Chapter 9

Name _____

Two-Dimensional Figures and Spatial Sense

The Shape of Signs

You need
- art paper
- colored pencils or markers
- straightedge

Create and sort signs.

STEP 1 Making a Sign

Draw a sign on a sheet of paper.

How many sides does your sign have? _____

How many corners does your sign have? _____

STEP 2 Sorting the Signs

Sort the signs in any way. Use words to tell how you sorted.

_____

_____

STEP 3 Sorting Another Way

Tell another way you could sort the signs.

_____

_____

_____

_____

_____

_____

_____

Investigation

School-Home Connection

Dear Family,

Today we started Chapter 9 of ***Think Math!*** In this chapter, I will explore two-dimensional figures, symmetry, area, and how to record paths. There are NOTES on the Lesson Activity Book pages to explain what I am learning every day.

Here are some activities for us to do together at home. These activities will help me understand two-dimensional figures and symmetry.

Love,

_____

Family Fun

I Spy

Work with your child to play a game about two-dimensional figures, called *I Spy.*

- Review the names of these figures.

square **rectangle** **triangle**

- To play the game, you secretly choose an object in the room that is (or contains) one of these figures. Then you say, "I spy a square (rectangle or triangle)."
- Your child asks *yes/no* questions about the object until he or she guesses the correct one. Some good questions to ask are: "Is the square in a place that we can easily see?" or "Does the object have more than one square?"
- Take turns selecting an object and asking the questions.

Lines of Symmetry

Work with your child to make a figure that has a line of symmetry.

- You will need paper and scissors. Help your child fold the sheet of paper in half. Make sure the two halves match.
- Help your child draw a design that starts and ends at the fold. Together, guess what the shape will look like when it is cut out and the paper is opened.
- Hold the folded side of the paper and cut out the design. You should not cut along the fold.

- Invite your child to unfold the paper and draw a line down the fold. You made a line of symmetry!

Name _____ Date/Time _____

Sorting Polygons by Attributes

NCTM Standards 2, 3, 6, 7, 8, 9, 10

Count the polygons in the picture.
Complete each sentence.

1. There are 18 polygons in the picture.

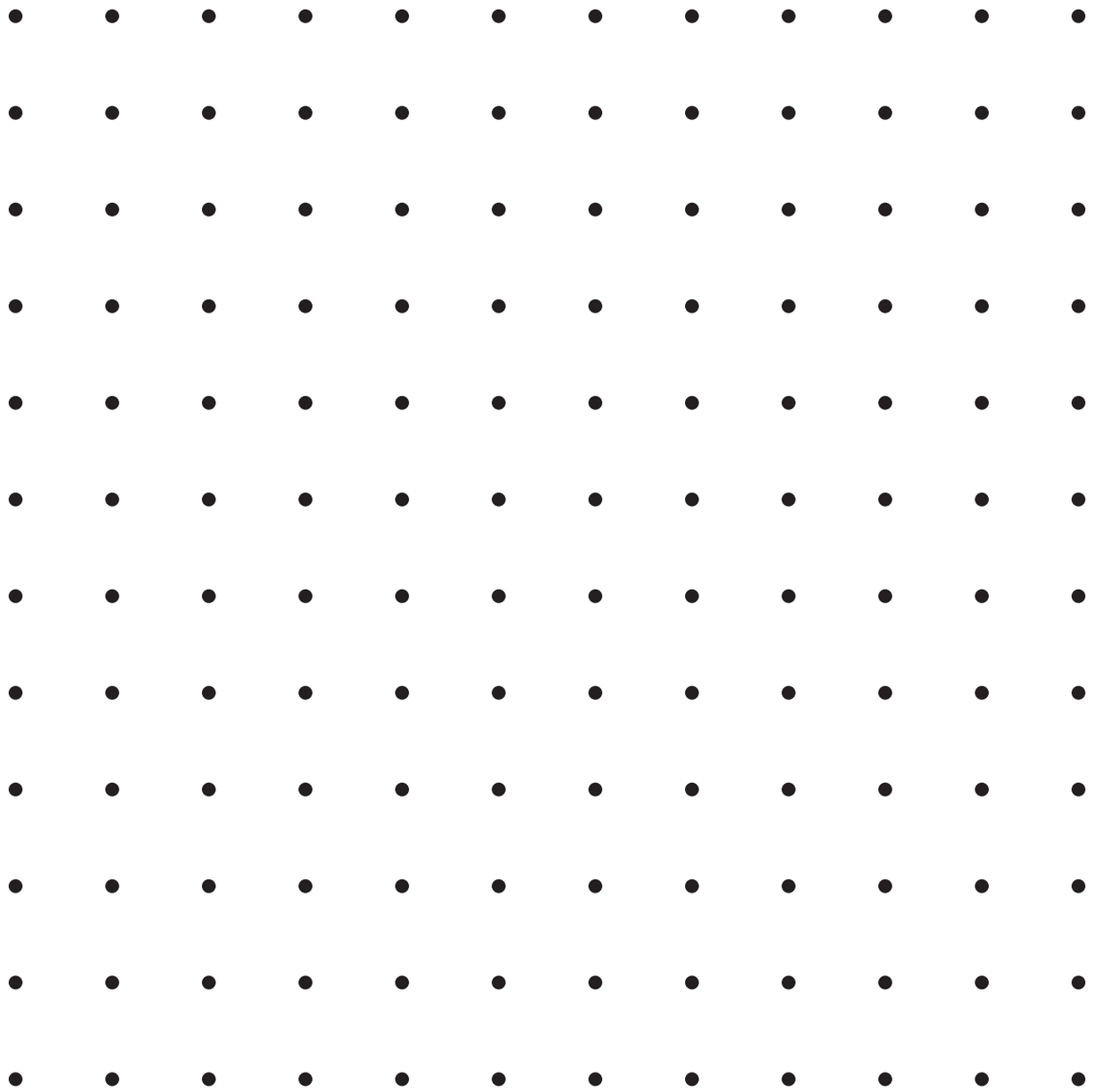
2. There is _____ polygon with 3 sides in the picture.

3. There are _____ polygons with 4 sides in the picture.

4. There are _____ polygons with more than 4 sides.

NOTE: Your child is learning about polygons. A polygon is a closed figure with all straight sides.

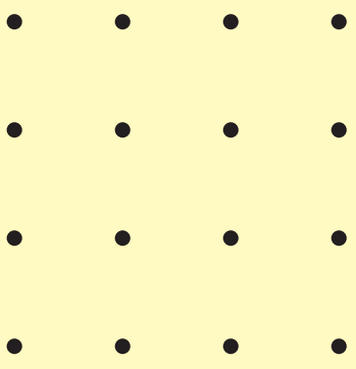
5. Draw a design using only polygons. Use a straightedge. Start and end each line at a dot.



