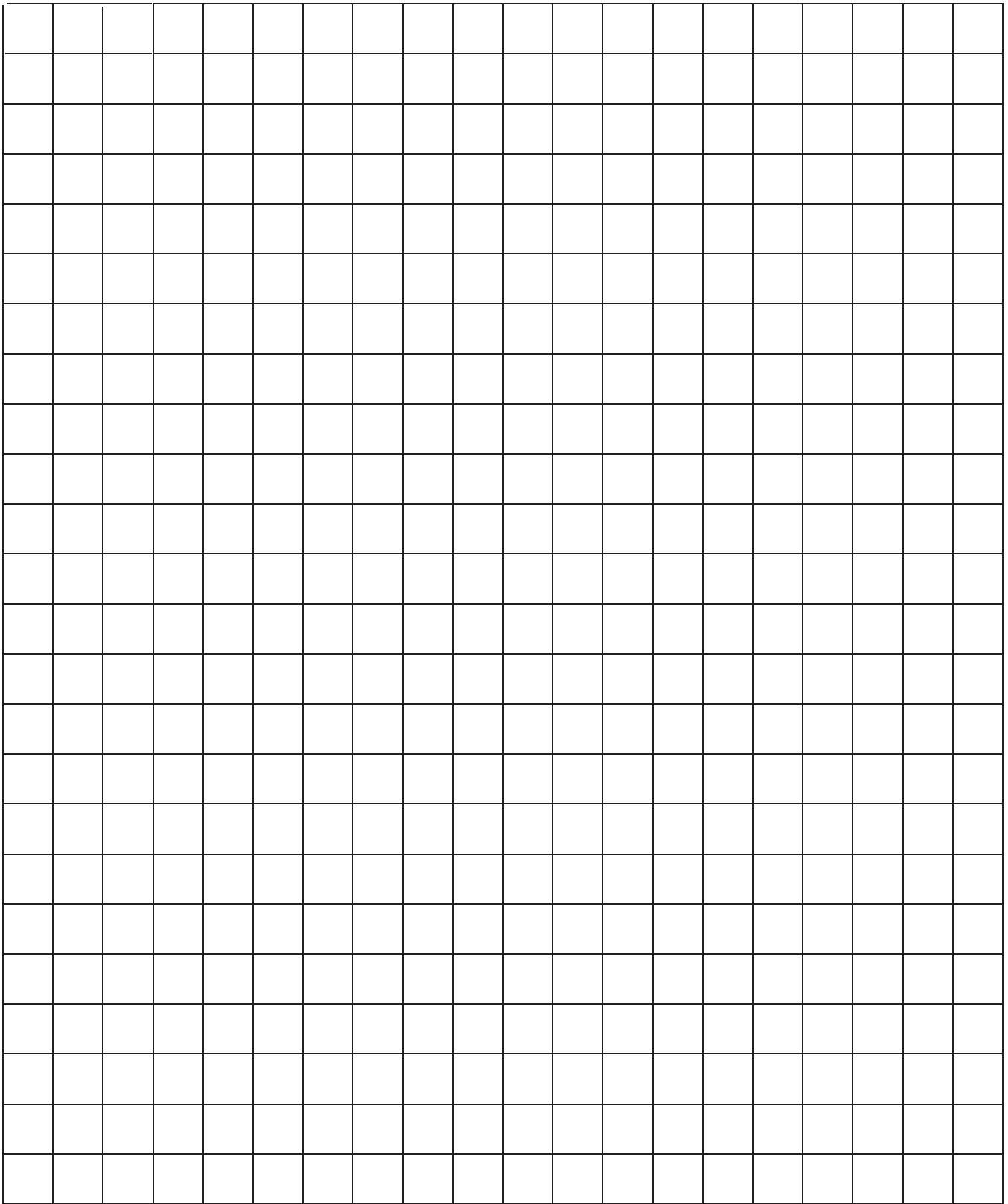
Name _____   Date _____

1. Use unit square tiles to make rectangles for each given number of unit squares. Complete the charts to show how many rectangles you can make for each given number of unit squares. The first one is done for you. You might not use all the spaces in each chart.

Number of unit squares = **12**

Number of rectangles I made: <u>3</u>

Width	Length
1	12
2	6
3	4

Number of unit squares = **13**

Number of rectangles
I made: _____

Width	Length

Number of unit squares = **14**

Number of rectangles
I made: _____

Width	Length

Number of unit squares = **15**

Number of rectangles
I made: _____

Width	Length

Number of unit squares = **16**

Number of rectangles
I made: _____

Width	Length

Number of unit squares = **17**

Number of rectangles
I made: _____

Width	Length

Number of unit squares = **18**

Number of rectangles
I made: _____

Width	Length

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Lesson 19: Use a line plot to record the number of rectangles constructed from a given number of unit squares.

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2. Create a line plot with the data you collected in Problem 1.

Number of Rectangles Made with Unit Squares

12   18

Number of Unit Squares Used | **X = 1 Rectangle** |
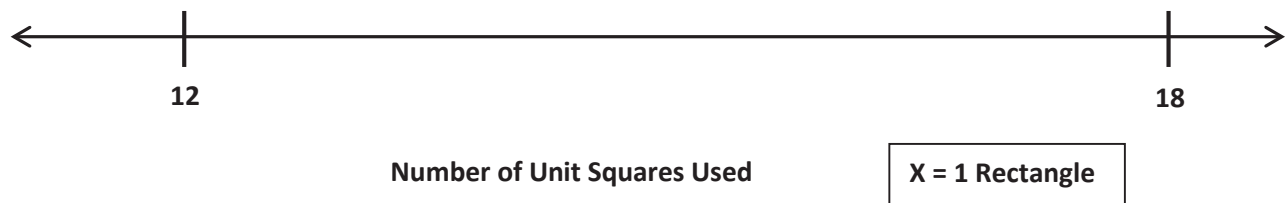
3. Which numbers of unit squares produce three rectangles?

4. Why do some numbers of unit squares, such as 13, only produce one rectangle?

Lesson 19:   Use a line plot to record the number of rectangles constructed from a
given number of unit squares.

77

Name _____ Date _____

1. Cut out the unit squares at the bottom of the page. Then, use them to make rectangles for each given number of unit squares. Complete the charts to show how many rectangles you can make for each given number of unit squares. You might not use all the spaces in each chart.

Number of unit squares = **6**

Number of rectangles
I made: _____

Width	Length

Number of unit squares = **7**

Number of rectangles
I made: _____

Width	Length

Number of unit squares = **8**

Number of rectangles
I made: _____

Width	Length

Number of unit squares = **9**

Number of rectangles
I made: _____

Width	Length

Number of unit squares = **10**

Number of rectangles
I made: _____

Width	Length

Number of unit squares = **11**

Number of rectangles
I made: _____
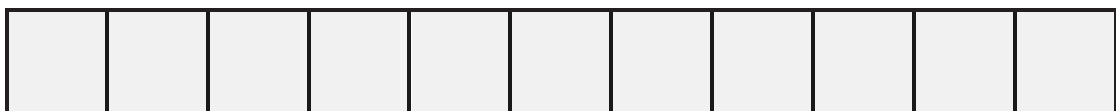
Width	Length

✂ --

Lesson 19: Use a line plot to record the number of rectangles constructed from a given number of unit squares.

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2. Create a line plot with the data you collected in Problem 1.

Number of Rectangles Made with Unit Squares

6   11

Number of Unit Squares Used
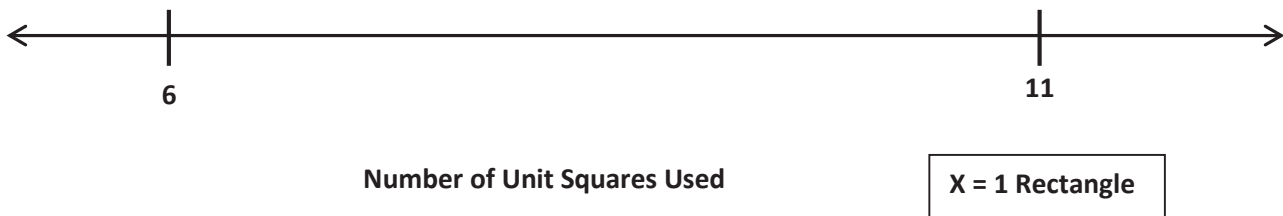
X = 1 Rectangle

a. Luke looks at the line plot and says that all odd numbers of unit squares produce only 1 rectangle. Do you agree? Why or why not?

b. How many X's would you plot for 4 unit squares? Explain how you know.

Lesson 19:   Use a line plot to record the number of rectangles constructed from a given number of unit squares.

79

Name _____   Date _____

1. Use your square unit tiles to build as many rectangles as you can with a perimeter of 12 units.

    a. Estimate to draw your rectangles below. Label the side lengths of each rectangle.

    b. Explain your strategy for finding rectangles with a perimeter of 12 units.

    c. Find the areas of all the rectangles in part (a) above.

    d. The perimeters of all the rectangles are the same. What do you notice about their areas?

Lesson 20:   Construct rectangles with a given perimeter using unit squares and determine their areas.

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2. Use your square unit tiles to build as many rectangles as you can with a perimeter of 14 units.

   a. Estimate to draw your rectangles below. Label the side lengths of each rectangle.

   b. Find the areas of all the rectangles in part (a) above.

   c. Given a rectangle's perimeter, what other information do you need to know about the rectangle to find its area?

Lesson 20: Construct rectangles with a given perimeter using unit squares and determine their areas.

81

Name _____   Date _____

1. Cut out the unit squares at the bottom of the page. Then, use them to make as many rectangles as you can with a perimeter of 10 units.

   a. Estimate to draw your rectangles below. Label the side lengths of each rectangle.

   b. Find the areas of the rectangles in part (a) above.

✂ --

Lesson 20:   Construct rectangles with a given perimeter using unit squares and determine their areas.

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2. Gino uses unit square tiles to make rectangles with a perimeter of 14 units. He draws his rectangles as shown below. Using square unit tiles, can Gino make another rectangle that has a perimeter of 14 units? Explain your answer.

4 units

6 units

1 unit

3 units
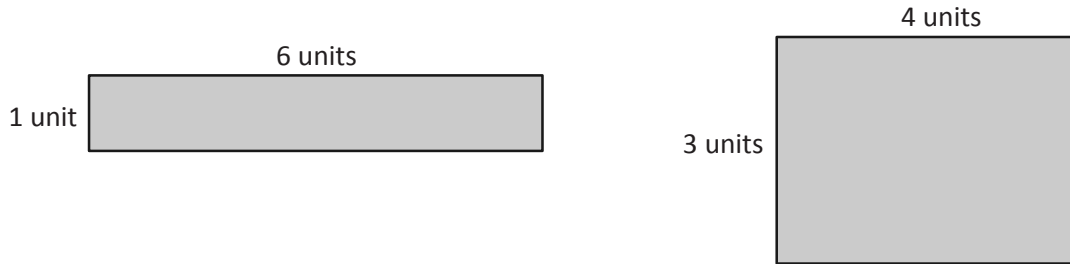
3. Katie draws a square that has a perimeter of 20 centimeters.

    a. Estimate to draw Katie's square below. Label the length and width of the square.

    b. Find the area of Katie's square.

    c. Estimate to draw a different rectangle that has the same perimeter as Katie's square.

    d. Which shape has a greater area, Katie's square or your rectangle?

Lesson 20:   Construct rectangles with a given perimeter using unit squares and determine their areas.

83

Name _____   Date _____

Use the data you gathered from Problem Sets 20 and 21 to complete the charts to show how many rectangles you can create with a given perimeter. You might not use all the spaces in the charts.

Perimeter = 10 units		
Number of rectangles you made: _____		
Width	Length	Area
1 unit	4 units	4 square units

Perimeter = 12 units		
Number of rectangles you made: _____		
Width	Length	Area

Perimeter = 14 units		
Number of rectangles you made: _____		
Width	Length	Area

Perimeter = 16 units		
Number of rectangles you made: _____		
Width	Length	Area

Perimeter = 18 units		
Number of rectangles you made: _____		
Width	Length	Area

Perimeter = 20 units		
Number of rectangles you made: _____		
Width	Length	Area

Name _____   Date _____

1. On your centimeter grid paper, shade and label as many rectangles as you can with a perimeter of 16 centimeters.

    a. Sketch the rectangles below, and label the side lengths.

    b. Find the area of each rectangle you drew above.

2. On your centimeter grid paper, shade and label as many rectangles as you can with a perimeter of 18 centimeters.

    a. Sketch the rectangles below, and label the side lengths.

    b. Find the area of each rectangle you drew above.

Lesson 21: Construct rectangles with a given perimeter using unit squares and determine their areas.

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3. Use centimeter grid paper to shade in as many rectangles as you can with the given perimeters.

a. Use the charts below to show how many rectangles you shaded for each given perimeter. You might not use all the spaces in the charts.

Perimeter = 10 cm		
Number of rectangles I made: _____		
Width	Length	Area
1 cm	4 cm	4 square cm

Perimeter = 20 cm		
Number of rectangles I made: _____		
Width	Length	Area
1 cm	9 cm	9 square cm

b. Did you make a square with either of the given perimeters? How do you know?

4. Macy and Gavin both draw rectangles with perimeters of 16 centimeters. Use words and pictures to explain how it is possible for Macy's and Gavin's rectangles to have the same perimeters but different areas.

Lesson 21: Construct rectangles with a given perimeter using unit squares and determine their areas.

