Name

Problem Solving • Shape Patterns

Essential Question How can you use the strategy *act it out* to solve pattern problems?

Common Core **Operations and Algebraic Thinking—4.OA.C.5**
MATHEMATICAL PRACTICES
MP4, MP7, MP8

Unlock the Problem · Real World

You can find patterns in fabric, pottery, rugs, and wall coverings. You can see patterns in shape, size, position, color, or number of figures.

Sofia will use the pattern below to make a wallpaper border.
What might be the next three figures in the pattern?

Use the graphic organizer below to solve the problem.

Read the Problem

What do I need to find?	What information do I need to use?	How will I use the information?
I need to find the next three _____ in the pattern.	I need to use the _____ of each figure in Sofia's pattern.	I will use pattern blocks to model the _____ and act out the problem.

Solve the Problem

Describe how you acted out the problem to solve it.

I used a trapezoid and triangle to model the first

figure in the pattern. I used a _____ and

_____ to model the second figure in
the pattern. I continued to model the pattern by
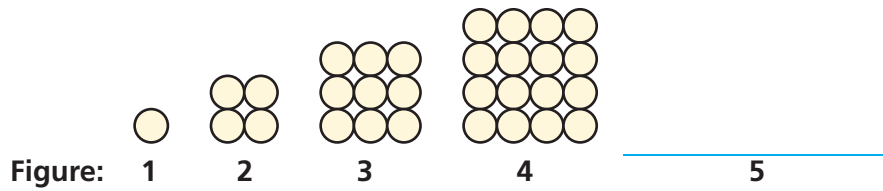repeating the models of the first two figures.

These are the next three figures in the pattern.

Math Talk

MATHEMATICAL PRACTICES ⑦
Look for a Pattern How can you describe the shape pattern using numbers?

🔑 Try Another Problem

Draw what might be the next figure in the pattern.

Figure: 1   2   3   4   5

How can you describe the pattern?

Read the Problem

What do I need to find?	What information do I need to use?	How will I use the information?

Solve the Problem

1. Use the figures to write a number pattern. Then describe the pattern in the numbers.

   _____

   _____

   _____

Math Talk

Look for Structure What other strategy could you use to solve the problem?

2. What might the tenth number in your pattern be? Explain.
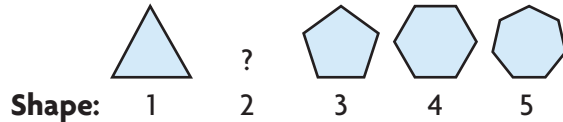
   _____

   _____

Name _____
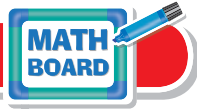
Unlock the Problem

✓ Use the Problem Solving MathBoard.
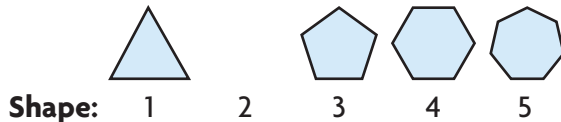✓ Underline the important facts.
✓ Choose a strategy you know.

1. Marisol is making a pattern with blocks.
What might the missing shape be?

First, look at the blocks.

Shape: 1   ?2   3   4   5

Next, describe the pattern.

_____

_____

Finally, draw the missing shape.

Shape: 1   2   3   4   5

2. Use the shapes to write a number pattern. Then describe the
pattern in the numbers.

_____

3. **THINK SMARTER**   What if the pattern continued? Write an
expression to describe the number of sides the sixth shape has
in Marisol's pattern.

_____

4. Sahil made a pattern using circles. The first nine circles are
shown. Describe the pattern. If Sahil continues the pattern,
what might the next three circles be?

_____
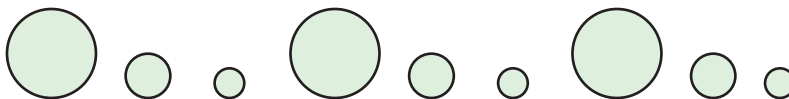
On Your Own

Use the toy quilt designs for 5–6.

5. *THINK SMARTER* Lu is making a quilt that is 20 squares wide and has 24 rows. The border of the quilt is made by using each toy design equally as often. Each square can hold one design. How many of each design does she use for the border?

_____

6. *MATHEMATICAL PRACTICE* ⑤ **Communicate** Starting in the first square of her quilt, Lu lined up her toy designs in this order: plane, car, fire truck, helicopter, crane, and wagon. Using this pattern unit, which design will Lu place in the fifteenth square? Explain how you found your answer.