Problem Solving

6. I have 4 straight sides. I am closed and have no curves. All of my sides are the same length. What figure am I?

_____

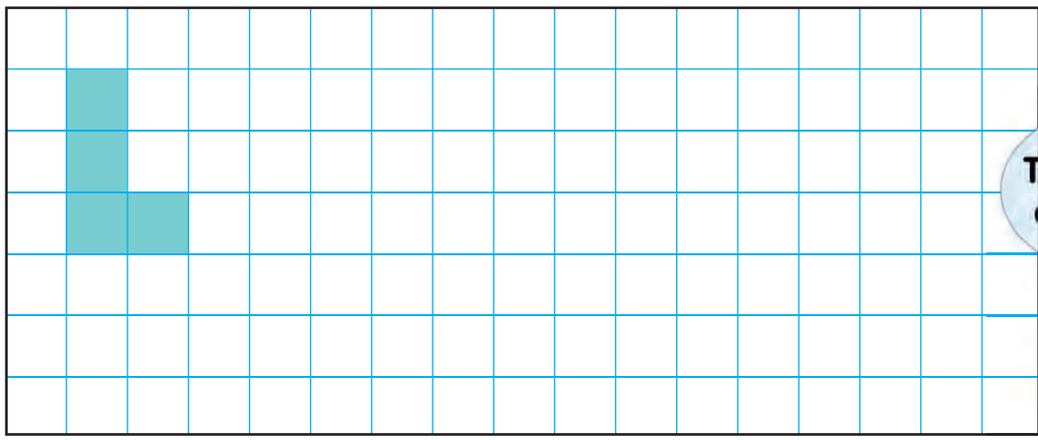


Name _____ Date/Time _____

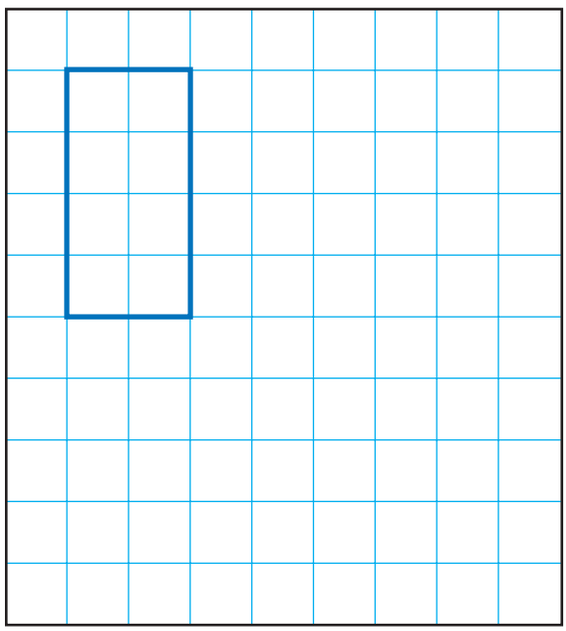
Congruent and Similar Figures

NCTM Standards 3, 4, 6, 7, 8, 9, 10

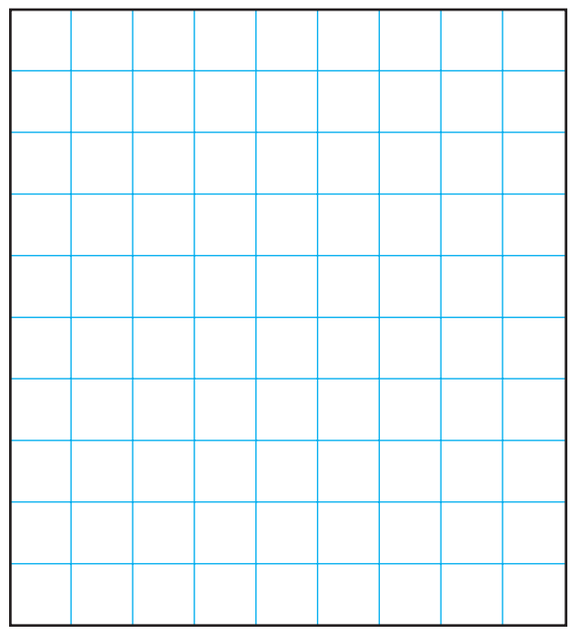
1. Draw the same polygon in different positions. Use 4 squares for each polygon. Draw as many congruent polygons as you can.



2. Draw a figure congruent to this one.



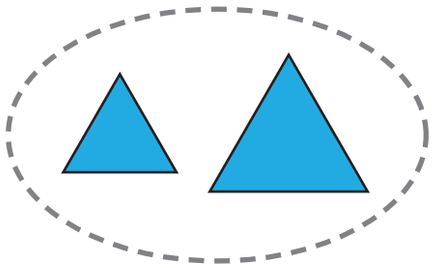
3. Draw 2 congruent figures of your own.



NOTE: Your child is learning about congruent and similar figures. Congruent figures are the same size and shape. Similar figures may be different sizes.

Circle the pairs of figures that are similar.
Put an X on the pairs that are *not* similar.

4.



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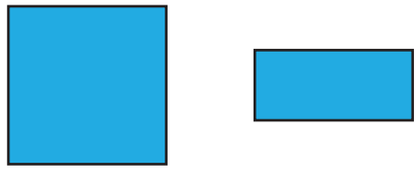
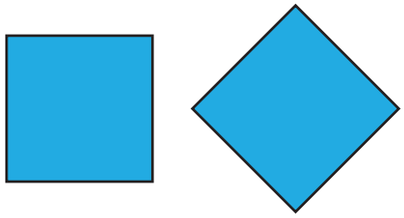


6.



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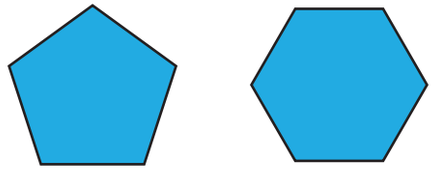
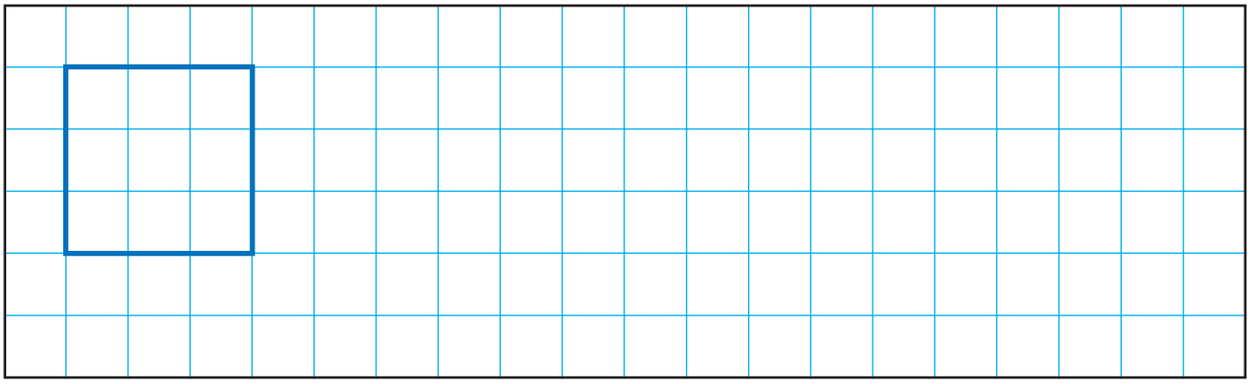


8. Draw 2 figures similar to this one.



Problem Solving

9. Robin says that she can make a square with 5 congruent squares. Is she correct? Use words, numbers, or pictures to explain.