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Name _____   Date _____

1. Margo finds as many rectangles as she can with a perimeter of 14 centimeters.

    a. Shade Margo's rectangles on the grid below. Label the length and width of each rectangle.
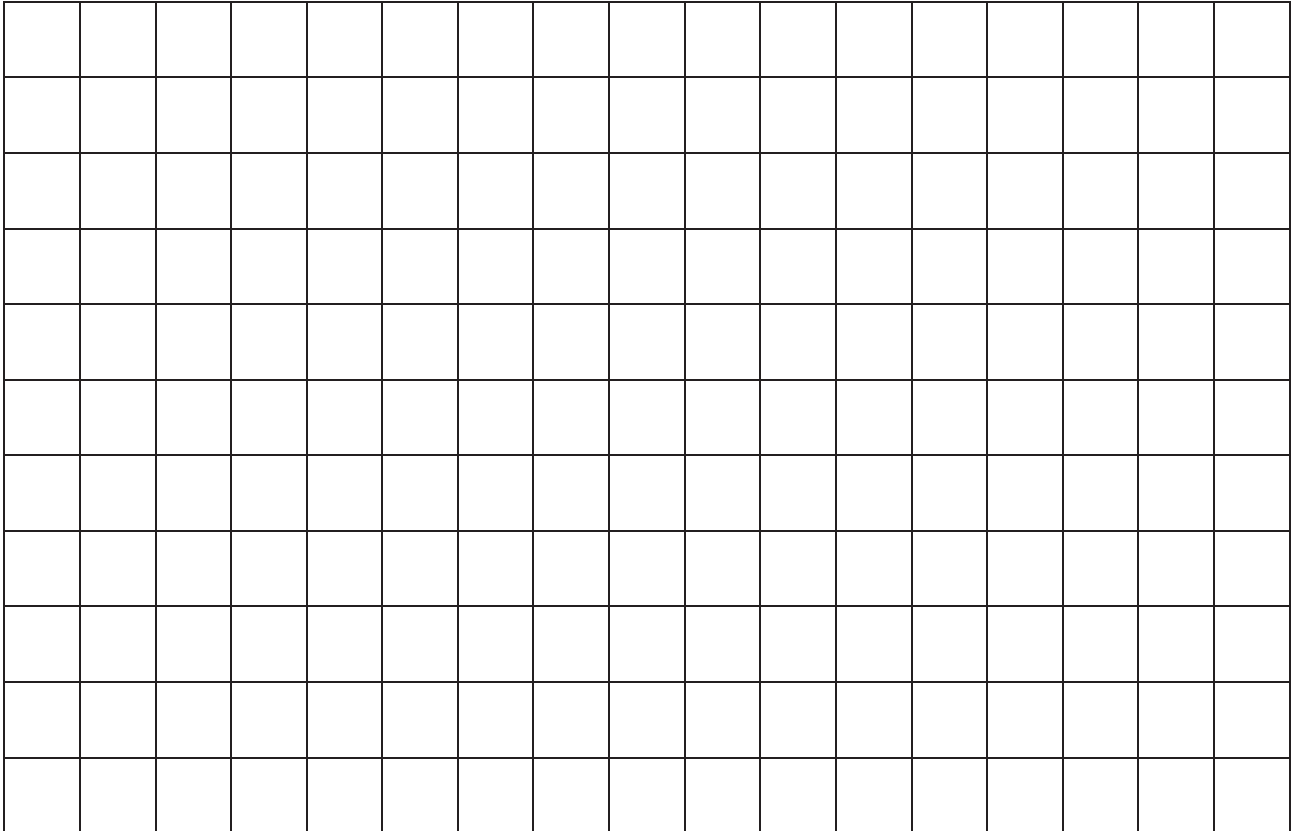
    b. Find the areas of the rectangles in part (a) above.

    c. The perimeters of the rectangles are the same. What do you notice about the areas?

Lesson 21:   Construct rectangles with a given perimeter using unit squares and determine their areas.

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2. Tanner uses unit squares to build rectangles that have a perimeter of 18 units. He creates the chart below to record his findings.

   a. Complete Tanner's chart. You might not use all the spaces in the chart.

Perimeter = 18 units		
Number of rectangles I made: _____		
Width	Length	Area
1 unit	8 units	8 square units

   b. Explain how you found the widths and lengths in the chart above.

3. Jason and Dina both draw rectangles with perimeters of 12 centimeters, but their rectangles have different areas. Explain with words, pictures, and numbers how this is possible.

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Lesson 21:   Construct rectangles with a given perimeter using unit squares and determine their areas.

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centimeter grid paper

Lesson 21: Construct rectangles with a given perimeter using unit squares and determine their areas.

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Name _____   Date _____

Use the data you gathered from Problem Sets 20 and 21 to complete the charts to show how many rectangles you can create with a given perimeter. You might not use all the spaces in the charts.

Perimeter = 10 units

Number of rectangles you made: _____

Width	Length	Area
1 unit	4 units	4 square units

Perimeter = 12 units

Number of rectangles you made: _____

Width	Length	Area

Perimeter = 14 units

Number of rectangles you made: _____

Width	Length	Area

Perimeter = 16 units

Number of rectangles you made: _____

Width	Length	Area

Perimeter = 18 units

Number of rectangles you made: _____

Width	Length	Area

Perimeter = 20 units

Number of rectangles you made: _____

Width	Length	Area

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Lesson 21:   Construct rectangles with a given perimeter using unit squares and determine their areas.

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Name _____   Date _____

1. Use the data you gathered from your Problem Sets to create a line plot for the number of rectangles you created with each given perimeter.

Number of Rectangles Made with a Given Perimeter

Perimeter Measurements in Units | **X = 1 Rectangle** |
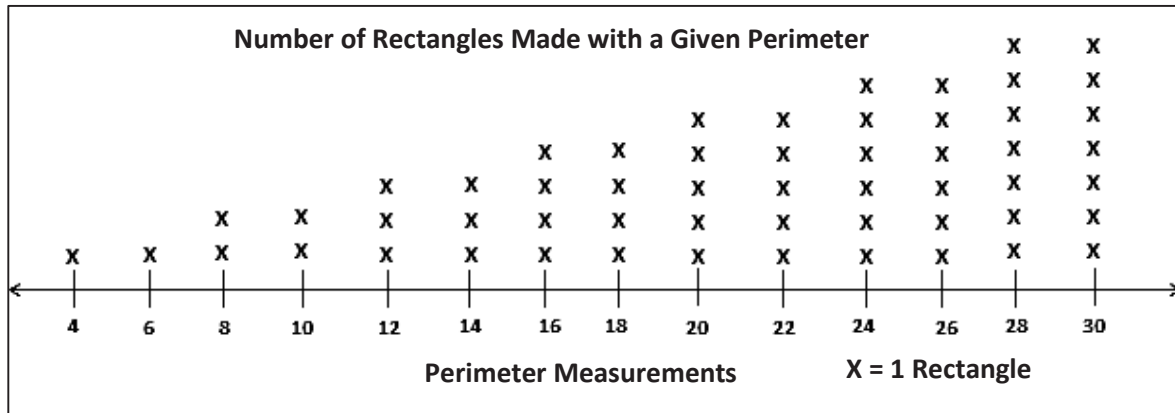
2. Why are all of the perimeter measurements even? Do all rectangles have an even perimeter?

Lesson 22:   Use a line plot to record the number of rectangles constructed in Lessons 20 and 21.

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3. Compare the two line plots we created. Is there any reason to think that knowing only the area of a rectangle would help you to figure out its perimeter or knowing only the perimeter of a rectangle would help you figure out its area?

4. Sumi uses unit square tiles to build 3 rectangles that have an area of 32 square units. Does knowing this help her find the number of rectangles she can build for a perimeter of 32 units? Why or why not?

5. George draws 3 rectangles that have a perimeter of 14 centimeters. Alicia tells George that there are more than 3 rectangles that have a perimeter of 14 centimeters. Explain why Alicia is correct.

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Lesson 22:   Use a line plot to record the number of rectangles constructed in
Lessons 20 and 21.

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Name _____   Date _____

1. The following line plot shows the number of rectangles a student made using square unit tiles. Use the line plot to answer the questions below.

Number of Rectangles Made with a Given Perimeter

Perimeter Measurements   X = 1 Rectangle

a. Why are all of the perimeter measurements even? Do all rectangles have even perimeters?

b. Explain the pattern in the line plot. What types of side lengths make this pattern possible?

c. How many X's would you draw for a perimeter of 32? Explain how you know.

Lesson 22:   Use a line plot to record the number of rectangles constructed in Lessons 20 and 21.

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2. Luis uses square inch tiles to build a rectangle with a perimeter of 24 inches. Does knowing this help him find the number of rectangles he can build with an area of 24 square inches? Why or why not?

3. Esperanza makes a rectangle with a piece of string. She says the perimeter of her rectangle is 33 centimeters. Explain how it's possible for her rectangle to have an odd perimeter.

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Lesson 22:   Use a line plot to record the number of rectangles constructed in Lessons 20 and 21.

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Name _____ Date _____

1. Gale makes a miniature stop sign, a regular octagon, with a perimeter of 48 centimeters for the town he built with blocks. What is the length of each side of the stop sign?

2. Travis bends wire to make rectangles. Each rectangle measures 34 inches by 12 inches. What is the total length of the wire needed for two rectangles?

3. The perimeter of a rectangular bathroom is 32 feet. The width of the room is 8 feet. What is the length of the room?

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4. Raj uses 6-inch square tiles to make a rectangle, as shown below. What is the perimeter of the rectangle in inches?

6 in
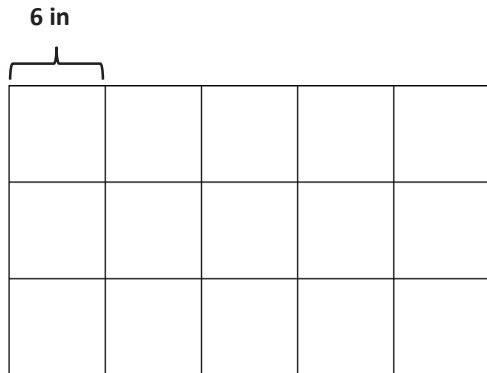
5. Mischa makes a 4-foot by 6-foot rectangular banner. She puts ribbon around the outside edges. The ribbon costs $2 per foot. What is the total cost of the ribbon?

6. Colton buys a roll of wire fencing that is 120 yards long. He uses it to fence in his 18-yard by 24-yard rectangular garden. Will Colton have enough wire fencing left over to fence in a 6-yard by 8-yard rectangular play space for his pet rabbit?

Name _____   Date _____

1. Rosie draws a square with a perimeter of 36 inches. What are the side lengths of the square?

2. Judith uses craft sticks to make two 24-inch by 12-inch rectangles. What is the total perimeter of the 2 rectangles?

3. An architect draws a square and a rectangle, as shown below, to represent a house that has a garage. What is the total perimeter of the house with its attached garage?
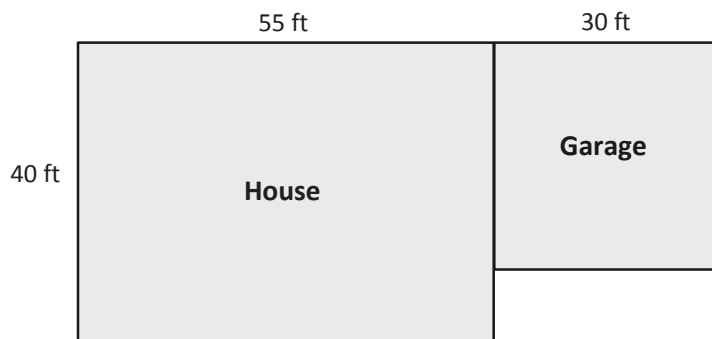
4. Manny draws 3 regular pentagons to create the shape shown below. The perimeter of 1 of the pentagons is 45 inches. What is the perimeter of Manny's new shape?
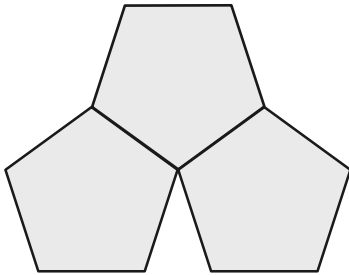
5. Johnny uses 2-inch square tiles to make a square, as shown below. What is the perimeter of Johnny's square?

2 in
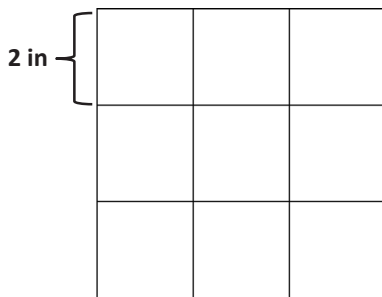
6. Lisa tapes three 7-inch by 9-inch pieces of construction paper together to make a happy birthday sign for her mom. She uses a piece of ribbon that is 144 inches long to make a border around the outside edges of the sign. How much ribbon is leftover?

9 in

7 in

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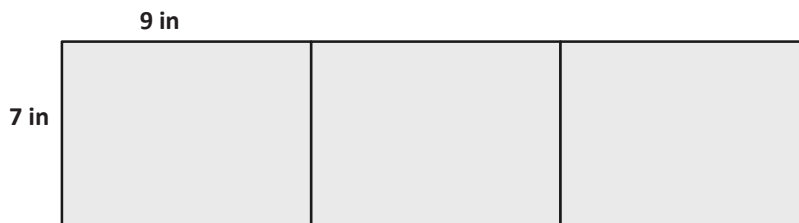
Name _____   Date _____

Use the given perimeters in the chart below to choose the widths and lengths of your robot's rectangular body parts. Write the widths and lengths in the chart below. Use the blank rows if you want to add extra rectangular body parts to your robot.

