



✓ Self-Check: Questions 1-3

Cut out the pieces of the puzzle on the *Mosaic Puzzle* page in the *Student Activity Book*. Use the puzzle pieces to answer Self-Check: Questions 1-3.

- Study the pieces. What can you do with these pieces?
- A. What shape names can you give each piece?
B. What shape name tells the most about each piece?
- Try to put the pieces back together in a large rectangle. Close your book, so you cannot see the puzzle.

Use the following menu to choose the problems you will complete to practice describing and analyzing shapes using their properties.

- Decide if you are "Working On It", you are "Getting It", or you already "Got It" to choose which problems you should complete.
- If one set of problems seems too easy or too hard, choose a different set to complete.

Can I Do This?	Working On It! I could use some extra help.	Getting It! I just need some more practice.	Got It! I'm ready for a challenge.
Describe and analyze shapes using their properties.	★Q# 4-8, 10	●Q# 6-10	■Q# 6-11

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Student Guide - Page 426

Use the *Mosaic Puzzle* pieces from the *Student Activity Book* to answer Questions 4-11. Use the shapes names and numbers. The *Polygon Names* pages in the Reference section may help you.

- ★4. I have three sides. One of my angles is obtuse. Who am I?
- ★5. I have three equal sides. Who am I?
- ★●6. A. I have four sides. I have two pairs of parallel sides. Who am I?
B. Trace the shape that answers this riddle. Use your drawing to show and tell how you know your answer is correct.
- ★●7. I am not a quadrilateral. All of my angles are equal. Who am I?
- ★●8. I am a quadrilateral. All of my angles are equal. Who am I?
- 9. I have four sides. Two sides that meet at an acute angle are equal. Who am I?
- ★●10. How are Shapes 3 and 4 from the Mosaic Puzzle pieces alike? How are they different? Look at the number of sides, length of sides, number of angles, and size of angles. Use drawings and words in your answer.
- 11. How are Shapes 4 and 7 from the Mosaic Puzzle pieces alike? How are they different? Think about their properties. Use drawings and words in your answer.

Use the *Classifying Shapes* pages in the *Student Activity Book* to practice identifying congruent shapes; lines of symmetry; and slides, flips, and turns.

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Student Guide - Page 427

*Answers and/or discussion are included in the lesson.

Student Guide

Workshop: Shapes and Properties

Questions 1-17 (SG pp. 426-446)

- Responses will vary. Students may say they can combine shapes to make other shapes they have, make new shapes, or sort the shapes into groups.
- A.* Responses will vary. Students can use quadrilateral, rectangle, triangle, trapezoid, and parallelogram. For triangles they can use the terms right, obtuse, acute, isosceles, scalene, and equilateral.
B.* Shape 1 - isosceles triangle
Shape 2 - equilateral triangle or regular triangle
Shape 3 - rectangle
Shape 4 - trapezoid
Shapes 5 and 6 - right triangle
Shape 7 - trapezoid

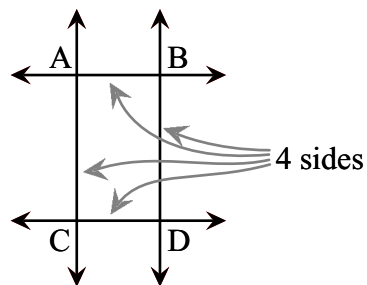
3.* See lesson.

4. 1; isosceles triangle

5. 2; equilateral triangle

6. A. 3; rectangle

B. \overleftrightarrow{AB} is parallel to \overleftrightarrow{CD}
 \overleftrightarrow{AC} is parallel to \overleftrightarrow{BD}



7. 2; equilateral triangle


8. 3; rectangle

9. 7; trapezoid or quadrilateral

10. Possible responses: They both have four sides. Shape 3 has two pairs of parallel sides, but shape 4 has only one. All of shape 3's angles are right angles, while shape 4 has two acute angles and two obtuse angles.

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11. Possible responses: They both have four sides. They both have one pair of parallel sides, so they are both trapezoids. Shape 4 has two pairs of matching angles, Shape 7 has all different angles. They both have two acute and two obtuse angles.
12. Isabel is a hexagon. She has six lines of symmetry and six vertices.
13. A hexagon is more important. It has six lines of symmetry and six vertices, whereas a square has four lines of symmetry and four vertices. The people with more lines of symmetry and vertices are more important.
14. A square has more lines of symmetry than a non-square rectangle.
15. The farmers are all right triangles. They are not important as they have only three vertices, and at most one line of symmetry.
16. Hugo Left is congruent to Izzie Right, as they are reflections, or flips, of each other.
17. Professor Peabody showed that the Lefty and Righty triangles were actually the same shapes, just flipped in two different directions.