Name _____ Date/Time _____

Building with Triangles

NCTM Standards 2, 3, 4, 6, 7, 8, 9, 10

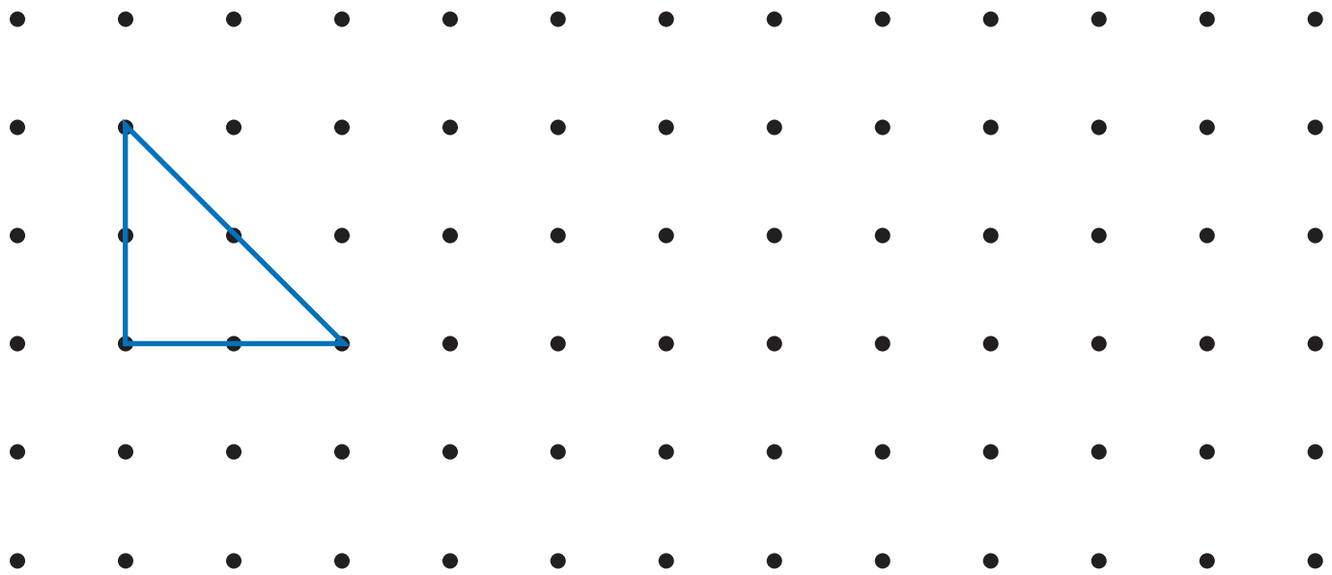
Draw lines in each figure to make 4 small congruent triangles.

1.

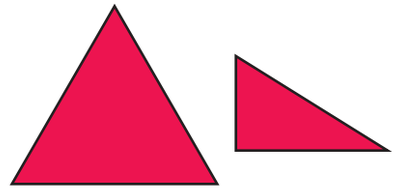
2.

NOTE: Your child is learning to make congruent and similar triangles. Similar triangles have the same shape, but do not have to be the same size.

3. Draw a similar triangle on the grid.

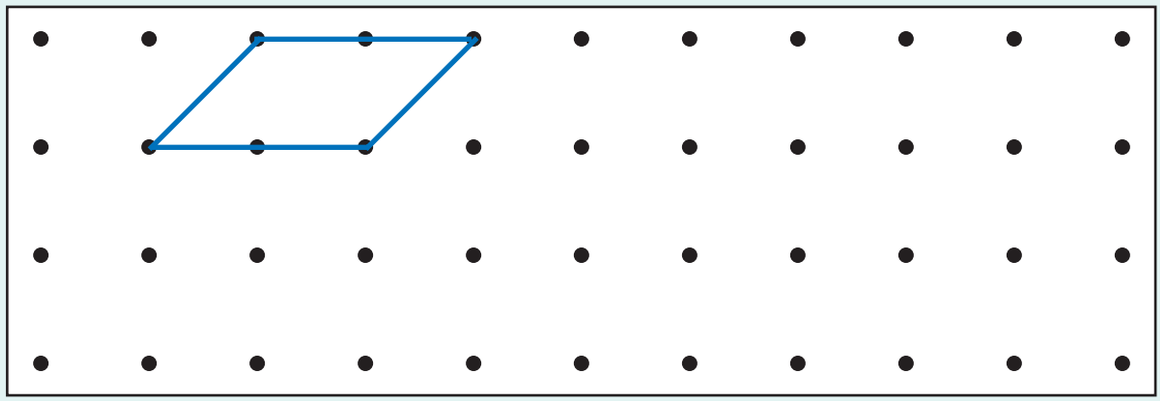


4. What is the same about these 2 triangles?
What is different?



Challenge

5. Draw a similar figure on the grid.
Use 4 of the smaller figures.



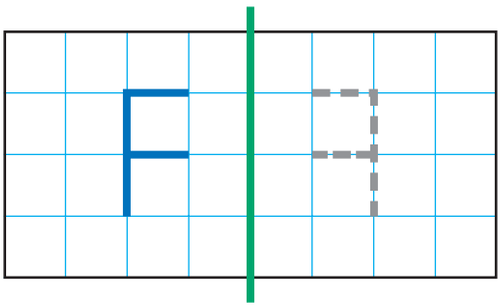
Name _____ Date/Time _____

Looking at Reflections

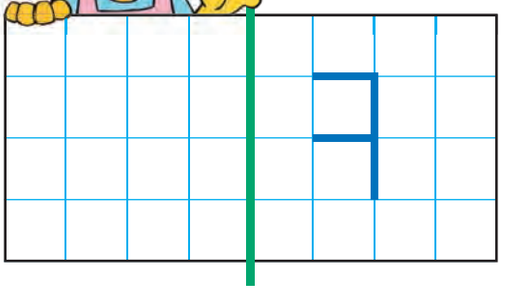
NCTM Standards 3, 6, 7, 8, 9, 10

Draw the reflection of each figure. Use a mirror to help you.

1.



2.



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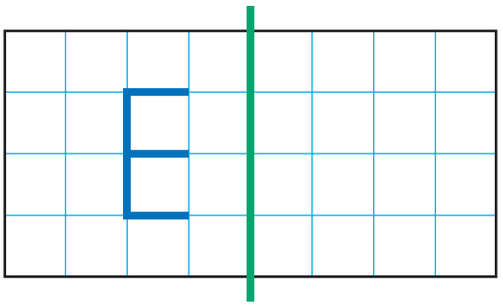

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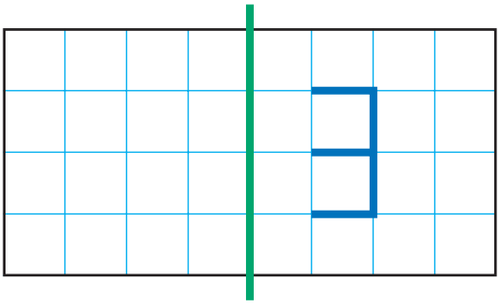

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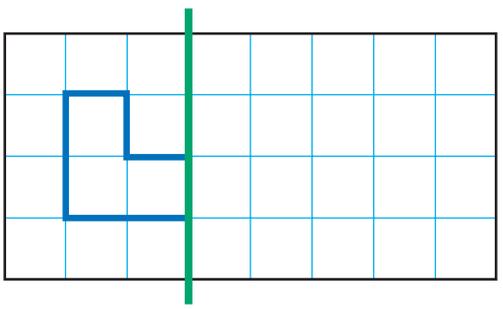

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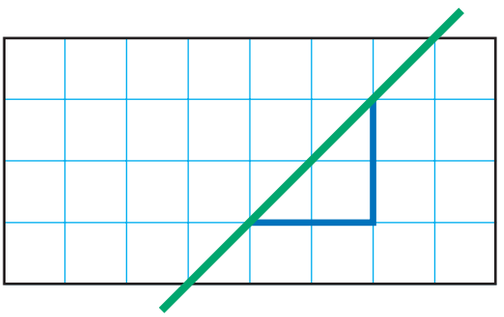

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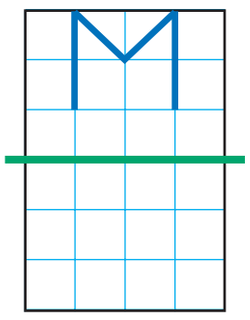

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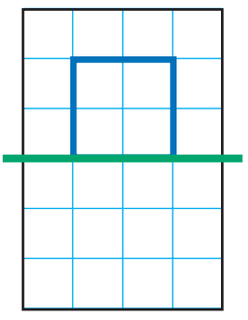