Letter	Body Part	Perimeter	Width and Length
A	arm	14 cm	_____ cm by _____ cm
B	arm	14 cm	_____ cm by _____ cm
C	leg	18 cm	_____ cm by _____ cm
D	leg	18 cm	_____ cm by _____ cm
E	body	Double the perimeter of one arm = _____ cm	_____ cm by _____ cm
F	head	16 cm	_____ cm by _____ cm
G	neck	Half the perimeter of the head = _____ cm	_____ cm by _____ cm
H			_____ cm by _____ cm
I			_____ cm by _____ cm
My robot has 7 to 9 rectangular body parts. Number of body parts: _____			

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Lesson 24:   Use rectangles to draw a robot with specified perimeter measurements, and reason about the different areas that may be produced.

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Use the information in the chart below to plan an environment for your robot. Write the width and length for each rectangular item. Use the blank rows if you want to add extra circular or rectangular items to your robot's environment.

Letter	Item	Shape	Perimeter	Width and Length
J	sun	circle	about 25 cm	
K	house	rectangle	82 cm	_____ cm by _____cm
L	tree top	circle	about 30 cm	
M	tree trunk	rectangle	30 cm	_____ cm by _____cm
N	tree top	circle	about 20 cm	
O	tree trunk	rectangle	20 cm	_____ cm by _____cm
P				
Q				
My robot's environment has 6 to 8 items. Number of items: _____				

Lesson 24: Use rectangles to draw a robot with specified perimeter measurements, and reason about the different areas that may be produced.

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Name _____ Date _____

1. Brian draws a square with a perimeter of 24 inches. What is the width and length of the square?

2. A rectangle has a perimeter of 18 centimeters.

   a. Estimate to draw as many different rectangles as you can that have a perimeter of 18 centimeters. Label the width and length of each rectangle.

   b. How many different rectangles did you find?

   c. Explain the strategy you used to find the rectangles.

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Lesson 24: Use rectangles to draw a robot with specified perimeter measurements, and reason about the different areas that may be produced.

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3. The chart below shows the perimeters of three rectangles.

   a. Write possible widths and lengths for each given perimeter.

Rectangle	Perimeter	Width and Length
A	6 cm	_____ cm by _____ cm
B	10 cm	_____ cm by _____ cm
C	14 cm	_____ cm by _____ cm
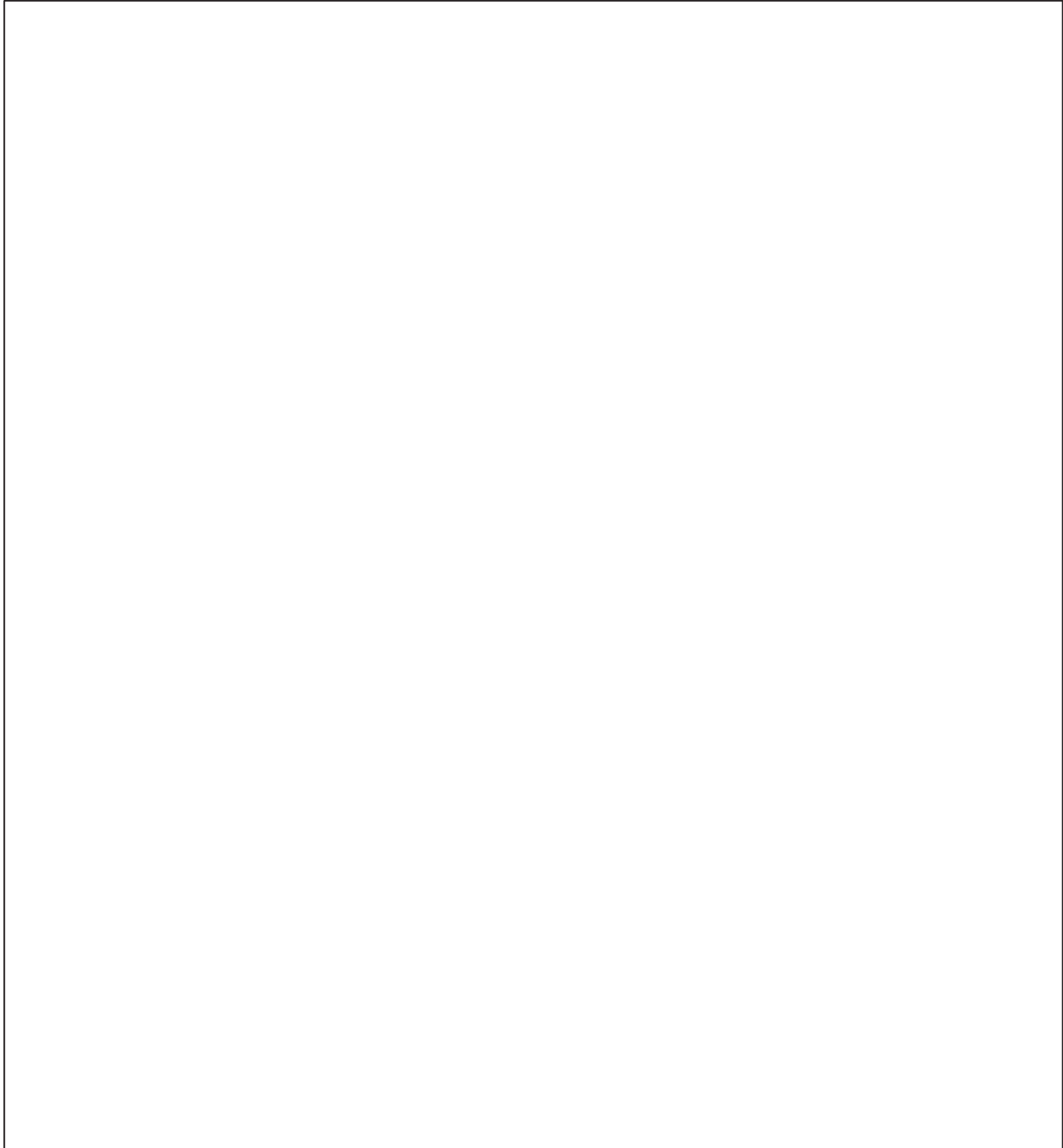
   b. Double the perimeters of the rectangles in part (a). Then, find possible widths and lengths.

Rectangle	Perimeter	Width and Length
A	12 cm	_____ cm by _____ cm
B		_____ cm by _____ cm
C		_____ cm by _____ cm

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Lesson 24: Use rectangles to draw a robot with specified perimeter measurements, and reason about the different areas that may be produced.

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Name _____   Date _____

Draw a picture of your robot in its environment in the space below. Label the widths, lengths, and perimeters of all rectangles. Label the perimeters of all circular shapes.

Lesson 25: Use rectangles to draw a robot with specified perimeter measurements, and reason about the different areas that may be produced.

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Name _____   Date _____

The robot below is made of rectangles. The side lengths of each rectangle are labeled. Find the perimeter of each rectangle, and record it in the table on the next page.

4 cm

4 cm   **A**

2 cm
2 cm   **B**

5 cm   5 cm

2 cm   **D**   **E**   2 cm

8 cm   **C**

6 cm

7 cm   **F**   **G**   7 cm

2 cm   2 cm

Lesson 25:   Use rectangles to draw a robot with specified perimeter measurements, and reason about the different areas that may be produced.

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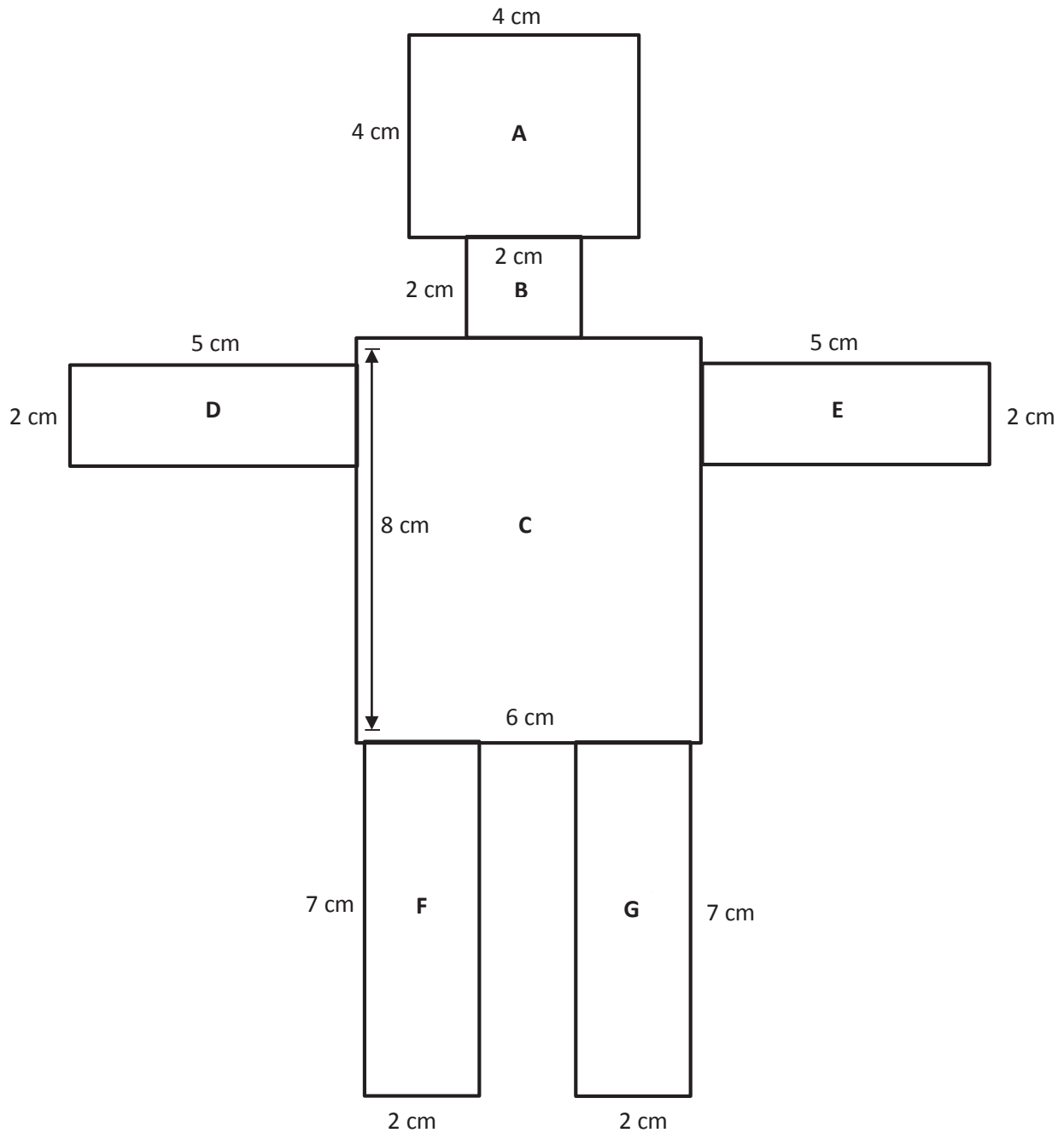
Rectangle	Perimeter
A	P = 4 × 4 cm P = 16 cm
B	
C	
D	
E	
F	
G	

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Lesson 25: Use rectangles to draw a robot with specified perimeter measurements, and reason about the different areas that may be produced.

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Name _____   Date _____

1. Collect the area measurements of your classmates' **robot bodies**. Make a line plot using everyone's area measurements.

Areas of Robot Bodies

Area Measurements of the Robot's Body in
Square Centimeters

X = 1 Robot Body

a. How many different measurements are on the line plot? Why are the measurements different?

b. What does this tell you about the relationship between area and perimeter?

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Lesson 26:   Use rectangles to draw a robot with specified perimeter
measurements, and reason about the different areas that may be
produced.

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2. Measure and calculate the perimeter of your construction paper in inches. Show your work below.

3. Sketch and label two shapes with the same perimeter from the robot's environment. What do you notice about the way they look?

4. Write two or three sentences describing your robot and the environment in which it lives.

Lesson 26:   Use rectangles to draw a robot with specified perimeter measurements, and reason about the different areas that may be produced.

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Name _____ Date _____

1. Use Rectangles A and B to answer the questions below.

4 cm

4 cm | **Rectangle A**

5 cm
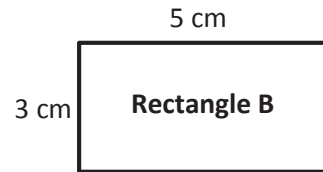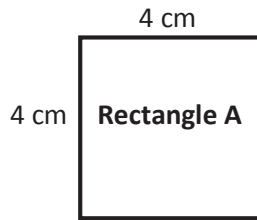
3 cm | **Rectangle B**

a. What is the perimeter of Rectangle A?

b. What is the perimeter of Rectangle B?

c. What is the area of Rectangle A?

d. What is the area of Rectangle B?

e. Use your answers to parts (a–d) to help you explain the relationship between area and perimeter.

Lesson 26: Use rectangles to draw a robot with specified perimeter measurements, and reason about the different areas that may be produced.

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2. Each student in Mrs. Dutra's class draws a rectangle with whole number side lengths and a perimeter of 28 centimeters. Then, they find the area of each rectangle and create the table below.

Area in Square Centimeters	Number of Students
13	2
24	1
33	3
40	5
45	4
48	2
49	2

a. Give two examples from Mrs. Dutra's class to show how it is possible to have different areas for rectangles that have the same perimeter.

b. Did any students in Mrs. Dutra's class draw a square? Explain how you know.

c. What are the side lengths of the rectangle that most students in Mrs. Dutra's class made with a perimeter of 28 centimeters?

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Lesson 26: Use rectangles to draw a robot with specified perimeter measurements, and reason about the different areas that may be produced.

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Name _____ Date _____

Part A: I reviewed _____'s robot.

1. Use the chart below to evaluate your friend's robot. Measure the width and length of each rectangle. Then, calculate the perimeter. Record that information in the chart below. If your measurements differ from those listed on the project, put a star by the letter of the rectangle.

