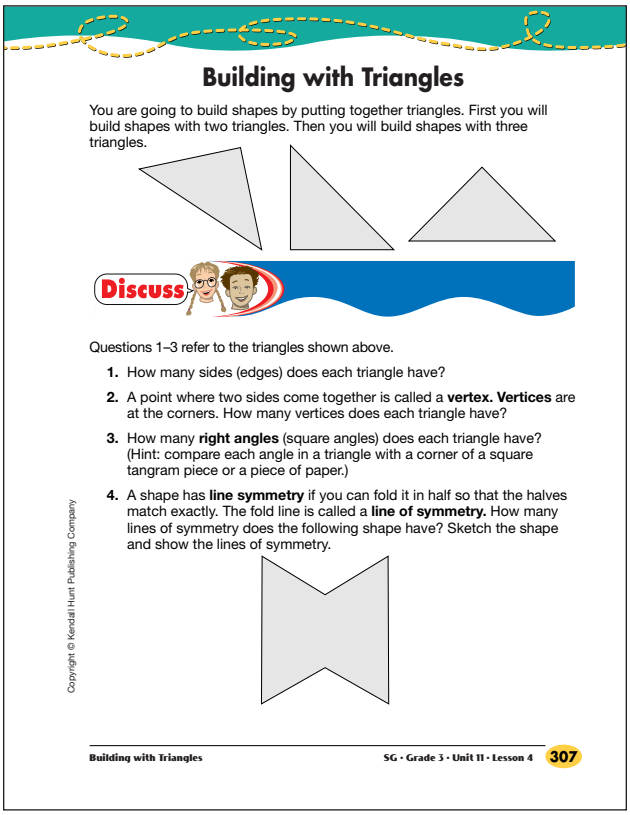


Building with Triangles

You are going to build shapes by putting together triangles. First you will build shapes with two triangles. Then you will build shapes with three triangles.

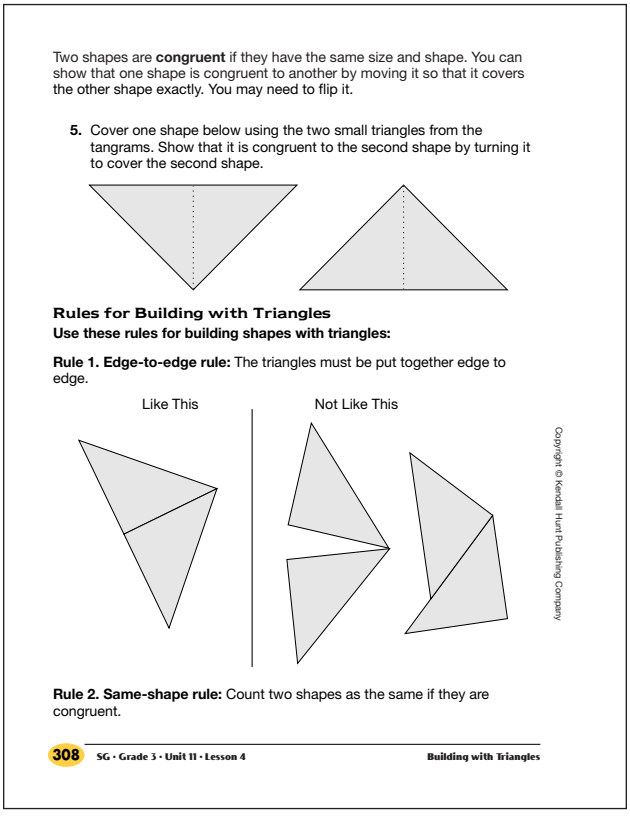
Discuss

Questions 1–3 refer to the triangles shown above.