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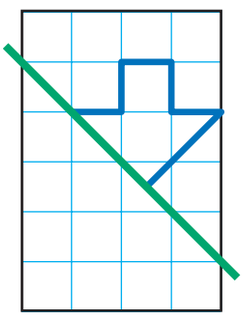
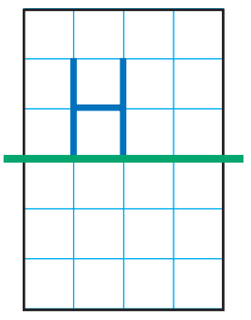


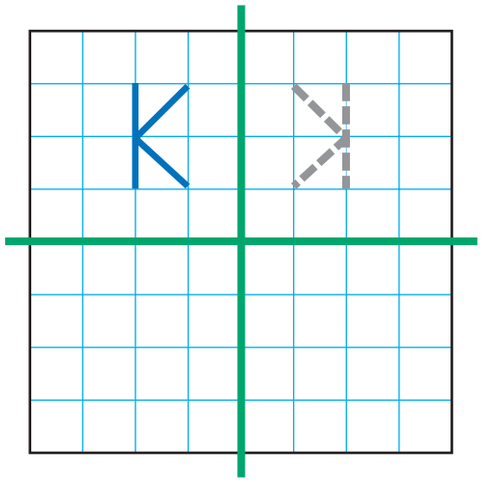
10.



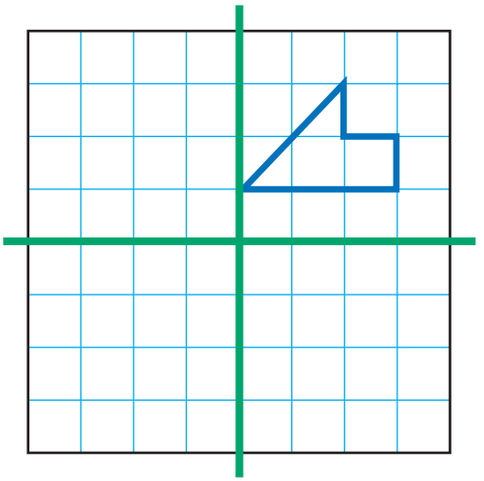
NOTE: Your child is learning to draw reflections of letters and figures. Together, hold a page from a book in front of a mirror and try to read the words.

Draw the reflections. Work across and down within each grid.

11.



12.



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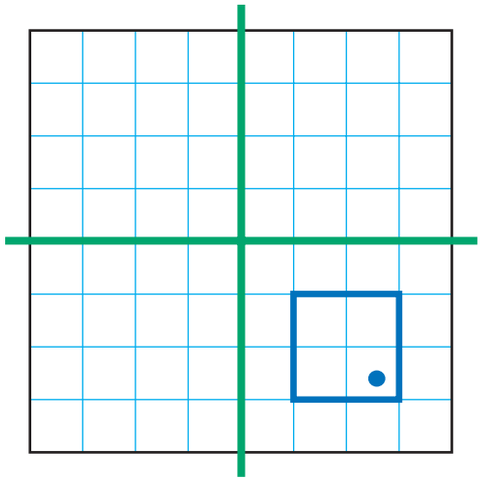
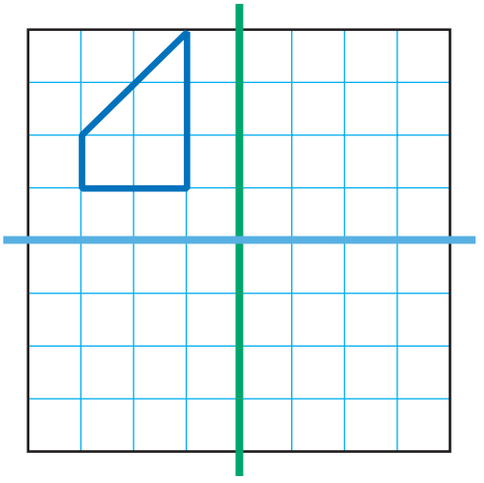


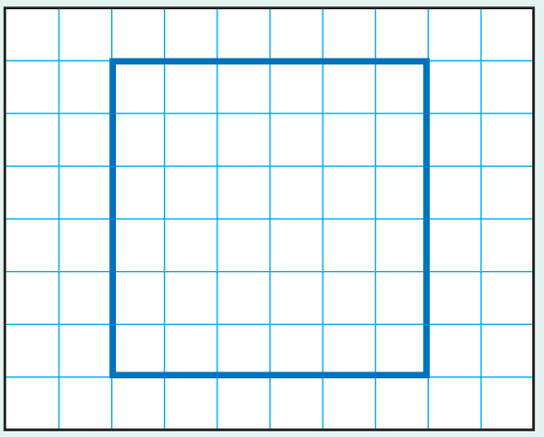
14.



Challenge

15. How many different places can you put a mirror on the square and see the whole square? Draw a line where you put the mirror each time.

_____ places



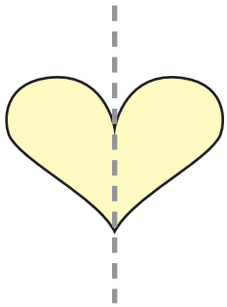
Name _____ Date/Time _____

Lines of Symmetry

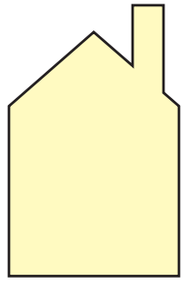
NCTM Standards 2, 3, 6, 7, 8, 9, 10

Look at each picture. Can you divide it into 2 matching parts? If so, draw all the lines of symmetry. If not, write *no.*

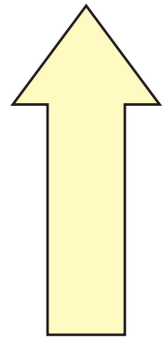
1.



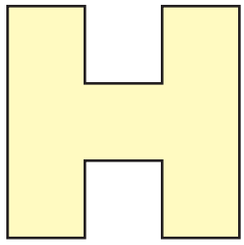
2.



3.

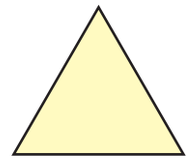


4.



5.

6.



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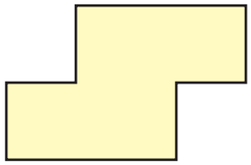

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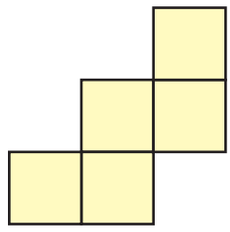
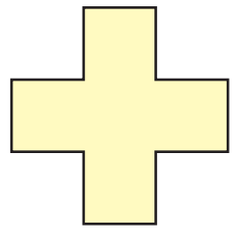


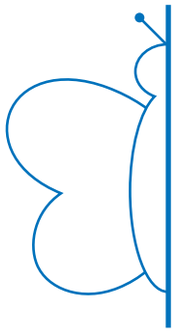
9.



NOTE: Your child is learning about symmetry. Together, look for objects at home that have two identical matching parts when folded on a line.

Draw the other half of each picture.

10.



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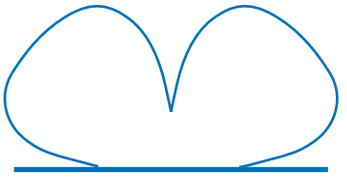

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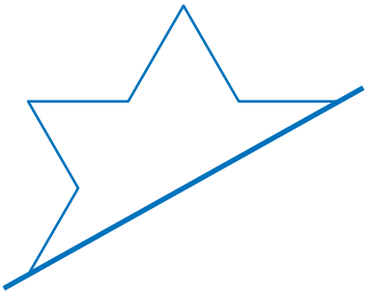


Challenge

Draw a picture for each line of symmetry.