Rectangle	Width and Length	Student's Perimeter	Required Perimeter
A	_____ cm by _____cm		14 cm
B	_____ cm by _____cm		14 cm
C	_____ cm by _____cm		18 cm
D	_____ cm by _____cm		18 cm
E	_____ cm by _____cm		28 cm
F	_____ cm by _____cm		16 cm
G	_____ cm by _____cm		8 cm
H	_____ cm by _____cm		
I	_____ cm by _____cm		

![EUREKA MATH™]

Lesson 27: Use rectangles to draw a robot with specified perimeter measurements, and reason about the different areas that may be produced.

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2.   Is the perimeter of the robot's body double that of the arm? Show calculations below.

3.   Is the perimeter of the robot's neck half the perimeter of the head? Show calculations below.

Lesson 27:   Use rectangles to draw a robot with specified perimeter   **111**
measurements, and reason about the different areas that may be
produced.

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Part B: I reviewed _____'s robot environment.

4. Use the chart below to evaluate your friend's robot environment. Measure the width and length of each rectangle. Then, calculate the perimeter. Use your string to measure the perimeters of nonrectangular items. Record that information in the chart below. If your measurements differ from those listed on the project, put a star by the letter of the shape.

Item	Width and Length	Student's Perimeter	Required Perimeter
J			About 25 cm
K	_____ cm by _____ cm		82 cm
L			About 30 cm
M	_____ cm by _____ cm		30 cm
N			About 20 cm
O	_____ cm by _____ cm		20 cm
P			
Q			

Lesson 27: Use rectangles to draw a robot with specified perimeter measurements, and reason about the different areas that may be produced.

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Name _____   Date _____

Record the perimeters and areas of the rectangles in the chart on the next page.

6 cm

6 cm   **A**

8 cm

4 cm   **B**

1 cm

C

11 cm

5 cm

5 cm   **D**

8 cm

2 cm   **E**

6 cm

4 cm   **F**

Lesson 27:   Use rectangles to draw a robot with specified perimeter measurements, and reason about the different areas that may be produced.

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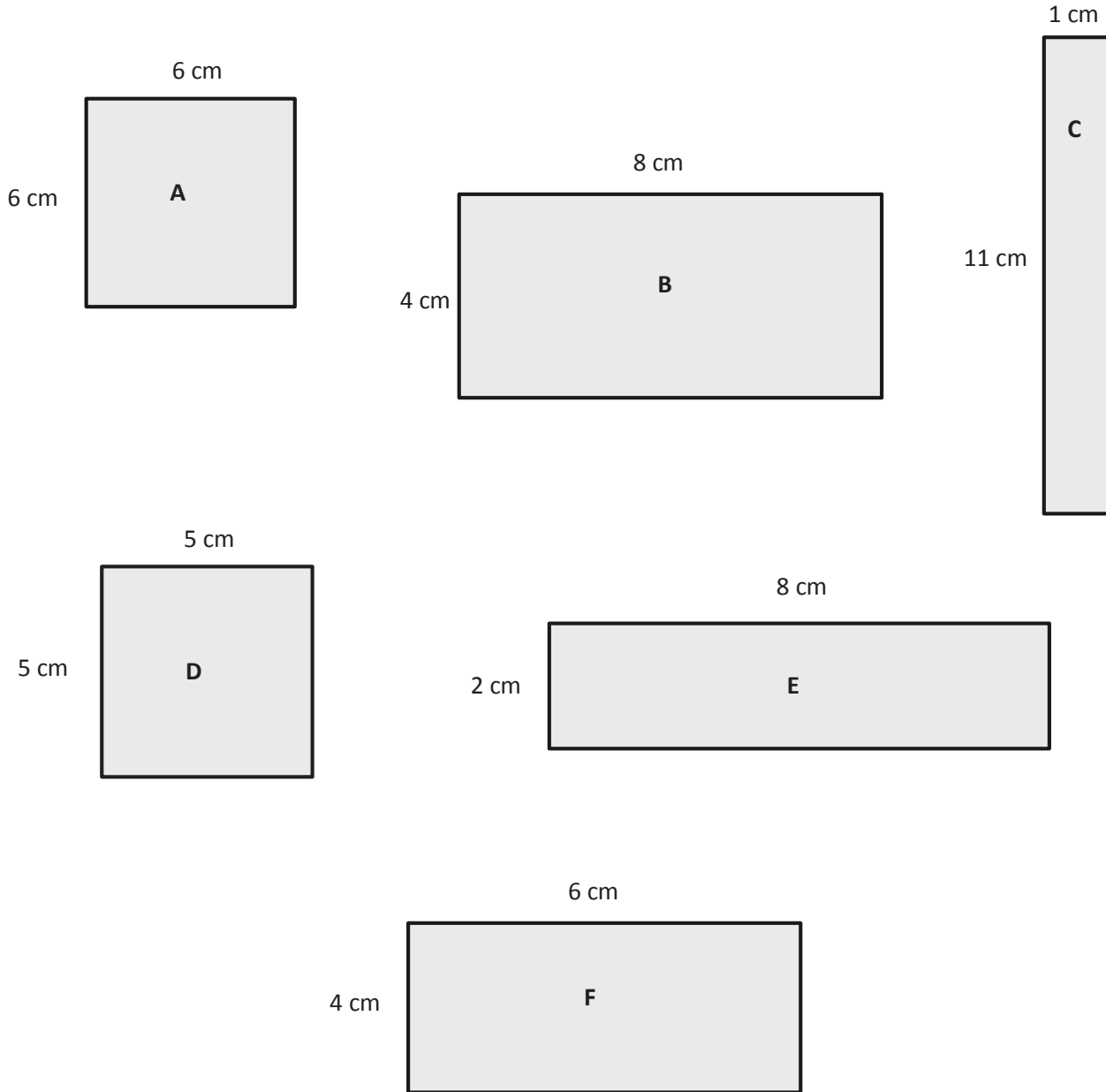
1. Find the area and perimeter of each rectangle.

Rectangle	Width and Length	Perimeter	Area
A	_____ cm by _____cm		
B	_____ cm by _____cm		
C	_____ cm by _____cm		
D	_____ cm by _____cm		
E	_____ cm by _____cm		
F	_____ cm by _____cm		

2. What do you notice about the perimeters of Rectangles A, B, and C?

3. What do you notice about the perimeters of Rectangles D, E, and F?

4. Which two rectangles are squares? Which square has the greater perimeter?

Lesson 27: Use rectangles to draw a robot with specified perimeter measurements, and reason about the different areas that may be produced.

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Name ___Sample_____   Date _____

Part A: I reviewed ___Student A___ 's robot.

Use the chart below to evaluate your friend's robot. Measure the lengths and widths of each rectangle. Then calculate the perimeter. Record that information in the table below. If your measurements differ from those listed on the project, put a star by the letter of the rectangle.

Rectangle	Width and Length	Student's Perimeter	Required Perimeter
A	___2___ cm by ___5___ cm	2cm + 2cm + 5cm + 5cm = 14cm	14 cm
B	___2___ cm by ___5___ cm		14 cm
C	___2___ cm by ___7___ cm		18 cm
D	___2___ cm by ___7___ cm		18 cm
E	___6___ cm by ___8___ cm		28 cm
F	___4___ cm by ___4___ cm		16 cm
G	___2___ cm by ___2___ cm		8 cm
H	_____ cm by _____ cm		
I	_____ cm by _____ cm		

sample Problem Set

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Lesson 27: Use rectangles to draw a robot with specified perimeter measurements, and reason about the different areas that may be produced.

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Name _____   Date _____

1. Gia measures her rectangular garden and finds the width is 9 yards and the length is 7 yards.

   a. Estimate to draw Gia's garden, and label the side lengths.

   b. What is the area of Gia's garden?

   c. What is the perimeter of Gia's garden?

2. Elijah draws a square that has side lengths of 8 centimeters.

   a. Estimate to draw Elijah's square, and label the side lengths.

   b. What is the area of Elijah's square?

   c. What is the perimeter of Elijah's square?

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Lesson 28:   Solve a variety of word problems involving area and perimeter using all four operations.

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d. Elijah connects three of these squares to make one long rectangle. What is the perimeter of this rectangle?

3. The area of Mason's rectangular painting is 72 square inches. The width of the painting is 8 inches.

   a. Estimate to draw Mason's painting, and label the side lengths.

   b. What is the length of the painting?

   c. What is the perimeter of Mason's painting?

   d. Mason's mom hangs the painting on a wall that already has two of Mason's other paintings. The areas of the other paintings are 64 square inches and 81 square inches. What is the total area of the wall that is covered with Mason's paintings?

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Lesson 28: Solve a variety of word problems involving area and perimeter using all four operations.

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4. The perimeter of Jillian's rectangular bedroom is 34 feet. The length of her bedroom is 9 feet.

   a. Estimate to draw Jillian's bedroom, and label the side lengths.

   b. What is the width of Jillian's bedroom?

   c. What is the area of Jillian's bedroom?

   d. Jillian has a 4-foot by 6-foot rug in her room. What is the area of the floor that is not covered by the rug?

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Lesson 28: Solve a variety of word problems involving area and perimeter using all four operations.

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Name _____   Date _____

1. Carl draws a square that has side lengths of 7 centimeters.

    a. Estimate to draw Carl's square, and label the side lengths.

    b. What is the area of Carl's square?

    c. What is the perimeter of Carl's square?

    d. Carl draws two of these squares to make one long rectangle. What is the perimeter of this rectangle?

Lesson 28: Solve a variety of word problems involving area and perimeter using all four operations.

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2. Mr. Briggs puts food for the class party on a rectangular table. The table has a perimeter of 18 feet and a width of 3 feet.

a. Estimate to draw the table, and label the side lengths.

b. What is the length of the table?

c. What is the area of the table?

d. Mr. Briggs puts three of these tables together side by side to make 1 long table. What is the area of the long table?

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Lesson 28: Solve a variety of word problems involving area and perimeter using all four operations.

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Name _____   Date _____

1. Kyle puts two rectangles together to make the L-shaped figure below. He measures some of the side lengths and records them as shown.

8 in

12 in

6 in

16 in
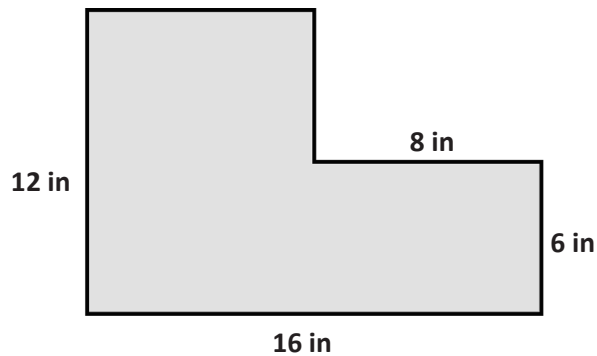
a. Find the perimeter of Kyle's shape.

b. Find the area of Kyle's shape.

c. Kyle makes two copies of the L-shaped figure to create the rectangle shown below. Find the perimeter of the rectangle.

12 in

16 in
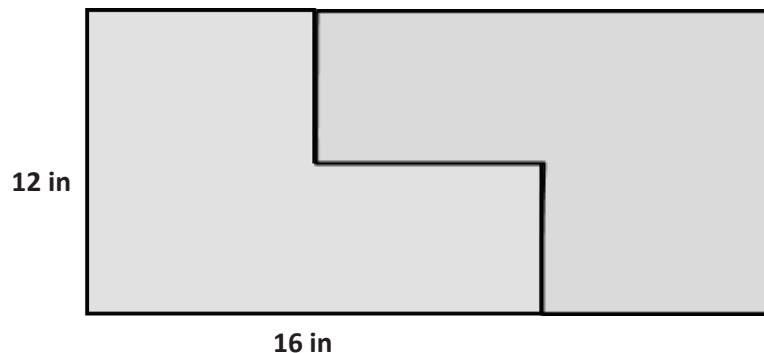
2. Jeremiah and Hayley use a piece of rope to mark a square space for their booth at the science fair. The area of their space is 49 square feet. What is the length of the rope that Jeremiah and Hayley use if they leave a 3-foot opening so they can get in and out of the space?

3. Vivienne draws four identical rectangles as shown below to make a new, larger rectangle. The perimeter of one of the small rectangles is 18 centimeters, and the width is 6 centimeters. What is the perimeter of the new, larger rectangle?
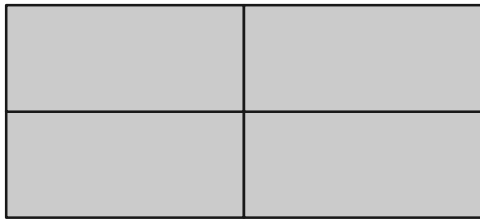
4. A jogging path around the outside edges of a rectangular playground measures 48 yards by 52 yards. Maya runs $3\frac{1}{2}$ laps on the jogging path. What is the total number of yards Maya runs?

Lesson 29: Solve a variety of word problems involving area and perimeter using al four operations.

122

Name _____ Date _____

1. Katherine puts two squares together to make the rectangle below. The side lengths of the squares measure 8 inches.

8 in

a. What is the perimeter of the rectangle Katherine made with her 2 squares?

b. What is the area of Katherine's rectangle?

c. Katherine decides to draw another rectangle of the same size. What is the area of the new, larger rectangle?

8 in

Lesson 29: Solve a variety of word problems involving area and perimeter using al four operations.

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2. Daryl draws 6 equal-sized rectangles as shown below to make a new, larger rectangle. The area of one of the small rectangles is 12 square centimeters, and the width of the small rectangle is 4 centimeters.