Use the Journey to Flatopia story to answer the following questions.

- 12. What kind of shape is Isabel Newton? How many lines of symmetry does she have? How many vertices does she have?
- 13. Who is more important in Flatopia, a hexagon or a square? Why?
- 14. Why is a square considered more important than a non-square rectangle?
- 15. What shape are the farmers in Flatopia? Are they considered important people there? Why or why not?
- 16. Is the farmer named Hugo Left congruent to Izzie Right? Show or tell how you know.
- 17. How did Professor Peabody solve the right triangle feud?

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446 SG • Grade 4 • Unit 9 • Lesson 11 Workshop: Shapes and Properties

Student Guide - Page 446

Name _____ Date _____

Use the nine Power Polygons™ below for Questions 1 and 2.

*1. A. Sort the shapes with four sides into Box A.
Sort the Shapes with one or more right angles into Box B.
Some shapes will go in both boxes. Some will go outside.
Sketch the shapes where they belong. The first one is an example.

B. What is one name for all the shapes in Box A? _____

C. What is one name for all the shapes in both Box A and Box B? _____

D. Is a square also a quadrilateral? Show or tell how you know.

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380 SAB • Grade 4 • Unit 9 • Lesson 11 Workshop: Shapes and Properties

Student Activity Book - Page 380

Name _____ Date _____

Use the nine Power Polygons™ for Question 1 for this question, too.

*●2. A. Sort the shapes with all sides equal into Box A.
Sort the shapes with all angles equal into Box B.
Some shapes will go in both boxes. Some shapes will go outside.
Sketch the shapes where they belong.

B. What is one name for all the shapes in Box A that are not in Box B? _____

C. What is one name for all the shapes in both Box A and Box B? _____

D. Is a square a regular polygon? Show or tell how you know.

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Workshop: Shapes and Properties SAB • Grade 4 • Unit 9 • Lesson 11 381

Student Activity Book - Page 381

*Answers and/or discussion are included in the lesson.

Student Activity Book

Classifying Shapes

Questions 1–5 (SG pp. 380–384)

1. A.

- B. quadrilaterals
 - C. rectangles
 - D. A square has 4 sides, so it is a quadrilateral.
2. A.* See Figure 2 in the lesson. B.* rhombus or parallelogram
- C.* regular polygons
 - D.* A square is a regular polygon. Possible response: Regular polygons have all equal sides and all equal angles. A square has four equal sides and all right angles, so it is a regular polygon.

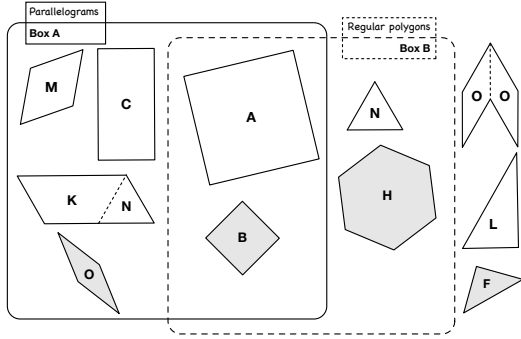
3. A.

	Equilateral	Isosceles	Scalene
Right	None	F	L
Acute	N	N, R	P
Obtuse	None	J	Q

- B. Triangle L is a right scalene triangle. All of its sides are different lengths, so it is scalene. It has a right angle so it is a right triangle. I checked the angles with a corner of my orange square.
- C. I wrote none in the boxes for equilateral right triangle and equilateral obtuse triangle. Equilateral triangles are also regular polygons, so they have all equal angles. All three angles add up to 180 degrees. Because they are all equal, they are all $180 \div 3 = 60$ degrees. So there cannot be a 90 degree angle in an equilateral triangle or an obtuse angle that is greater than 90 degrees.

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4. Students should sketch Polygons O, B, H, and F as shown below.