14.

15.

Chapter 9
Lesson 6

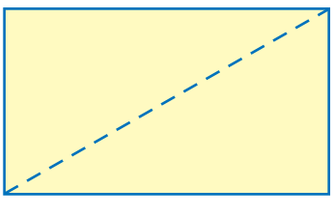
Name _____ Date/Time _____

Cutting Polygons Apart

NCTM Standards 2, 3, 6, 7, 8, 9, 10

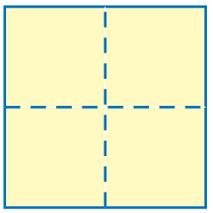
What new figures do you get if you cut along the lines?

1.

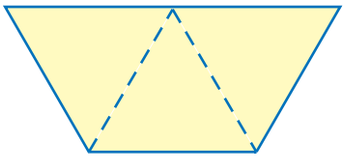


triangles

2.



3.



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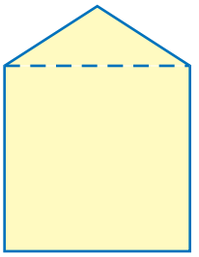
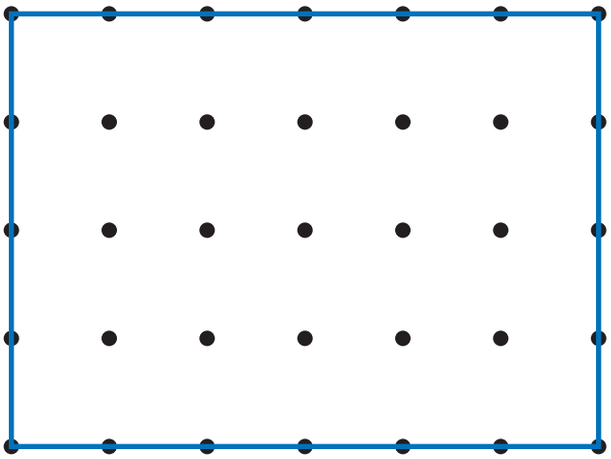
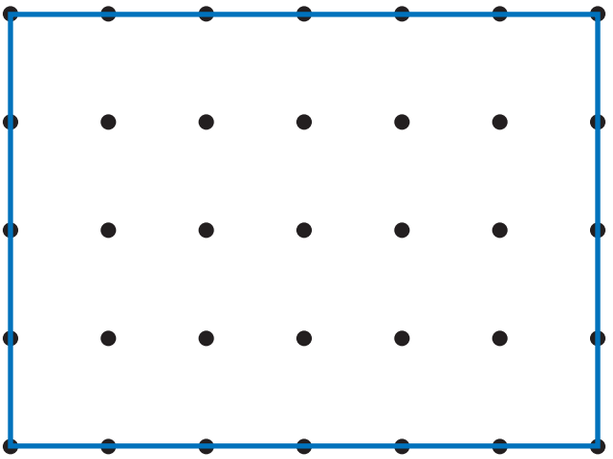


5. Cut the rectangle into 2 congruent pieces. Show 2 different ways.

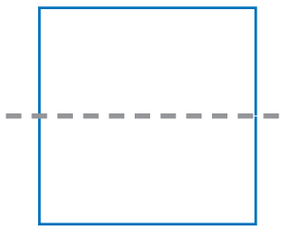




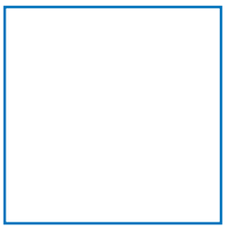
NOTE: Your child is learning to cut polygons to make other polygons. Together, try to cut a sheet of paper into 2 triangles.

Draw a line or lines to show the new figures.

6. Make 2 rectangles.



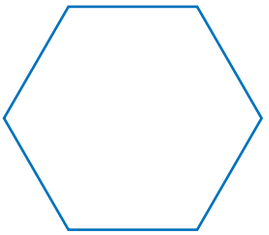
7. Make 2 triangles.



8. Make 4 triangles.

9. Make 2 triangles and 2 rectangles.

10. Mary cut the hexagon from vertex to vertex to make 2 pieces. How many sides would each piece have?

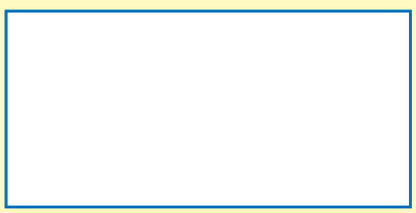


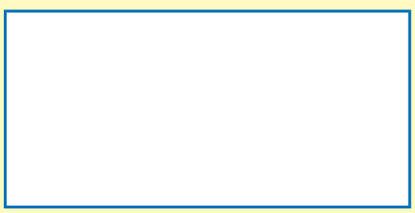
_____ sides

_____ sides

Problem Solving

11. Raffi drew 4 lines that cut her rectangle into only triangles. How many triangles did she make? Draw 2 different ways to do it.





_____ triangles

_____ triangles

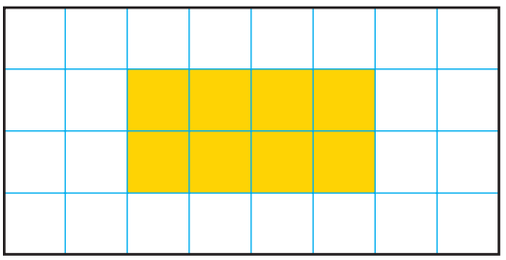
Chapter 9
Lesson 7

Name _____ Date/Time _____

Measuring Area

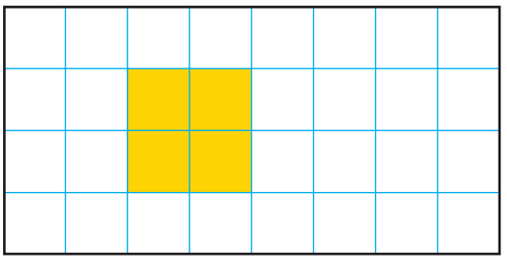
NCTM Standards 1, 2, 3, 4, 6, 7, 8, 9, 10

What is the area? Each ☐ is 1 square unit.

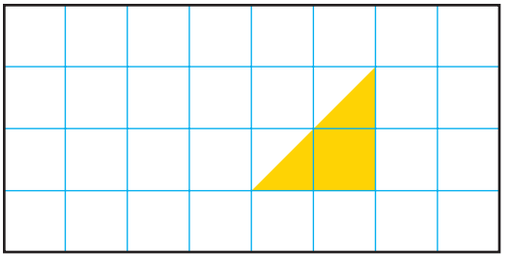
1. 

8

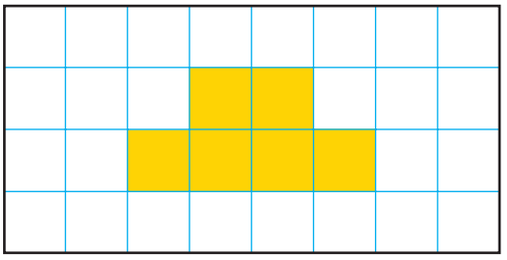
_____ square units

2. 

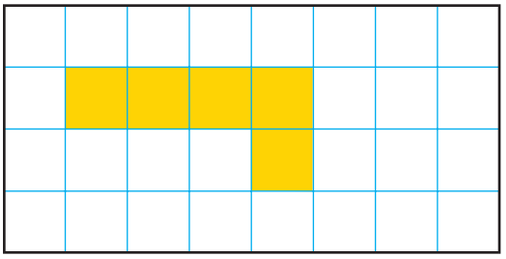
_____ square units

3. 