4cm
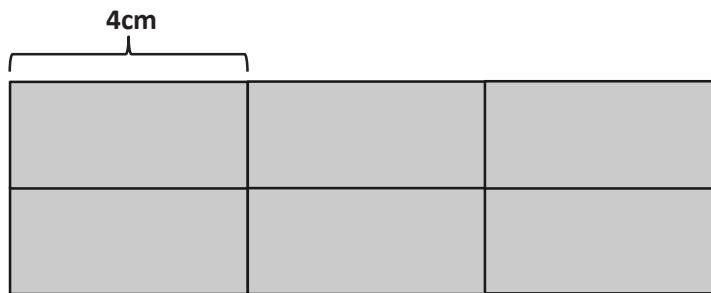
a. What is the perimeter of Daryl's new rectangle?

b. What is the area of Daryl's new rectangle?

3. The recreation center soccer field measures 35 yards by 65 yards. Chris dribbles the soccer ball around the perimeter of the field 4 times. What is the total number of yards Chris dribbles the ball?

EUREKA MATH™   **Lesson 29:**   Solve a variety of word problems involving area and perimeter using al   **124**
                                     four operations.

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Name _____   Date _____

Use this form to critique your classmate's problem-solving work.

Classmate:		Problem Number:	
Strategies My Classmate Used:			
Things My Classmate Did Well:			
Suggestions for Improvement:			
Strategies I Would Like to Try Based on My Classmate's Work:			

Name _____   Date _____

Use this form to critique Student A's problem-solving work on the next page.

Student:	Student A	Problem Number:	
Strategies Student A Used:			
Things Student A Did Well:			
Suggestions for Improvement:			
Strategies I Would Like to Try Based on Student A's Work:			

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Lesson 30: Share and critique peer strategies for problem solving.

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Name _____**STUDENT A**_____   Date _____

1. Katherine puts 2 squares together to make the rectangle below. The side lengths of the squares measure 8 inches.

8 in

a. What is the perimeter of Katherine's rectangle?

8in   8in
8in   8in
8in   8in
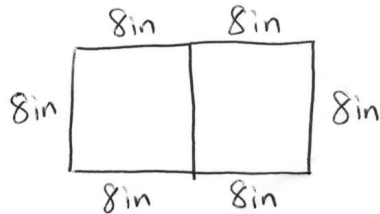
$P = 6 \times 8in$
$P = 48 in$
The perimeter is 48 inches.

b. What is the area of Katherine's rectangle?

10in   6 in
8in
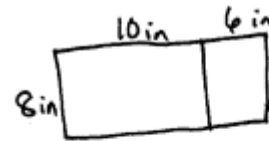
$A = (8 \times 10) + (8 \times 6)$
$A = 80 + 48$
$A = 128$
The area is 128 sq in.

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Lesson 30:   Share and critique peer strategies for problem solving.

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c.   Katherine draws 2 of the rectangles in Problem 1 side by side. Her new, larger rectangle is shown below. What is the area of the new, larger rectangle?

8 in

16 in

8 in | 128 sq in | 128 sq in

A = 128 sq in + 128 sq in
A = 256 sq in
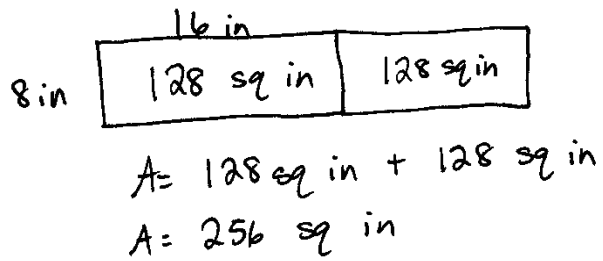
The area of the new rectangle is 256 sq in.

Student A

7 ft

$$7ft \boxed{\begin{matrix} A=49 \\ sq\,ft \end{matrix}}$$
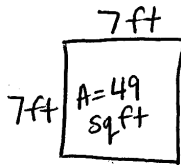
$P = 7ft + 7ft + 7ft + 7ft$
$P = 4 \times 7 ft$
$P = 28 ft$

$7 \times 7 = 49$

28ft

r ft

3ft
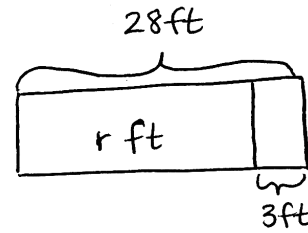
$r = 28 - 3$
$r = 25$
The total length of the rope is 25 feet.

Student B

7 ft

$$\boxed{\begin{matrix} A=49 \\ sq\,ft \end{matrix}} 7ft$$

7ft

7ft   7ft

4ft   3ft opening

The length of the rope is 25 feet.

$\underline{\quad} \times \underline{\quad} = 49$
$7 \times 7 = 49$
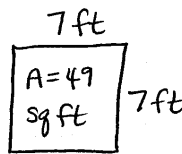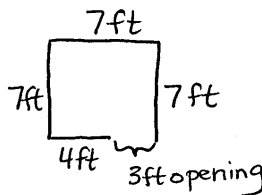
$7ft + 7ft + 7ft + 4ft$

$3 \times 7ft = 21ft$

$21 ft + 4ft$
$25 ft$

Student C

Area = 49 sq ft
Possible rectangles:

49 ft

1 ft

7 ft

7 ft

square

7 ft

7ft   7ft

7 ft
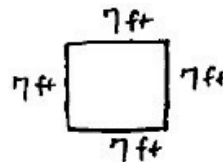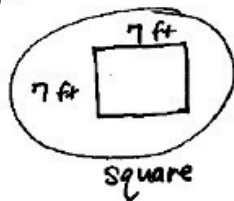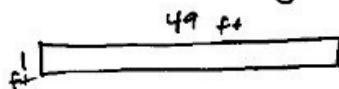
$P = 4 \times 7 ft$
$P = 28 ft$

$28 ft - 3 ft = 25 ft$
The length of the rope is 25 ft.

student work sample images

Name _____ Date _____

Use this form to analyze your classmate's representations of one-half shaded.

Square (letter)	Does this square show one-half shaded?	Explain why or why not.	Describe changes to make so the square shows one-half shaded.

Lesson 31: Explore and create unconventional representations of one-half.

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Name _____ Date _____

1. Use the rectangle below to answer Problem 1(a–d).
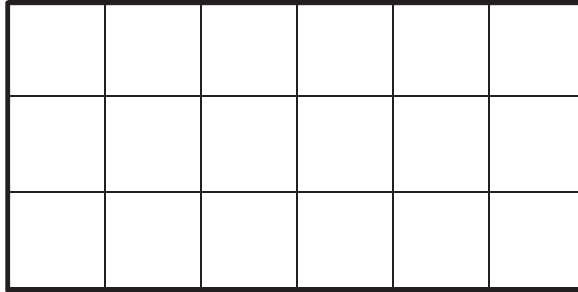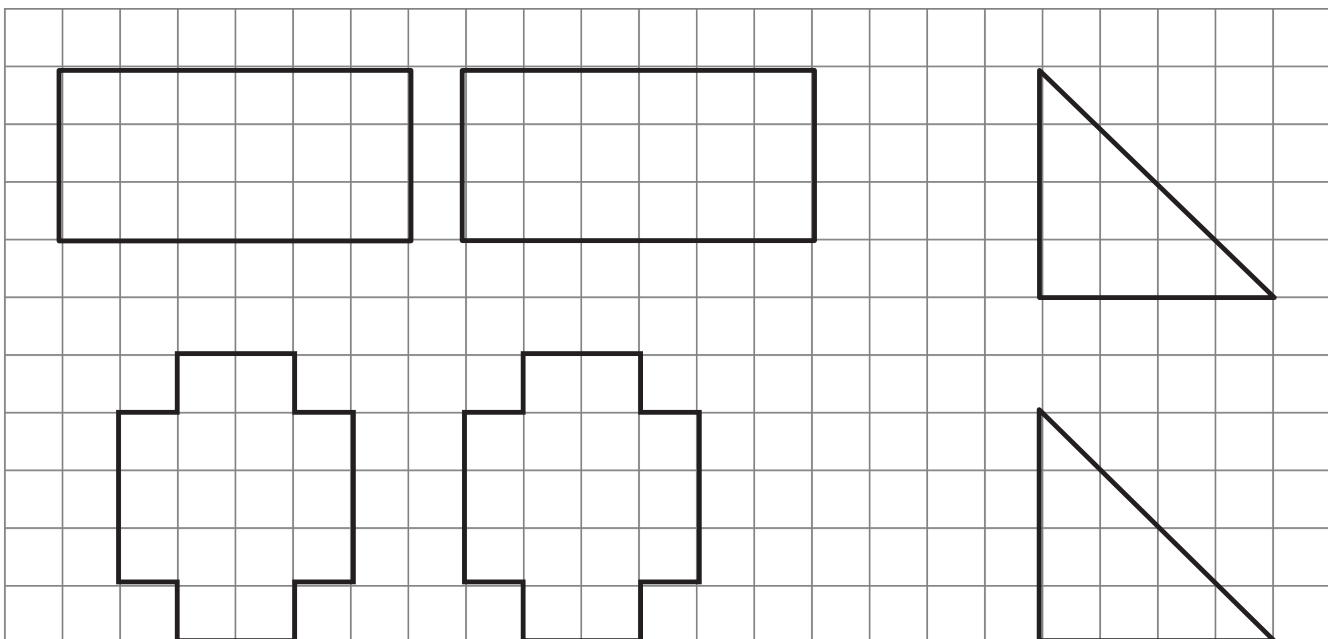
   a.   What is the area of the rectangle in square units?

   b.   What is the area of half of the rectangle in square units?

   c.   Shade in half of the rectangle above. Be creative with your shading!

   d.   Explain how you know you shaded in half of the rectangle.

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Lesson 31:   Explore and create unconventional representations of one-half.

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2. During math class, Arthur, Emily, and Gia draw a shape and then shade one-half of it. Analyze each student's work. Determine if each student was correct or not, and explain your thinking.

Student	Drawing	Your Analysis
Arthur		
Emily		
Gia		

3. Shade the grid below to show two different ways of shading half of each shape.

squares

Lesson 31: Explore and create unconventional representations of one-half.

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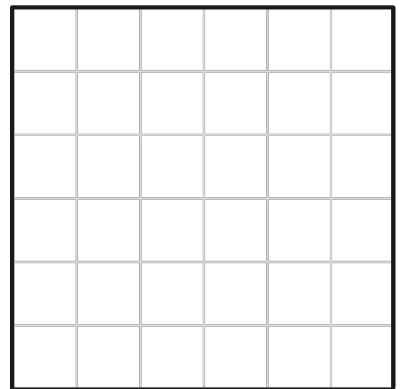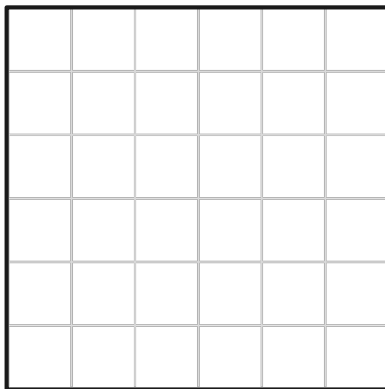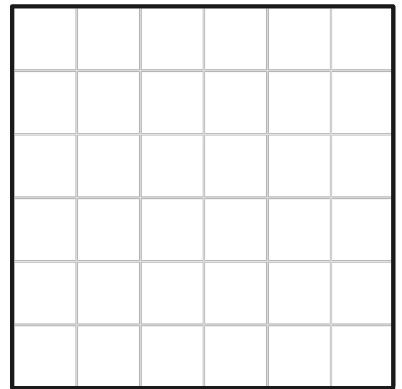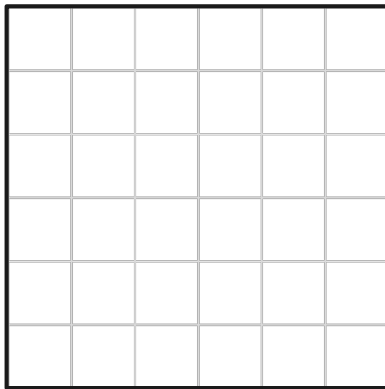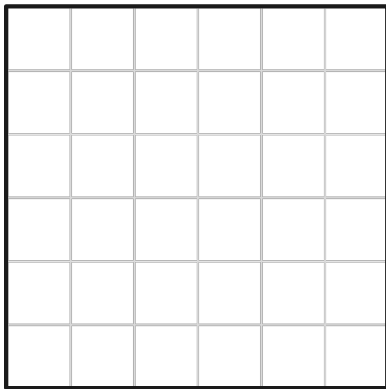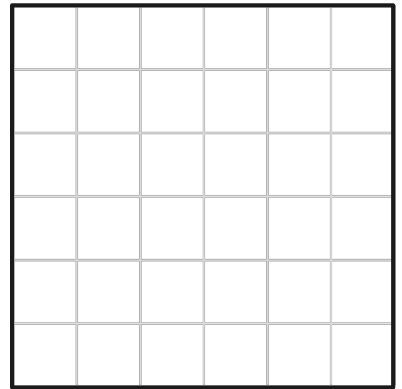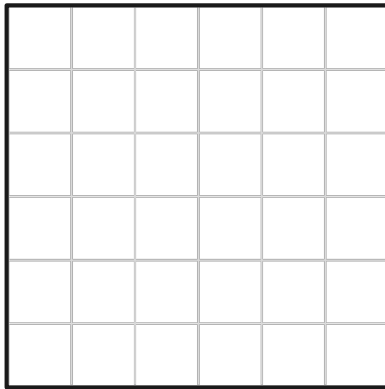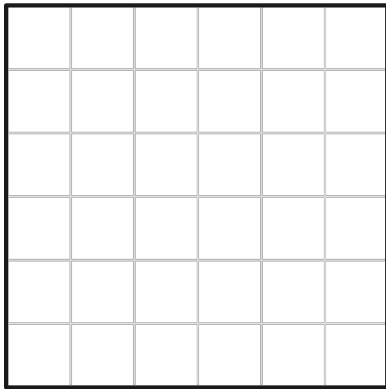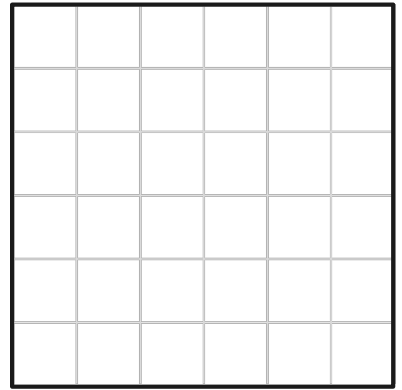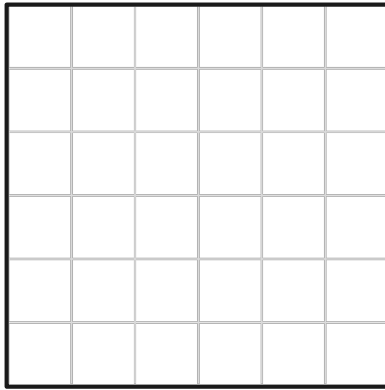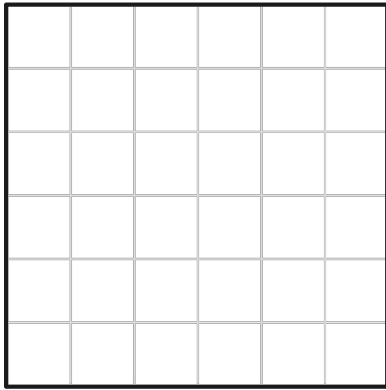
Name _____ Date _____