1. How many sides (edges) does each triangle have?
2. A point where two sides come together is called a **vertex. Vertices** are at the corners. How many vertices does each triangle have?
3. How many **right angles** (square angles) does each triangle have? (Hint: compare each angle in a triangle with a corner of a square tangram piece or a piece of paper.)
4. A shape has **line symmetry** if you can fold it in half so that the halves match exactly. The fold line is called a **line of symmetry.** How many lines of symmetry does the following shape have? Sketch the shape and show the lines of symmetry.

Copyright © Kendall Hunt Publishing Company

***Student Guide* - Page 307**



Two shapes are **congruent** if they have the same size and shape. You can show that one shape is congruent to another by moving it so that it covers the other shape exactly. You may need to flip it.

5. Cover one shape below using the two small triangles from the tangrams. Show that it is congruent to the second shape by turning it to cover the second shape.

Rules for Building with Triangles

Use these rules for building shapes with triangles:

Rule 1. Edge-to-edge rule: The triangles must be put together edge to edge.

Like This | Not Like This

Copyright © Kendall Hunt Publishing Company

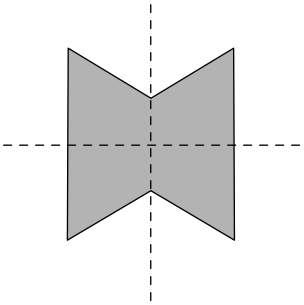
Rule 2. Same-shape rule: Count two shapes as the same if they are congruent.

***Student Guide* - Page 308**

Student Guide

Building with Triangles (SG pp. 307–309)
Questions 1–9

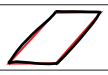
1. 3 sides
2. 3 vertices
3. 1 square corner or right angle
4. Two lines of symmetry



5. Students move triangles as directed.

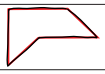
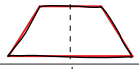
Copyright © Kendall Hunt Publishing Company

6.*

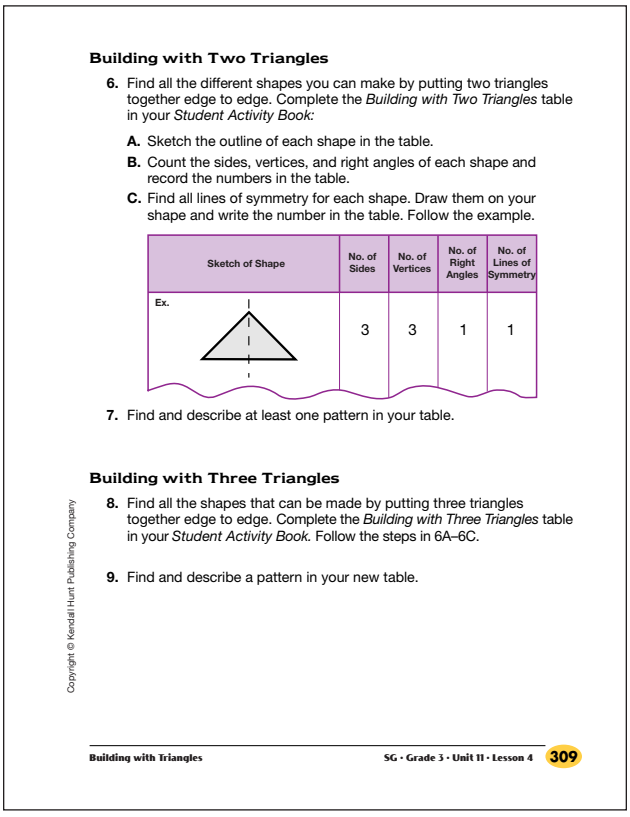
Sketch of Shape	No. of Sides	No. of Vertices	No. of Right Angles	No. of Lines of Symmetry
	4	4	4	4
	3	3	1	1
	4	4	0	0

7.* Answers will vary. May include the fact that the number of vertices always equals the number of sides.

8.*

Sketch of Shape	No. of Sides	No. of Vertices	No. of Right Angles	No. of Lines of Symmetry
	4	4	2	0
	5	5	1	0
	4	4	0	1
	5	5	2	1

9.* Answers will vary.