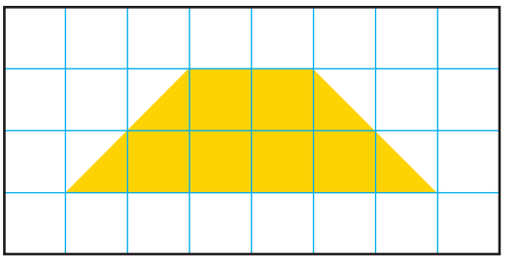
_____ square units

4. 

_____ square units

5. 

_____ square units

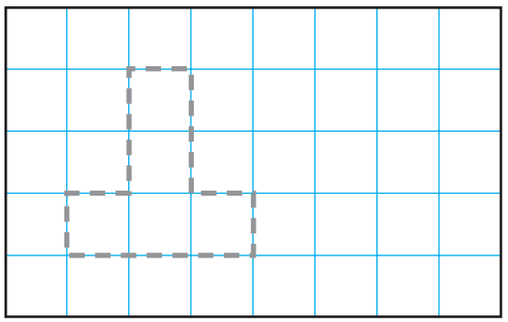
6. 

_____ square units

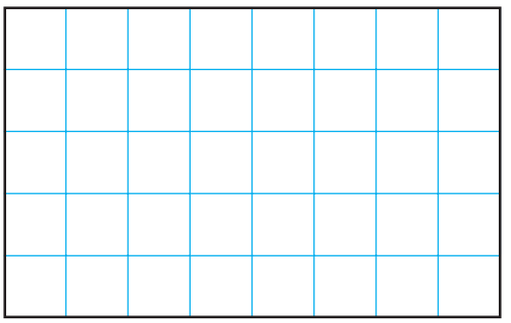
NOTE: Your child is learning to find the area of a polygon by counting the square units inside the figure.

Draw each figure.

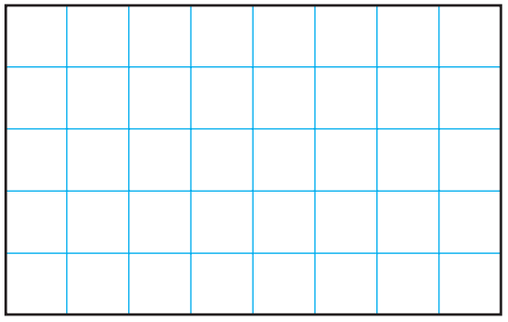
7. a polygon of 5 square units



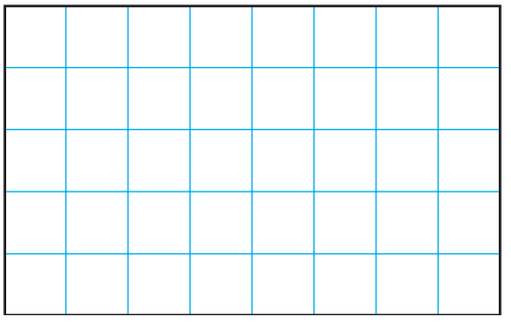
8. a polygon of 6 square units



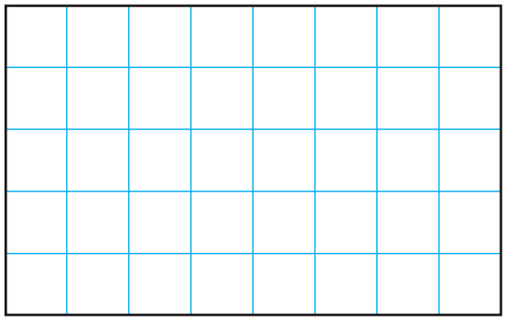
9. a polygon of 3 square units



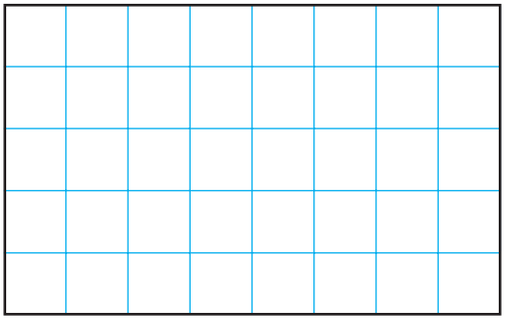
10. a polygon of 8 square units



11. a polygon of 9 square units with 8 sides

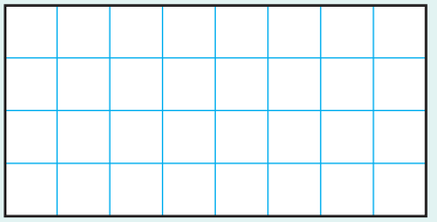


12. a polygon of 5 square units with 8 sides



Challenge

13. Draw a polygon with an area of $2\frac{1}{2}$ square units. Explain how to count the area of your polygon.



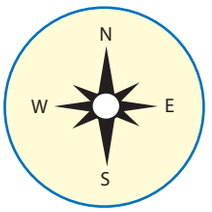
_____

_____

Name _____ Date/Time _____

Recording Paths

NCTM Standards 2, 4, 6, 7, 8, 9, 10

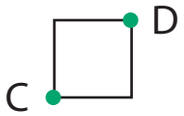


What are the shortest paths from dot to dot? Find all possible ways.

1. from **A** to **B**

_____

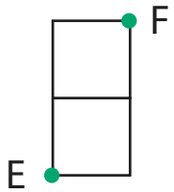
2. from **C** to **D**



_____ _____

_____ _____

3. from **E** to **F**

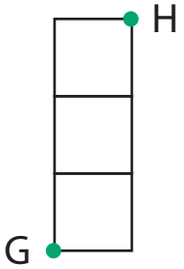


_____ _____ _____

_____ _____ _____

_____ _____ _____

4. from **G** to **H**



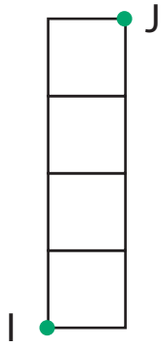
_____ _____ _____ _____

_____ _____ _____ _____

_____ _____ _____ _____

_____ _____ _____ _____

5. from **I** to **J**



_____ _____ _____ _____ _____

_____ _____ _____ _____ _____

_____ _____ _____ _____ _____

_____ _____ _____ _____ _____

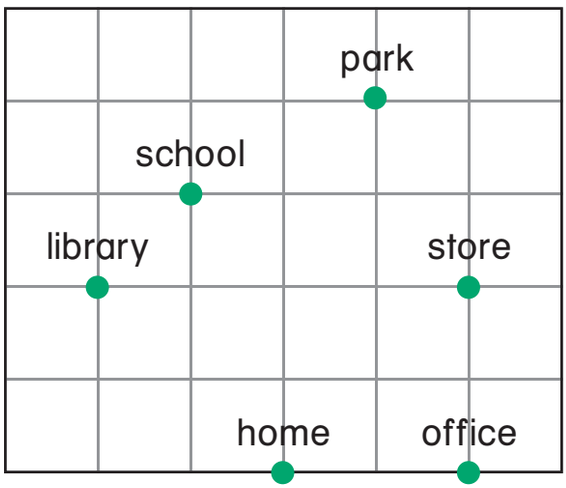
_____ _____ _____ _____ _____

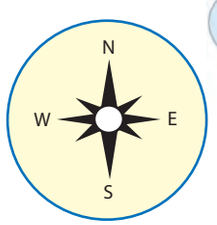
6. Complete the table.

Path	Number of Ways
A to **B**	
C to **D**	
E to **F**	
G to **H**	
I to **J**	

NOTE: Your child is learning to describe paths on simple maps using notation such as N, S, E, and W to represent the directions North, South, East, and West.