1. Look at the circles you shaded today. Glue a circle that is about one-half shaded in the space below.

    a. Explain the strategy you used to shade in one-half of your circle.

    b. Is your circle exactly one-half shaded? Explain your answer.

2. Julian shades 4 circles as shown below.
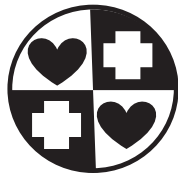
    Circle A   Circle B   Circle C   Circle D
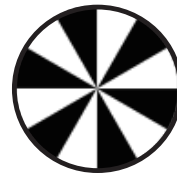
    a. Write the letters of the circles that are about one-half shaded.

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b. Choose one circle from your answer to Part (a), and explain how you know it's about one-half shaded.

Circle _____

c. Choose one circle that you did not list in Part (a), and explain how it could be changed so that it is about one-half shaded.

Circle _____

3. Read the clues to help you shade the circle below.
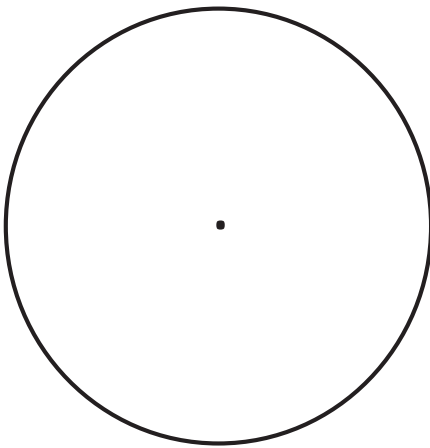
a. Divide the circle into 4 equal parts.

b. Shade in 2 parts.

c. Erase a small circle from each shaded part.

d. Estimate to draw and shade 2 circles in the unshaded parts that are the same size as the circles you erased in Part (c).

4. Did you shade in one-half of the circle in Problem 3? How do you know?

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Name _____   Date _____

1. Estimate to finish shading the circles below so that each circle is about one-half shaded.
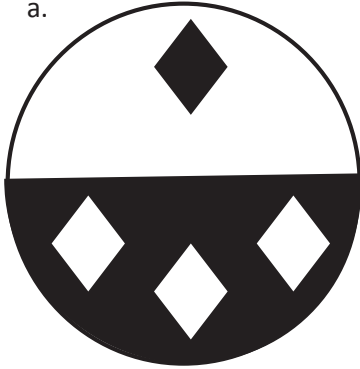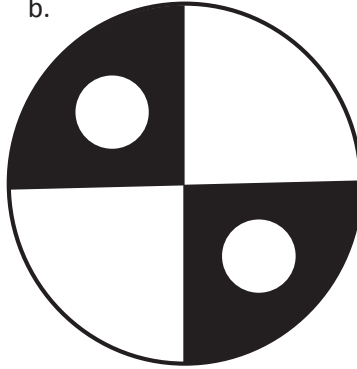
    a.   b.   c.
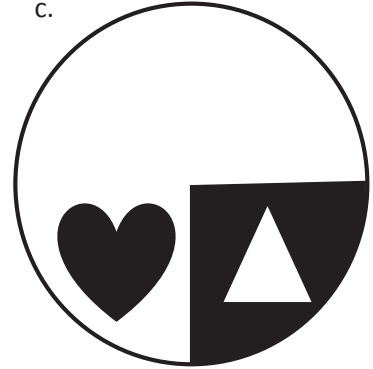
2. Choose one of the circles in Problem 1, and explain how you know it's about one-half shaded.

    Circle _____

3. Can you say the circles in Problem 1 are exactly one-half shaded? Why or why not?

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4. Marissa and Jake shade in circles as shown below.

Marissa's Circle
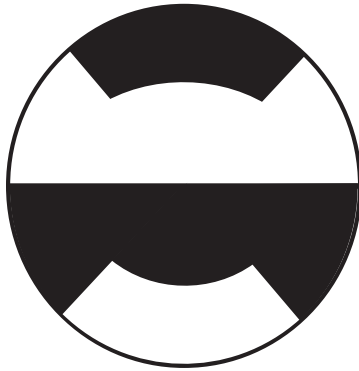
Jake's Circle
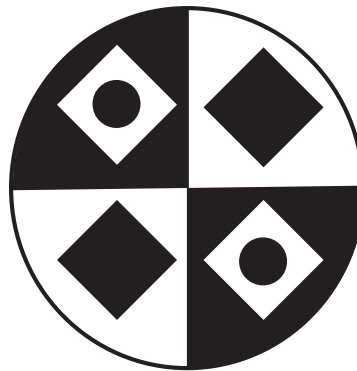
a. Whose circle is about one-half shaded? How do you know?

b. Explain how the circle that is not one-half shaded can be changed so that it is one-half shaded.

5. Estimate to shade about one-half of each circle below in an unusual way.

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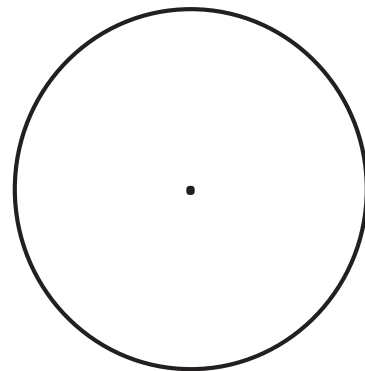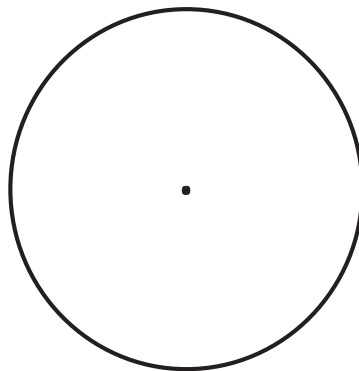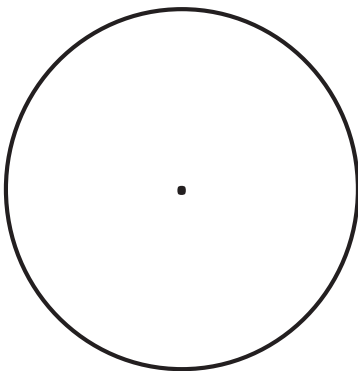
Name _____ Date _____

List some games we played today in the chart below. Place a check mark in the box that shows how you felt about your level of fluency as you played each activity. Check off the last column if you would like to practice this activity over the summer.

Activity	I still need some practice with my facts.	I am fluent.	I would like to put this in my summer activity book.
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			

Name _____ Date _____

Teach a family member your favorite fluency game from class. Record information about the game you taught below.

Name of the game: _____

_____

Materials used: _____

_____

Name of the person you taught to play: _____

Describe what it was like to teach the game. Was it easy? Hard? Why? _____

_____

_____

_____

Will you play the game together again? Why or why not? _____

_____

_____

Was the game as fun to play at home as in class? Why or why not? _____

_____

_____

Name _____   Date _____

Complete a math activity each day. To track your progress, color the box after you finish.

Summer Math Review: Weeks 1–5

	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1	Do jumping jacks as you count by twos from 2 to 20 and back.	Play a game from your Summer Practice booklet.	Use your tangram pieces to make a picture of your summer break.	Time how long it takes you to do a specific chore, like making the bed. See if you can do it faster the next day.	Complete a Sprint.
Week 2	Do squats as you count by threes from 3 to 30 and back.	Play a game from your Summer Practice booklet.	Collect data about your family's or friends' favorite type of music. Show it on a bar graph. What did you discover from your graph?	Read a recipe. What fractions does the recipe use?	Complete a Multiply by Pattern Sheet.
Week 3	Hop on one foot as you count by fours from 4 to 40 and back.	Create a multiplication and/or division math game. Then, play the game with a partner.	Measure the widths of different leaves from the same tree to the nearest quarter inch. Then, draw a line plot of your data. Do you notice a pattern?	Read the weight in grams of different food items in your kitchen. Round the weights to the nearest 10 or 100 grams.	Complete a Sprint.
Week 4	Bounce a ball as you count by 5 minutes to 1 hour and then to the half hour and quarter hours.	Find, draw, and/or create different objects to show one-fourth.	Go on a shape scavenger hunt. Find as many quadrilaterals in your neighborhood or house as you can.	Find the sum and difference of 453 mL and 379 mL.	Complete a Multiply by Pattern Sheet.
Week 5	Do arm swings as you count by sixes from 6 to 60 and back.	Draw and label a floor plan of your house.	Measure the perimeter of the room where you sleep in inches. Then, calculate the area.	Use a stopwatch to measure how fast you can run 50 meters. Do it 3 times. What was your fastest time?	Complete a Sprint.

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Lesson 34:   Create resource booklets to support fluency with Grade 3 skills.

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Name _____ Date _____

Complete a math activity each day. To track your progress, color the box after you finish.

Summer Math Review: Weeks 6–10

	Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**
Week 6	Alternate counting with a friend or family member by sevens from 7 to 70 and back.	Play a game from your Summer Practice booklet.	Write a story problem for 7 × 6.	Solve 15 × 4. Draw a model to show your thinking.	Complete a Multiply by Pattern Sheet.
Week 7	Jump forward and back as you count by eights from 8 to 80 and back.	Play a game from your Summer Practice booklet.	Use string to measure the perimeter of circular items in your house to the nearest quarter inch.	Build a 4 by 6 array with objects from your house. Write 2 multiplication and 2 division sentences for your array.	Complete a Sprint.
Week 8	Do arm crosses as you count by nines from 9 to 90 and back.

Teach someone the nines finger trick. | Create a multiplication and/or division math game. Then, play the game with a partner. | Write a story problem for 72 ÷ 8. | Measure or find the capacity in milliliters of different liquids in your kitchen. Round each to the nearest 10 or 100 milliliters. | Complete a Multiply by Pattern Sheet. |
| **Week 9** | Jump rope as you count up by tens from 280 to 370 and back down. | Find, draw, and/or create different objects to show one-third. | Go on a shape scavenger hunt. Find as many triangles and hexagons in your neighborhood as you can. | Measure the weight of different produce at the grocery store. What unit did you measure in? What are the lightest and heaviest objects you weighed? | Complete a Sprint. |
| **Week 10** | Count by sixes starting at 48. Count as high as you can in one minute. | Draw and label a floor plan of your dream tree house. | Find the perimeter of a different room in your house. How much smaller or larger is it compared to the perimeter of the room where you sleep? | Show someone your strategy to solve 8 × 16. | Complete a Multiply by Pattern Sheet. |

Cut Out Packet

A

B

C

E

F

G

H

D

I

J

K

L

polygons (A–L)

M

N

O

P

Q

R

polygons (M–X)

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S

T

W

U

X

V

polygons (M–X)