_____

_____

_____

_____
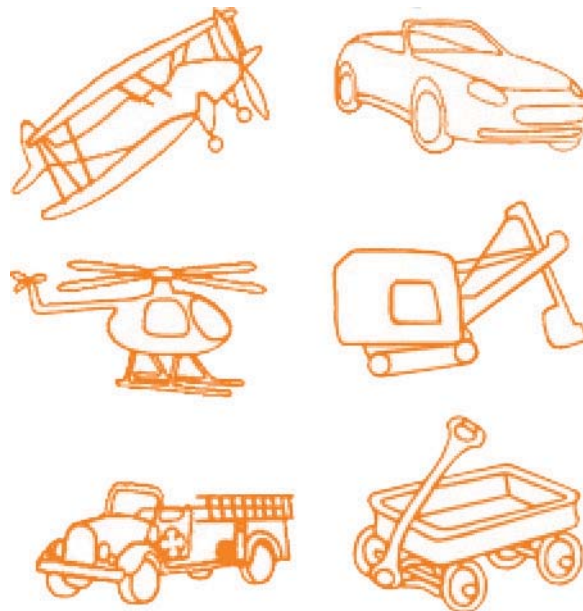
7. *GO DEEPER* Missy uses 1 hexagonal, 2 rectangular, and 4 triangular pieces of fabric to make 1 bug design for a quilt. If she uses 70 pieces in all to make bug designs, how many of each shape does she use?

_____

_____

8. *THINK SMARTER* Norris drew the pattern shown.
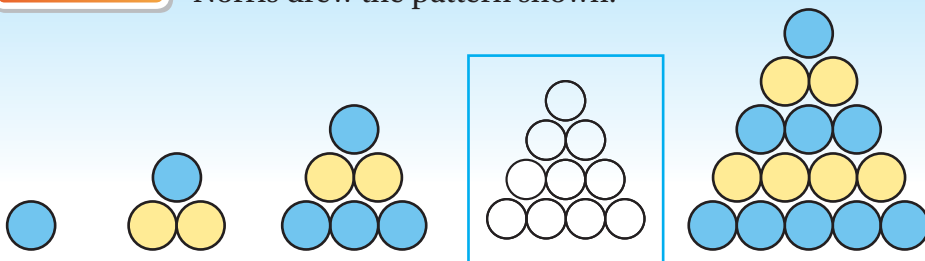
Label the circles to show the colors in the fourth figure of the pattern.

## Problem Solving • Shape Patterns

Solve each problem.

1. Marta is using this pattern to decorate a picture frame.
   Describe the pattern. Draw what might be the next
   three figures in the pattern.

   ◺ ☐ ☐ ◺ ☐ ☐ ◺ ☐ ☐ ◺ ☐ ☐ ◺

   Possible answer: the pattern repeats: one triangle followed by

   two squares.

2. Describe the pattern. Draw what might be the next
   three figures in the pattern. How many circles are
   in the sixth figure in the pattern?

   _____

   _____
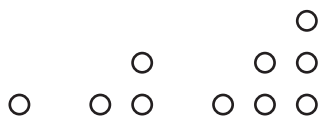
3. **WRITE** ▸*Math* Find a pattern in your classroom. Describe and
   extend the pattern.

   _____

   _____

   _____

Lesson Check

1. Draw what might be the next three figures in this pattern?

⇑⇓⇓⇑⇑⇑⇓⇓⇓⇑⇑⇑⇑⇓⇓⇓⇓

2. Draw what might be the missing figure in the pattern below.

⊗ ⊗ ⊕ ⊕ ___ ⊗ ⊕

Spiral Review (4.OA.B.4, 4.NF.B.3d, 4.NF.B.4a, 4.NF.C.7)

3. Chad has two pieces of wood. One piece is $\frac{7}{12}$ foot long. The second piece is $\frac{5}{12}$ foot longer than the first piece. How long is the second piece?

4. Olivia finished a race in 40.64 seconds. Patty finished the race in 40.39 seconds. Miguel finished the race in 41.44 seconds. Chad finished the race in 40.46 seconds. Who finished the race in the least time?

5. Justin bought 6 ribbons for an art project. Each ribbon is $\frac{1}{4}$ yard long. How many yards of ribbon did Justin buy?

6. Kyle and Andrea were asked to make a list of prime numbers.

Kyle: 1, 3, 7, 19, 23
Andrea: 2, 3, 5, 7, 11

Whose list is correct?

FOR MORE PRACTICE GO TO THE
Personal Math Trainer