What is a shortest path from place to place?





7. from home to the store ____ ____ ____ ____ ____

8. from the store to school ____ ____ ____ ____ ____

9. from the park to home ____ ____ ____ ____ ____

10. Choose your own starting and ending places.
Tell what path you will take.

from _____ to _____ ____ ____ ____ ____ ____

Problem Solving

11. Tina goes to the office and the store.
She starts and ends at home. If Tina takes
a shortest path, how many blocks does
she walk in all? Explain.

_____ blocks

_____

_____

_____

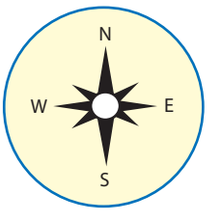
_____

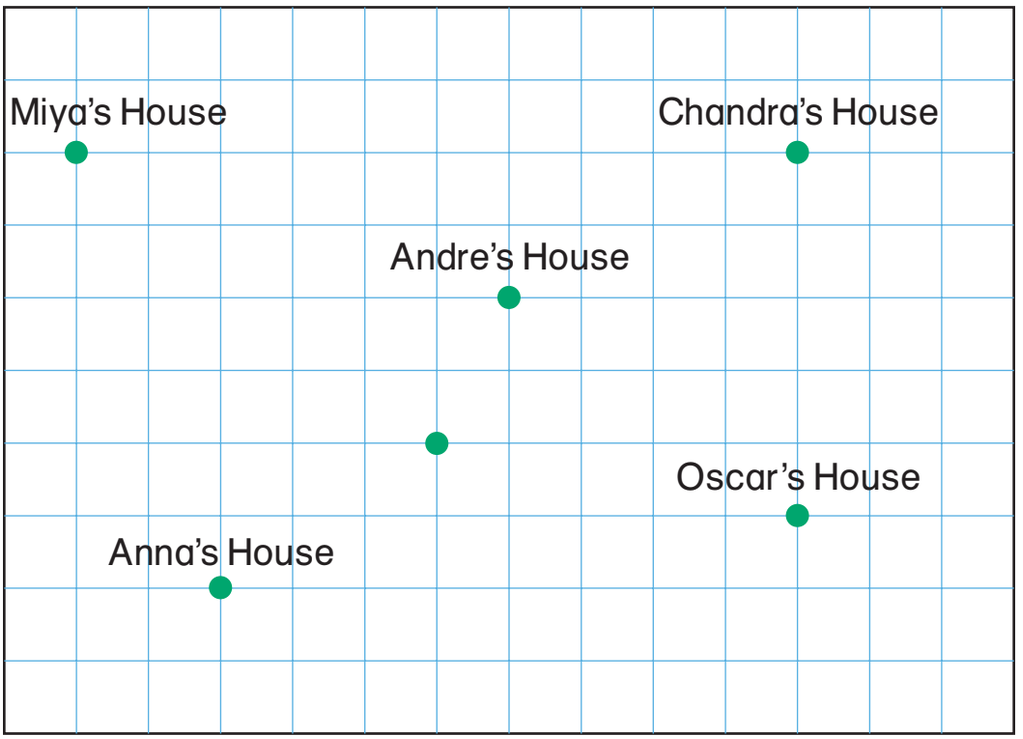
Name _____ Date/Time _____

Directions from Here to There

NCTM Standards 2, 3, 6, 7, 8, 9, 10

What are the shortest paths from place to place? Write the shorthand that describes them all.





1. from Anna's house to Miya's house 6N 2W

2. from Chandra's house to Andre's house _____

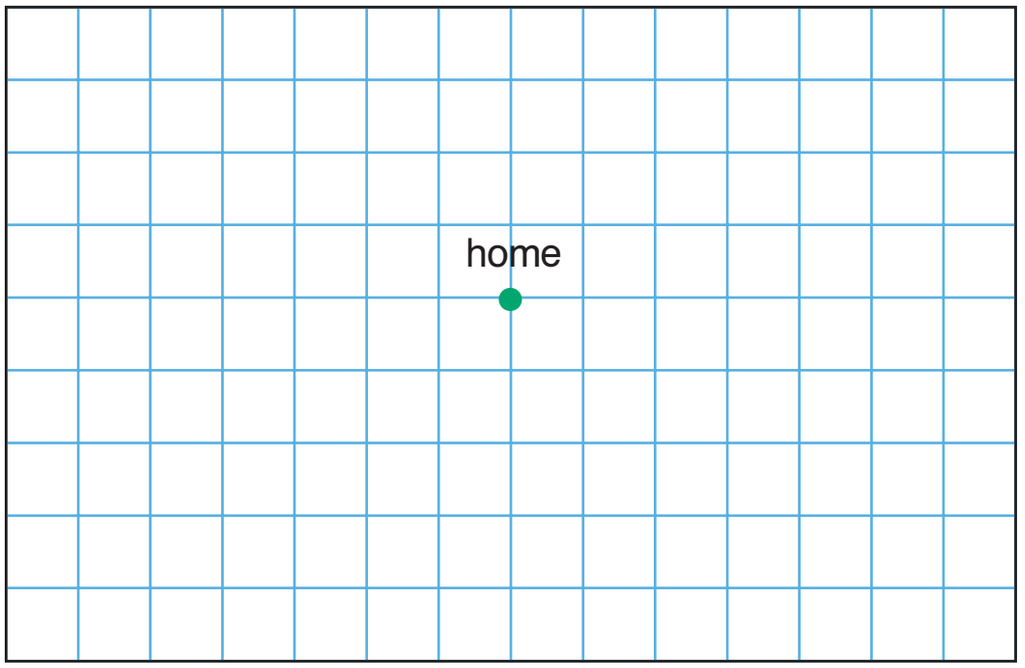
3. from Andre's house to Oscar's house _____

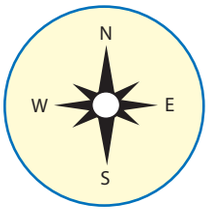
4. from Anna's house to Andre's house _____

5. Draw a dot anywhere on the map to show a new house. What is the shortest path from Oscar's house to the new house? _____

NOTE: Your child is learning to describe relative position on a map using the directions north, south, east, and west.

Use the clues to mark each place on the map.





6. the store

The shortest paths from home to the store are 4W 2S.

7. the school

The shortest paths from home to the school are 5E 1N.

8. the park

The shortest paths from the school to the park are 5S 8W.

9. the library

The shortest paths from home to the library are 2S 3E.

10. Compare the shortest paths from home to the store and then from the store to home. What can you say about the lengths of the 2 paths?

Challenge

11. The bank is 4 blocks away from the store. It is 4 blocks away from home. It is 5 blocks away from the park. Mark the bank on the map.

Name _____ Date/Time _____

Problem Solving Strategy

Draw a Picture

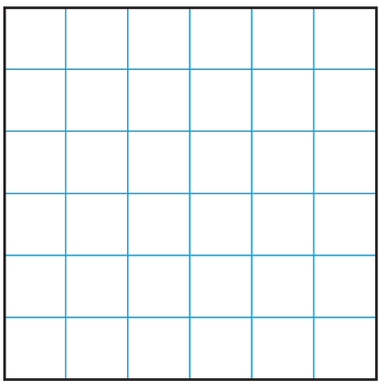
NCTM Standards 1, 2, 3, 6, 7, 8, 9, 10

Understand
Plan
Solve
Check

1. Eve has 3 congruent square tiles. She wants to build a polygon with just 1 line of symmetry. What polygon can she make?

_____

_____



2. Bob wants to cut a rectangle into 2 congruent pieces. What figures can he make?

3. Lisa has 6 game cards. Half of the cards have hearts on them. The rest of the cards have flowers on them. How many of the cards have flowers on them?