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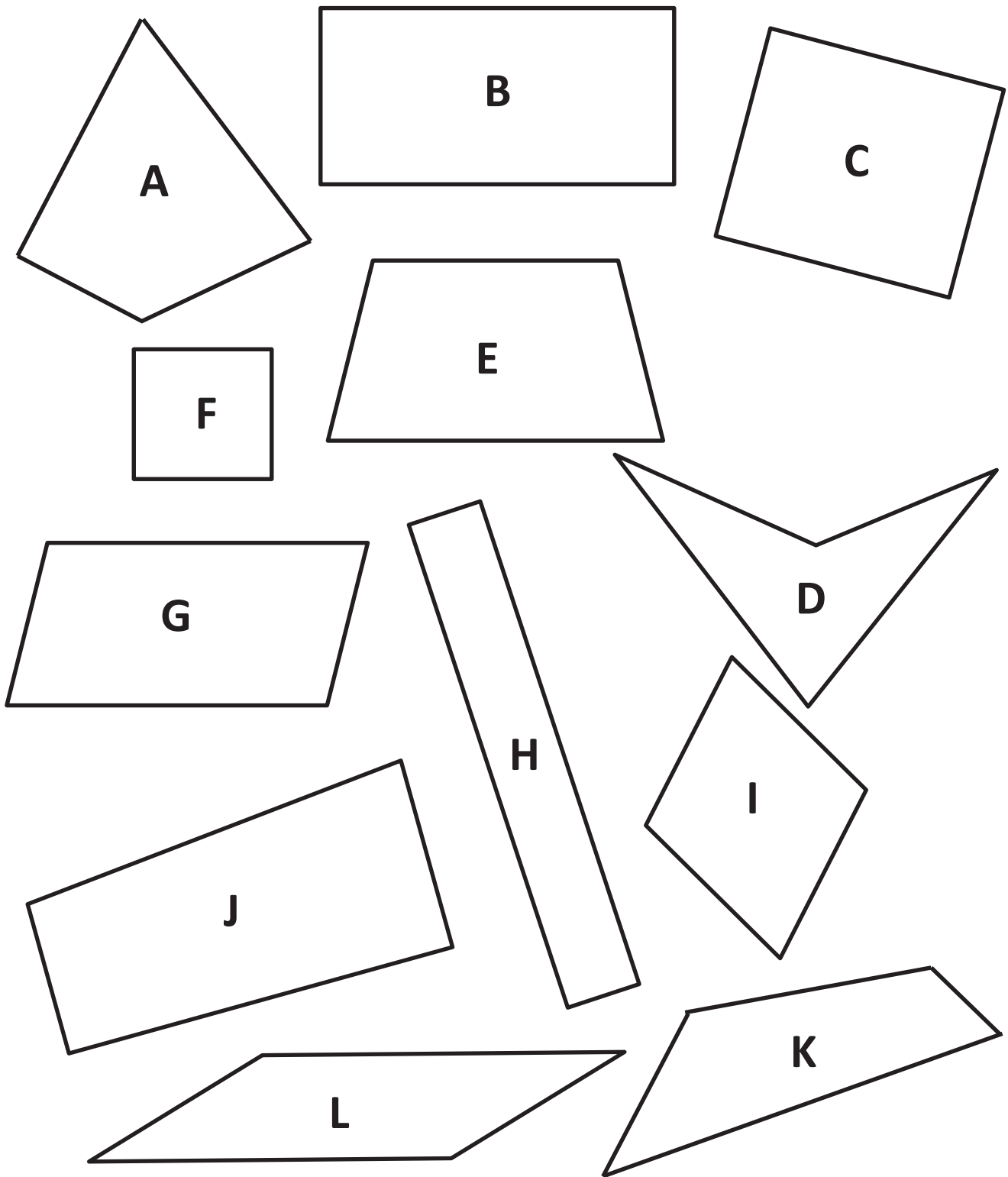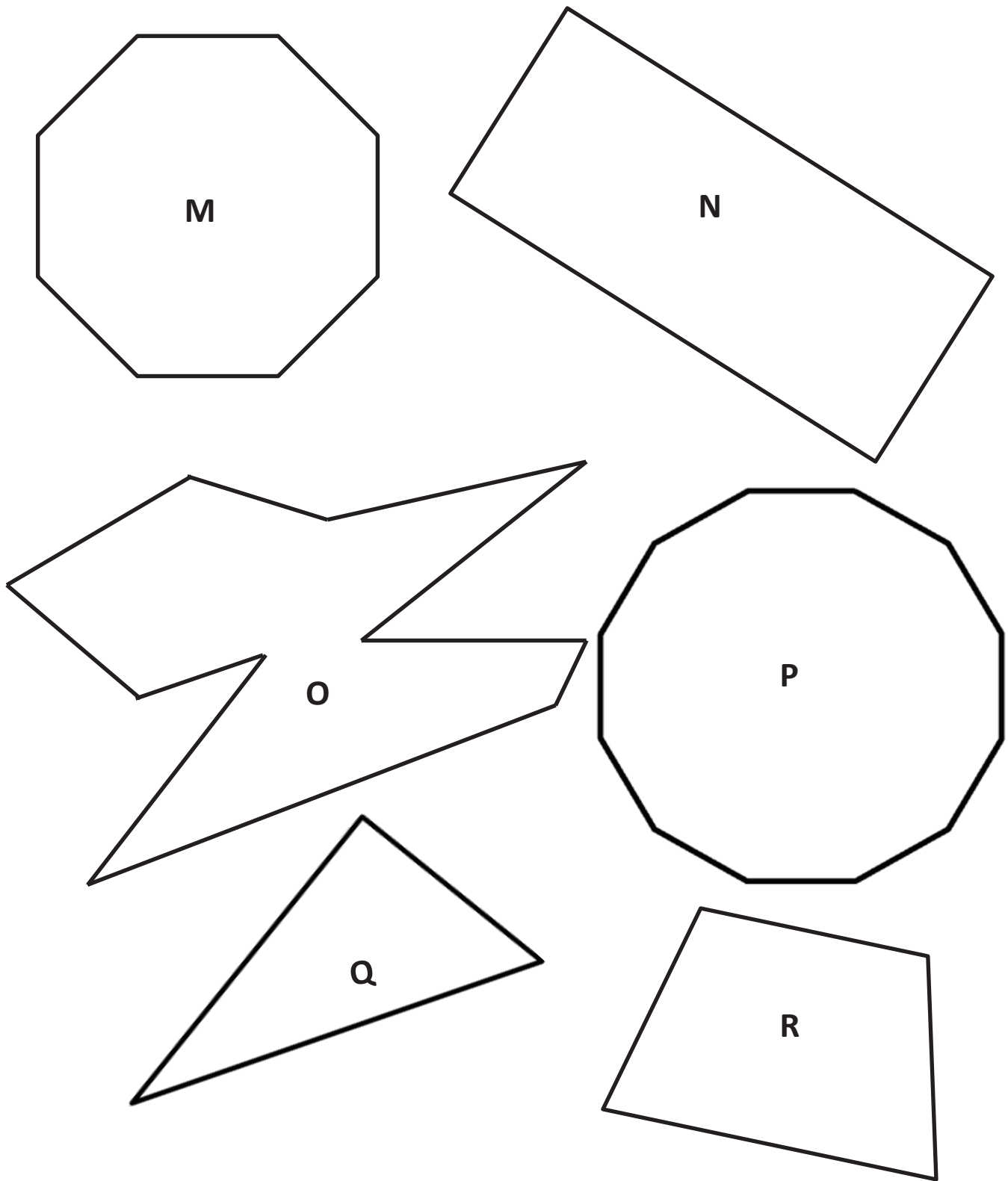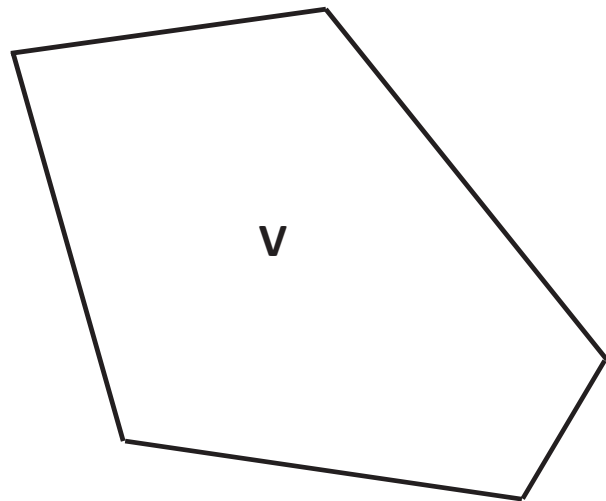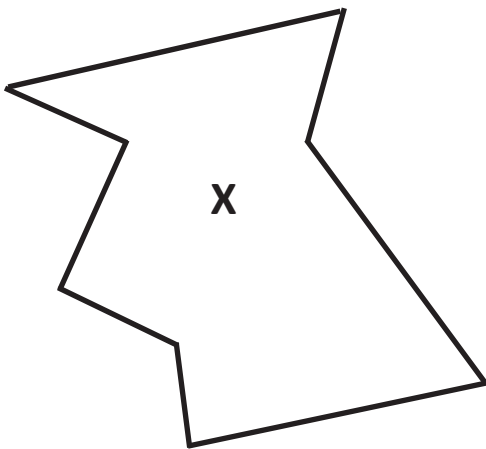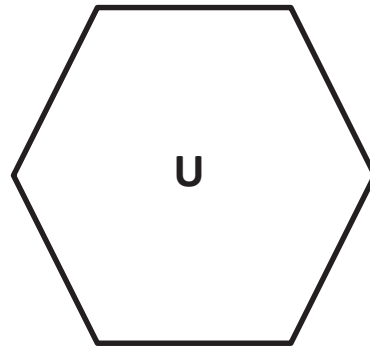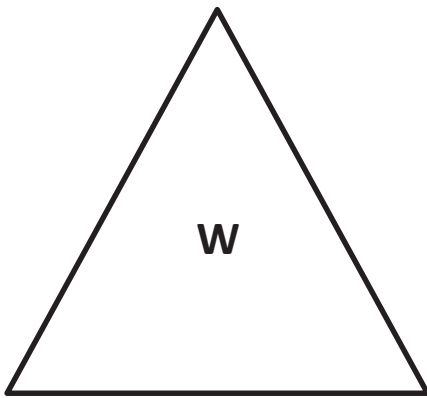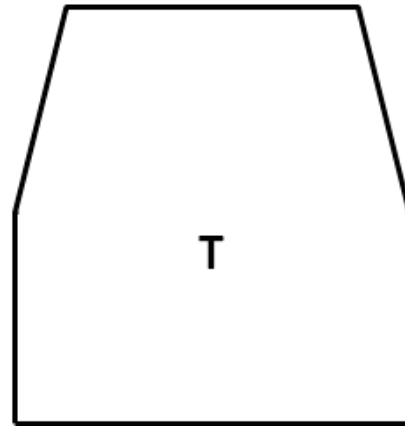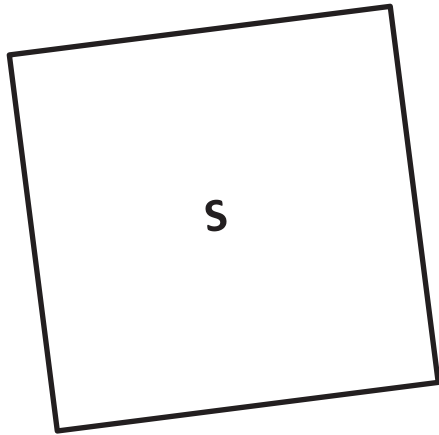
Note: Print on cardstock.