5. **A.** The brown triangle does not have parallel sides, so it is not a parallelogram and it does not have all equal sides, so it is not a regular polygon. So I put F outside both boxes.
- B.** The yellow hexagon has all equal angles and all equal sides, so it is a regular polygon and I put it in Box B. I didn't put it in Box A because a parallelogram has only 4 sides and the hexagon has six sides.
- C.** All hexagons are not all regular polygons. The shape made from two brown rhombuses (Polygon O) is a hexagon and it is not in Box B because all of the angles are not equal.
- D.** A square is a parallelogram. To be a parallelogram, a shape has to have 4 sides with two pairs of parallel sides. A square has 4 sides and opposite sides are parallel, so it is a parallelogram, too.

Name _____ Date _____

■ 3. You will need seven triangles for this question:

- Cut out the 3 triangles (P, Q, R) at the bottom of the page, and
- Find these 4 triangles (F, J, L, N) in your Power Polygons.

A. Review the names for triangles in Lessons 5 and 9 in the *Student Guide*. Fill in the chart below with the letters of the triangles. Some boxes will not have a letter. Write "none" in those boxes.

Example: Triangle J is both isosceles and obtuse, so write "J" in the row for obtuse and the column for isosceles.

	Equilateral	Isosceles	Scalene
Right			
Acute			
Obtuse		J	

B. Which triangle is a scalene right triangle? Show or tell how you know.

C. In which boxes did you write, "none"? Why are these boxes impossible to fill?

382 SAB • Grade 4 • Unit 9 • Lesson 11 Workshop: Shapes and Properties

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Student Activity Book - Page 382

Name _____ Date _____

◆ ◆ ◆ 4. Sort the following shapes using the same rules as Mrs. Denver's class. Sketch the shapes where they belong on the drawing of the boxes on the previous page. Add their letters.

◆ ◆ ◆ 5. Use your work for Question 4 to answer the questions below. Use properties in your explanations.

A. How did you decide where to place the brown triangle (F)?

B. How did you decide where to place the yellow hexagon (H)?

C. Are all hexagons regular polygons? Show or tell how you know.

D. Is a square also a parallelogram? Show or tell how you know.

Classify the Shapes. Check the box.

MP2: Show my work. I show or tell how I arrived at my answer so someone else can understand my thinking.	Yes ...	Yes, but ...	No, but ...	No ...
Is a square also a parallelogram?				

384 SAB • Grade 4 • Unit 9 • Lesson 11 Workshop: Shapes and Properties

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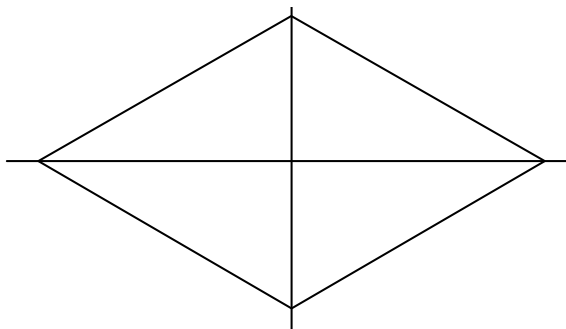
Student Activity Book - Page 384

Student Activity Book

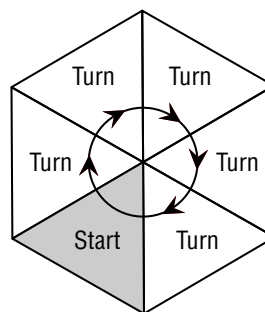
Practice with Shapes and Properties

Questions 1–12 (SAB pp. 385–395)

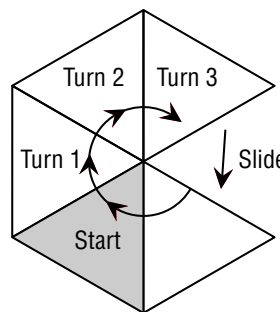
1. Piece J. Possible response: When I put the yellow isosceles triangle over the drawing, it fits perfectly. It is the same size and shape.
2. Two lines of symmetry.



3. A. They are both right. Possible response: I used the green triangle and when I flipped it once from the shaded shape it lands exactly on the white shape. Then I put it on the shaded shape and turned it five times from the corner, and it also landed on the shaded shape.



- B. Possible response: First he made three turns and then he used a slide to move the triangle onto the shaded shape.



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Name _____ Date _____

Practice with Shapes and Properties

✓ **Self-Check: Questions 1-3**

Use the Power Polygon™ pieces to answer Questions 1-3.