_____ cards

NOTE: Your child is exploring different ways to solve problems. Sometimes drawing a picture is an efficient way to solve a problem.

Problem Solving Test Prep

1. Marie gives $\frac{1}{4}$ of her cookies to Matt. She keeps the 6 cookies that are left. How many cookies did Marie have to start?

Ⓐ 4 cookies

Ⓑ 8 cookies

Ⓒ 12 cookies

Ⓓ 16 cookies

2. The chef cooks 5 pancakes every 2 minutes. How many pancakes would he make after 10 minutes?

Minutes	2	4	6	8	10
Pancakes	5				

Ⓐ 9 pancakes

Ⓑ 10 pancakes

Ⓒ 20 pancakes

Ⓓ 25 pancakes

Show What You Know

3. Fran has 28¢. What is the smallest number of coins she could have?

_____ coins

Explain how you know that this is the smallest number.

4. Mike can fit about 25 beans in his hand. He puts the beans in a cup. About how many beans might fill the cup?

about _____ beans

Explain how you made your estimate.

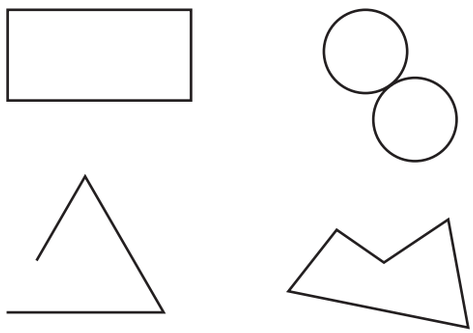
Name _____ Date/Time _____

Chapter 9

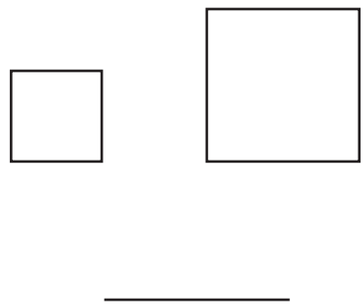
Review/Assessment

NCTM Standards 2, 3, 4, 6, 7, 8, 9, 10

1. Circle the figures that are polygons. Lesson 1

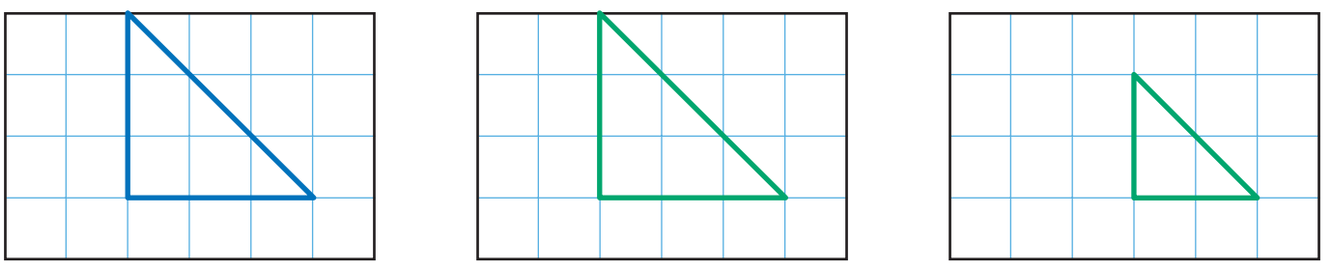


2. Are the figures similar? Write **yes** or **no.** Lesson 3



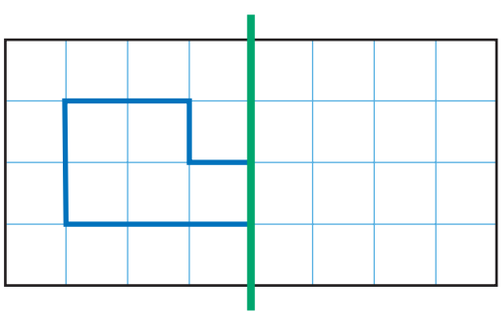
_____

3. Circle the figure congruent to the blue triangle. Lesson 2

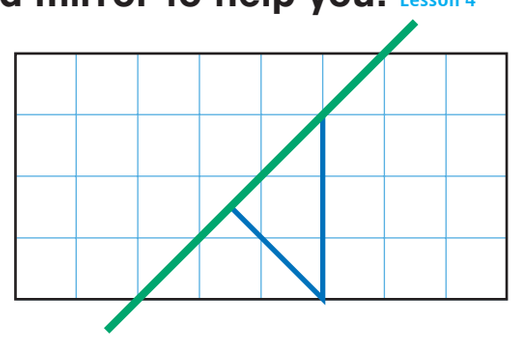


Draw the reflection of each figure. Use a mirror to help you. Lesson 4

4.

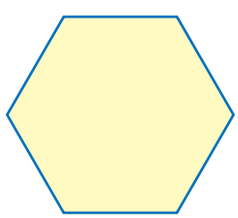


5.



Can you divide each picture into 2 matching parts? If so, draw as many lines of symmetry as you can. If not, write *no.* Lesson 5

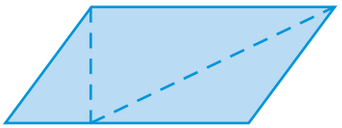
6.



7.

What new figures do you get if you cut along the lines? Lesson 6

8.



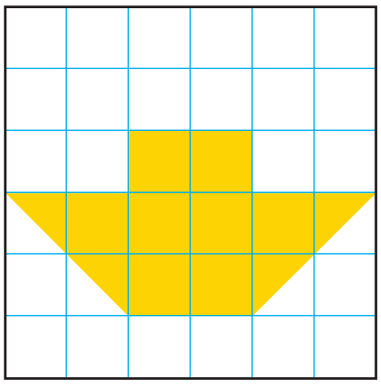
_____

9.

_____

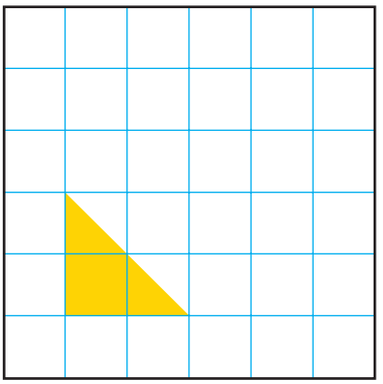
What is the area? Each ☐ is 1 square unit. Lesson 7

10.



_____ square units

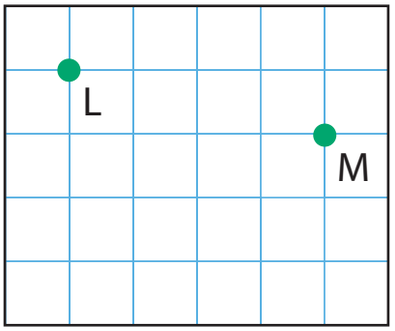
11.



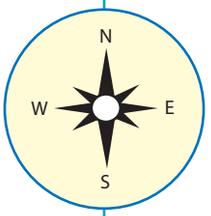
_____ square units

What are the shortest paths from L to M? Write the shorthand. Lessons 8, 9

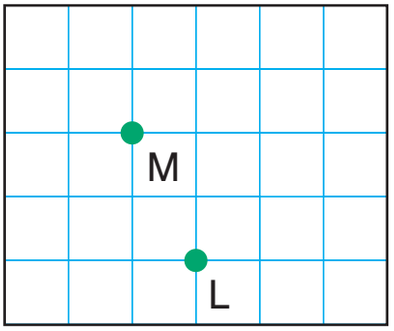
12.



_____



13.



_____

Problem Solving Lesson 10

14. Kelly wants to cut a square into 3 congruent pieces. What figures can she make? Draw a picture.