A

C

E

D

B

F

_____
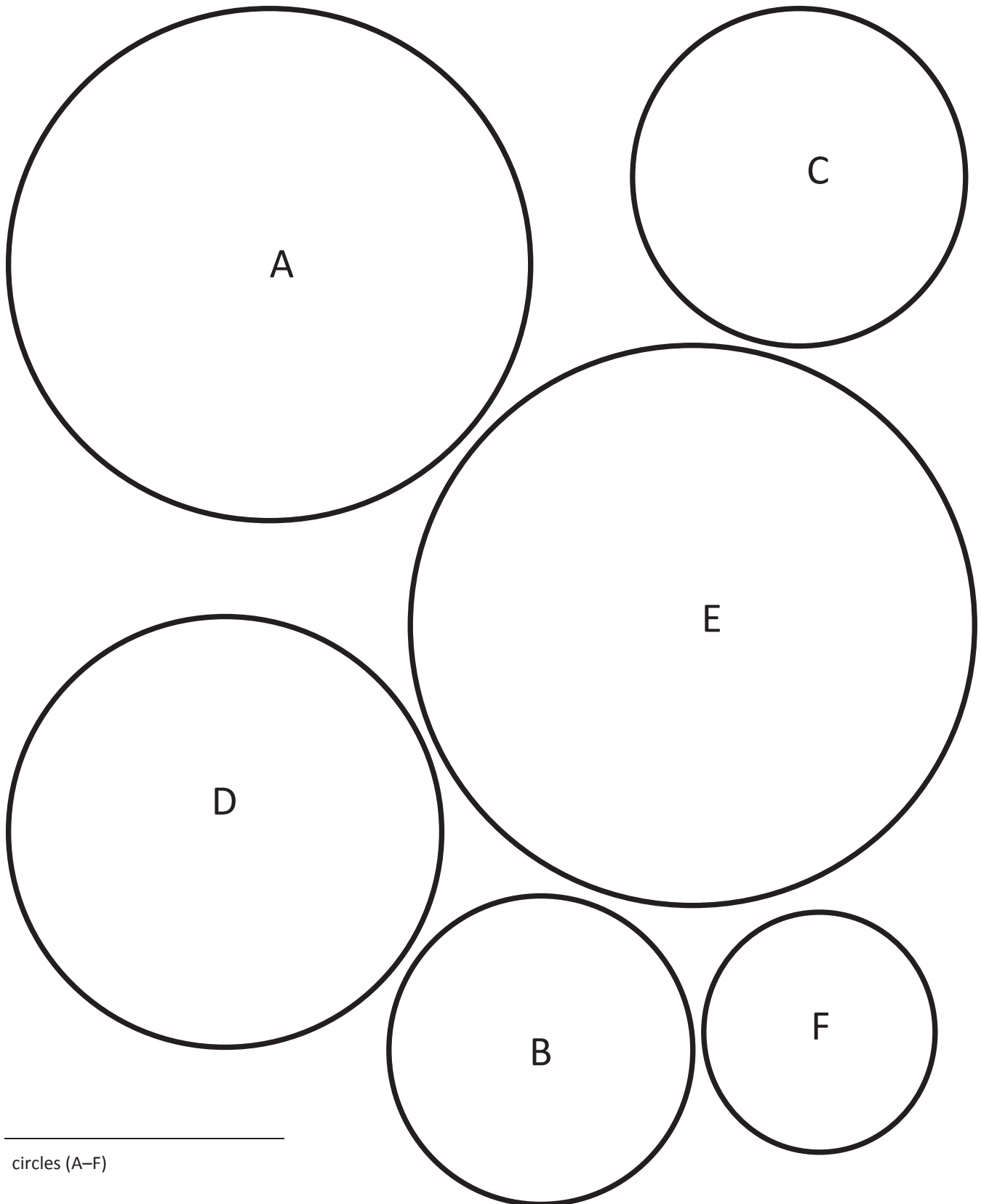
circles (A–F)

Name _____   Date _____

Evaluation Rubric
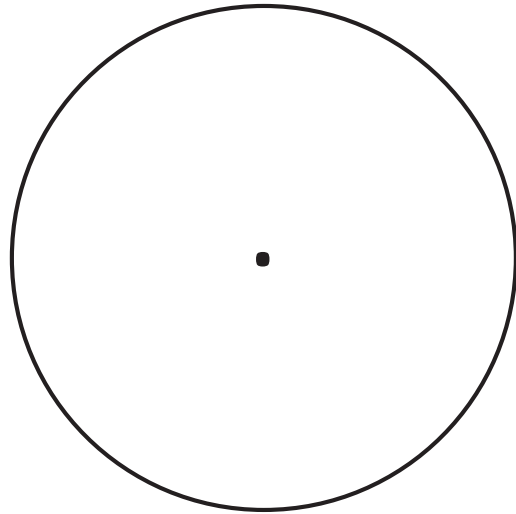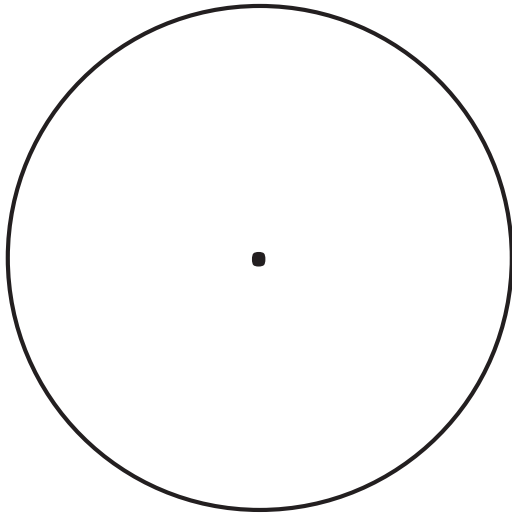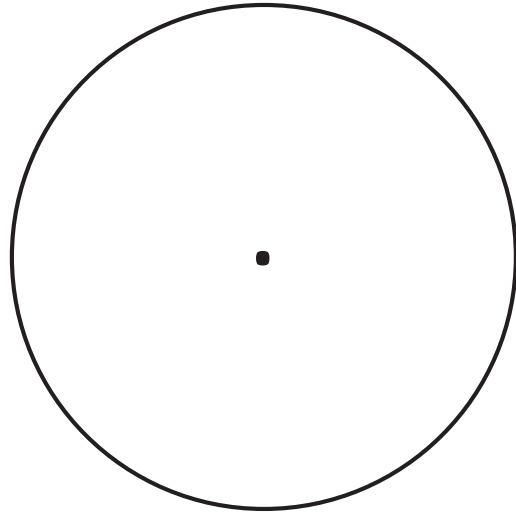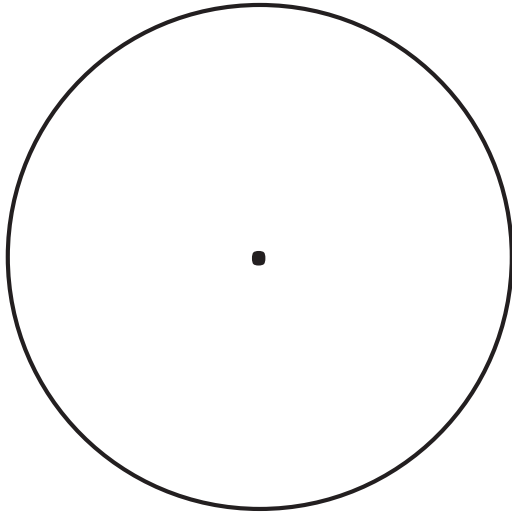
4	3	2	1	Subtotal
Perimeter calculations for all shapes are correct, and both evaluations of a classmate's project have been completed.	Perimeter calculations include 1 to 2 errors, and both evaluations of a classmate's project have been completed.	Perimeter calculations include 3 to 4 errors, and at least 1 evaluation of a classmate's project has been completed.	Perimeter calculations include 5 or more errors, and at least 1 evaluation of a classmate's project has been completed.	_____/4

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Lesson 27: Use rectangles to draw a robot with specified perimeter measurements, and reason about the different areas that may be produced.

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5

circles with dots

Lesson 32: Explore and create unconventional representations of one-half.

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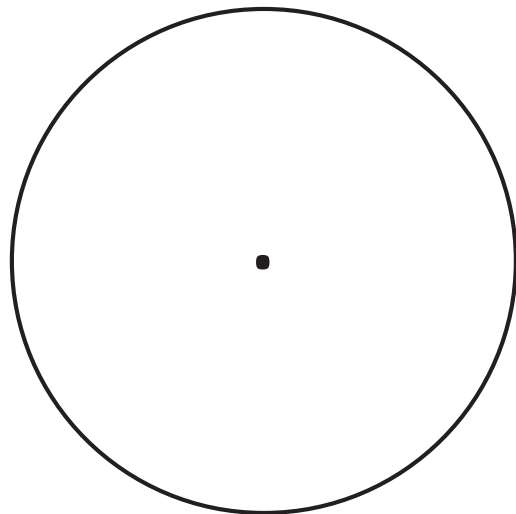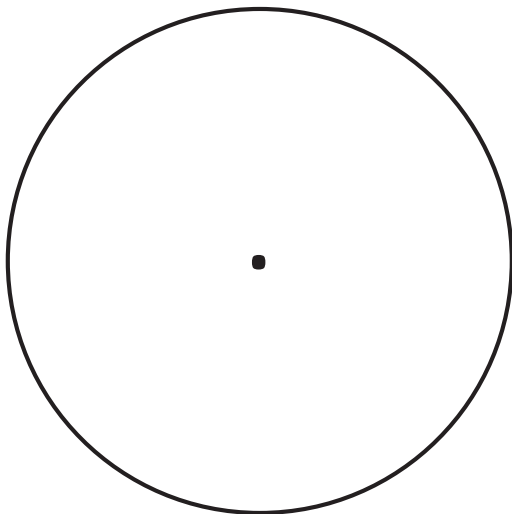
Multiplication

Materials: (S) Personal white board

T: (Draw an array with 3 rows of 2.) Say the repeated addition sentence.
S: 2 + 2 + 2 = 6.
T: (Write 3 × ____ = ____.) On your personal white board, complete the multiplication sentence.
S: (Write 3 × 2 = 6.)

Repeat using the following ideas: 4 rows of 10, 3 rows of 4, 7 rows of 3, and 8 rows of 2. Or you can think of your own.

Equal Groups

Materials: (S) Personal white board

T: (Draw a picture with 2 groups of 4 circled.) Say the total as a repeated addition sentence.
S: 4 + 4 = 8.
T: Write a division sentence that means the number of groups is unknown.
S: (Write 8 ÷ 4 = 2.)
T: Below that division sentence, write a division sentence that means the number in each group is unknown.
S: (Write 8 ÷ 2 = 4.)

Repeat using the following ideas: 5 groups of 3, 3 groups of 4, and 6 groups of 2. Or you can think of your own.

Commutative Multiplying

Materials: (S) Personal white board

T: (Draw an array with 3 rows of 2 dots.) How many rows of 2 do you see?
S: 3 rows of 2.
T: Write four different multiplication sentences for the picture.
S: (Write 3 × 2 = 6, 2 × 3 = 6, 6 = 3 × 2, and 6 = 2 × 3.)

Repeat using the following ideas: 3 rows of 5 and 4 rows of 3. Or you can think of your own.

T: (Write 4 × 2 = 2 × ____.) On your personal white board, fill in the blank.
S: (Write 4 × 2 = 2 × 4.)

Repeat using the following ideas: 9 × 5 = 5 × ____ and 3 × 6 = 6 × ____. Or you can think of your own.

Tape Diagrams

Materials: (S) Personal white board

T: (Draw a tape diagram with 5 equal units and 2 stars in the first unit.) What is the value of each unit?
S: 2 stars.
T: How many units are there?
S: 5 units.
T: Write a multiplication sentence for this tape diagram.
S: (Write 5 × 2 = 10.)

Repeat using the following ideas: 4 × 3 = 12, 8 ÷ 4 = 2, and 15 ÷ 3 = 5. Or you can think of your own.

Tens

Materials: (S) Place value cards, personal white board

Note: Place value cards can be made with index cards for personal practice.

    T: (Write 7 tens = _____.) Say the number.

    S: 70.

Repeat using the following ideas: 10 tens, 12 tens, 20 tens, 28 tens, 30 tens, and 37 tens. Or you can think of your own.

7 0

1 5 0

Place value cards

Tens and Hundreds

Materials: (S) Personal white board

    T: (Write $9 + \_\_ = 10$.) Say the missing number.

    S: 1.

    T: (Write $90 + \_\_ = 100$.) Say the missing number.

    S: 10.

    T: (Write $91 + \_\_ = 100$.) Say the missing number.

    S: 9.

    T: (Write $291 + \_\_ = 300$.) Say the missing number.

    S: 9.

Repeat using the following ideas:

$1 + \_\_ = 10$, $10 + \_\_ = 100$, $11 + \_\_ = 100$, $211 + \_\_ = 300$, $8 + \_\_ = 10$, $80 + \_\_ = 100$, $85 + \_\_ = 100$, and $385 + \_\_ = 400$.

Or you can think of your own.

Make Twenty-Four Game

Materials: (S) Set of 6 cards per pair

Note: Students play in pairs. Each pair has a set of 6 cards, each with a number (2, 3, 4, 6, 8, and 12).

    T: (Write ___ × ___ = 24.) Spread the cards out in front of you.

    T: Put your hands behind your back. I'll put a number in the first blank. When you know the number that belongs in the second blank, touch the card that shows the number. The first one of us to touch the card keeps it. Whoever has the most cards at the end wins. (Write 12 in the first blank.)

    S: (Touch the 2 card. The first to touch it keeps the card.)

Repeat. This time, however, you might make 36 with the same cards plus 9 and 18.

Write in the Parentheses

Materials: (S) Personal white board

    T: (Write $10 - 5 + 3 = 8$.) On your personal white board, copy the equation. Then, insert parentheses to make the statement true.

    S: (Write $(10 - 5) + 3 = 8$.)

Repeat using the following ideas:
$10 - 5 + 3 = 2$, $10 = 20 - 7 + 3$, $16 = 20 - 7 + 3$, $8 + 2 \times 4 = 16$, $8 + 2 \times 4 = 40$, $12 = 12 \div 2 \times 2$, $3 = 12 \div 2 \times 2$, $10 = 35 - 5 \times 5$, and $20 - 10 \div 5 = 2$.

Or you can think of your own.

Round Three- and Four-Digit Numbers

Materials: (S) Personal white board

T: (Write 87 ≈ _____.) What is 87 rounded to the nearest ten?

S: 90.

Repeat using the following ideas: 97, 43, 643, 35, and 835. Or you can think of your own.

T: (Write 253 ≈ _____.) What is 253 rounded to the nearest hundred?

S: 300.

Repeat using the following ideas: 1,253, 735, 1,735, 850, 1,850, 952, 1,371, and 1,450. Or you can think of your own.

Partition Shapes

Materials: (S) Personal white board

T: Draw a square.

S: (Draw a square.)

T: (Write $\frac{1}{2}$.) Estimate to equally partition the square into halves.

S: (Partition.)

Repeat using the following ideas: line $\frac{1}{5}$, circle $\frac{1}{4}$, circle $\frac{1}{8}$, bar $\frac{1}{10}$, and bar $\frac{1}{6}$.

Or you can think of your own.

Write the Unit Fraction

Materials: (S) Personal white board

T: (Draw a shape with $\frac{1}{2}$ shaded.) Write the unit fraction.

S: (Write $\frac{1}{2}$.)

Repeat using the following ideas: $\frac{1}{4}, \frac{1}{8}, \frac{1}{6}, \frac{1}{10}$, and $\frac{1}{5}$.

Or you can think of your own.

Greater or Less Than 1?

T: (Write $\frac{1}{2}$.) Greater or less than 1?

S: Less!

Repeat using the following ideas: $\frac{3}{2}, \frac{5}{4}, \frac{3}{4}, \frac{3}{7}, \frac{5}{3}$, and $\frac{5}{2}$.

Or you can think of your own.

Draw Fractions from Part to Whole

Materials: (S) Personal white board

T: Draw 1 unit on your personal white board.

S: (Draw 1 unit.)

T: Label the unit $\frac{1}{3}$. Now, draw the whole that goes with your unit of $\frac{1}{3}$.

Repeat using the following ideas: $\frac{1}{5}, \frac{1}{6}, \frac{1}{4}$, and $\frac{1}{2}$.

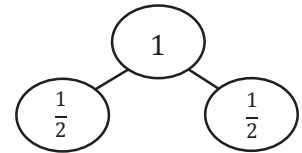Or you can think of your own.

Draw Number Bonds of One

Materials: (S) Personal white board

T: Draw a number bond to partition one into halves.

S: (Draw.)

T: How many copies of 1 half did you draw to make one?

S: 2 copies.

Repeat using the following ideas: thirds, fourths, fifths, sixths, sevenths, etc. Or you can think of your own.