1. Which Power Polygon™ piece is congruent to the drawing below? Explain how you decided.

2. Find the lines of symmetry for the following Power Polygon™ (Shape G). Use your ruler to draw the lines of symmetry. How many lines of symmetry did you find?

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Student Activity Book - Page 385

Name _____ Date _____

3. A. Irma said she used a flip to show how the Power Polygon™ (Shape N) moved from the shaded shape to the white shape. Jerome said he used five turns to move from the shaded shape to the white shape. Can they both be right? Explain how you decided.

- B. Luis said he used a combination of turns and slides to move the Power Polygon™ (Shape N) from the shaded shape to the white shape. Describe the moves that he made.

Use the Menu and the Self-Check Questions to choose practice with identifying properties of shapes.

- Look at each row in the menu.
- For each row, decide whether you are "Working On It", you are "Getting It" or you already "Got It".
- On this table, draw a circle around each set of problems you decide to do.
- If one set of problems seems too easy or too hard, choose a different set from the same row.

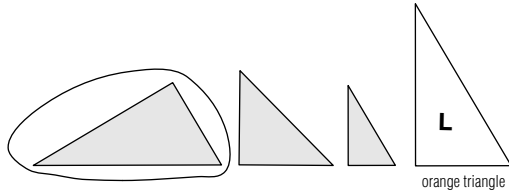
Can I Do This?	Working On It! <small>I could use some extra help.</small>	Getting It! <small>I just need some more practice.</small>	Got It! <small>I'm ready for a challenge.</small>
Identify congruent shapes.	★Q# 4-7	●Q# 5-8	Go to Student Guide Journey to Flatopia ■Q# 12-17
Identify lines of symmetry.	★Q# 9	●Q# 9-10	
Identify slides, flips, and turns of shapes.	★Q# 11	●Q# 12	

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386 SAB • Grade 4 • Unit 9 • Lesson 11 Workshop: Shapes and Properties

Student Activity Book - Page 386

4.



- 5. Shapes 5 and 6 are congruent.
- 6. **A.** Shape 2
- B.** Shapes 5 and 6
- 7. Ming is incorrect.

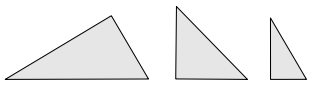

The red trapezoid (Polygon K) is the same shape as the Number 4 puzzle piece, but it is not the same size. If you put the red trapezoid on top of the puzzle piece, they do not match exactly, so they are not congruent.

Name _____ Date _____

Congruent Shapes

Work with a partner. You will need a set of Power Polygons™ and the seven pieces from the *Mosaic Puzzle* in the *Student Activity Book* to answer Questions 4–7.

★ 4. Circle the shaded shape below that is congruent to the orange triangle (Shape L in the Power Polygons). Use the orange triangle from your set.

★ 5. Find two puzzle pieces that are **congruent**. Give the numbers of the two congruent pieces. _____

★ 6. **A.** Give the number of the puzzle piece that is congruent to the blue triangle in your Power Polygon™ set (Polygon I). _____

B. Give the number of the puzzle piece that is congruent to the yellow triangle (Polygon J). _____

★ 7. Ming said, “The red trapezoid is congruent to the Number 4 puzzle piece.” Do you agree with Ming? Why or why not?

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Workshop: Shapes and Properties
SAB • Grade 4 • Unit 9 • Lesson 11 387

Student Activity Book - Page 387

Name _____ Date _____

●8. Use two or more Power Polygons™ to make congruent shapes for the puzzle pieces below. Draw dotted lines on the shapes to show the polygons you used. The first one is an example.

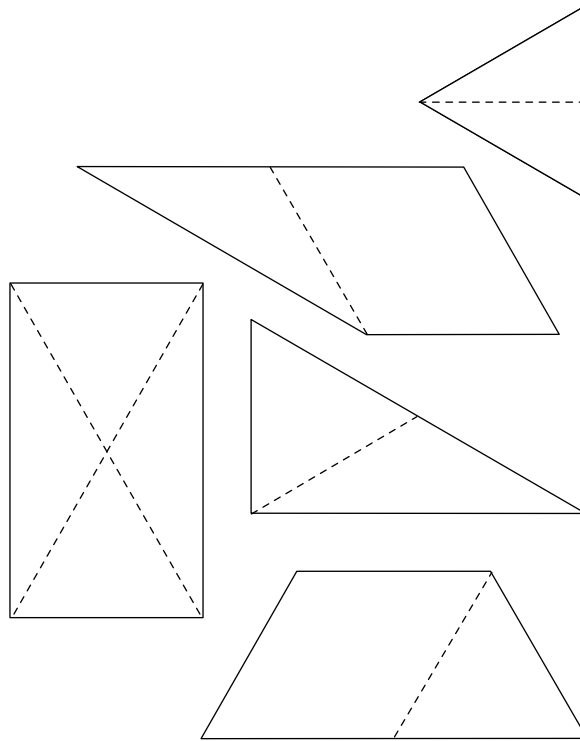
Example:

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388 SAB • Grade 4 • Unit 9 • Lesson 11 Workshop: Shapes and Properties

Student Activity Book - Page 388

8. Responses will vary. One possible response is given for each.



Name _____ Date _____

Lines of Symmetry

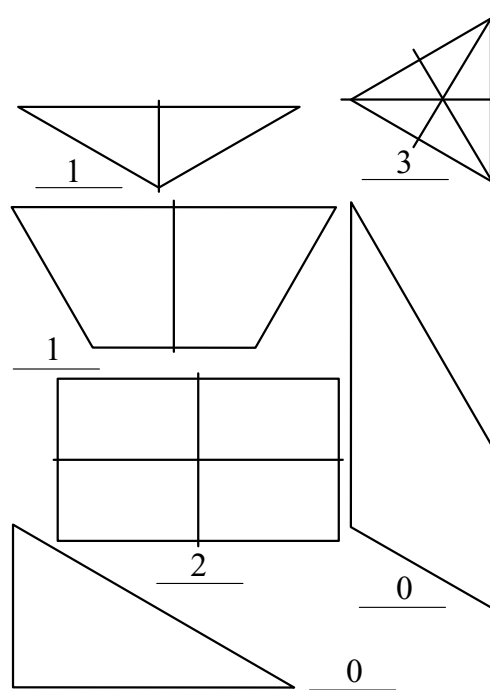
★●9. Fold the Mosaic Puzzle pieces you cut from the *Student Activity Book* pages to find the lines of symmetry for the shapes below. Use a ruler to draw the lines of symmetry on each shape on this page. Write the number of lines of symmetry below each shape.

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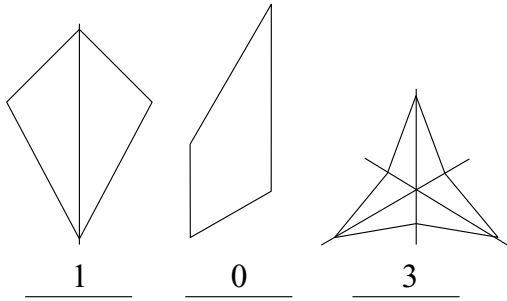
Workshop: Shapes and Properties SAB • Grade 4 • Unit 9 • Lesson 11 389

Student Activity Book - Page 389

9.



10.



11. A. Jerome used a slide 4 times. He moved the hexagon core shape up, then to the right, then up. Other combinations of slides are possible.

B. One possible response is given for each:
 Ana flipped the core triangle over one side 5 times. Keenya rotated the core triangle 6 times around the center point.

12. One possible response: I rotated the shaded fish around his nose and then slid it to match a white fish exactly.

Name _____ Date _____

•10. Cut out the shapes at the bottom of the page on the dotted lines. Fold the shapes to find lines of symmetry. Use a ruler to draw lines of symmetry on the shapes on this page. Write the number of lines of symmetry below each shape.

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Student Activity Book - Page 391

Name _____ Date _____

Slides, Flips, and Turns

*11. Use slides, flips, and turns to describe how the core shapes move.

A. Jerome decided to make a quilt from a core hexagon. How did Jerome move the core hexagon to make the quilt design? Use a yellow hexagon covered by a red trapezoid to help you.

B. Ana and Keenya made different quilt designs from the same core triangle.

Ana's quilt design Keenya's quilt design

Core triangle

Cut out the core triangle. Use it to help you describe how each girl moved the core triangle to make her design.

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Student Activity Book - Page 393

Name _____ Date _____

•12. • Read the Slides, Flips, and Turns in Escher Drawings section in the Student Guide.
 • Cut out the fish to the right on the dotted lines. Place the fish on top of a shaded fish on the drawing below. Use a combination of flips, slides, or turns to move the fish from a shaded fish to a white fish.
 • Describe your moves.

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Student Activity Book - Page 395