Building with Two Triangles

6. Find all the different shapes you can make by putting two triangles together edge to edge. Complete the *Building with Two Triangles* table in your *Student Activity Book:*

A. Sketch the outline of each shape in the table.

B. Count the sides, vertices, and right angles of each shape and record the numbers in the table.

C. Find all lines of symmetry for each shape. Draw them on your shape and write the number in the table. Follow the example.

Sketch of Shape	No. of Sides	No. of Vertices	No. of Right Angles	No. of Lines of Symmetry
Ex.	3	3	1	1

7. Find and describe at least one pattern in your table.

Building with Three Triangles

8. Find all the shapes that can be made by putting three triangles together edge to edge. Complete the *Building with Three Triangles* table in your *Student Activity Book.* Follow the steps in 6A–6C.

9. Find and describe a pattern in your new table.

Copyright © Kendall Hunt Publishing Company

***Student Guide* - Page 309**

Copyright © Kendall Hunt Publishing Company

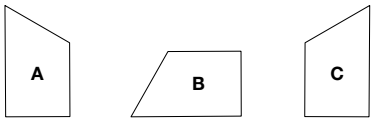
***Answers and/or discussion are included in the lesson.**

Name _____ Date _____

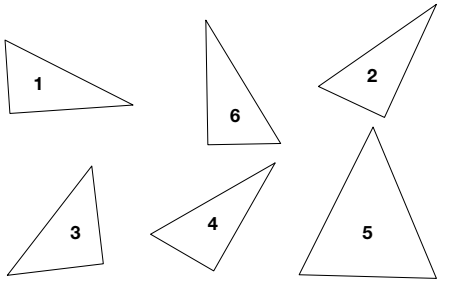
When Are Shapes the Same?

Cut out Shapes Y and Z. Color both sides of each shape.

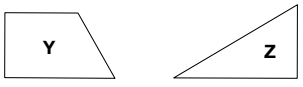
1. Circle shapes congruent to Shape Y.



2. Circle shapes congruent to Shape Z.



color and cut out shapes



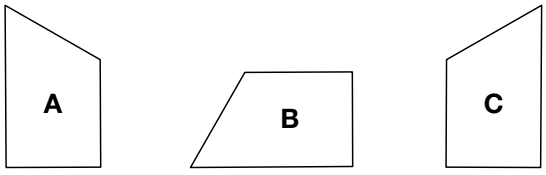
Copyright © Kendall Hunt Publishing Company

Student Activity Book - Page 433

Student Activity Book

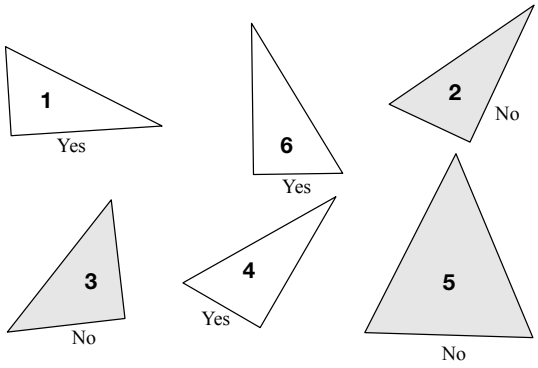
When Are Shapes the Same? (SAB p. 433) Questions 1–2

1.*



Yes Yes Yes

2.*

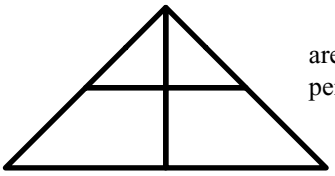


Copyright © Kendall Hunt Publishing Company

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

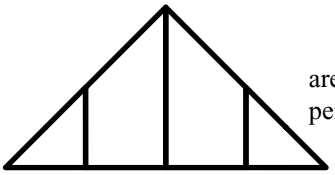
Three to Five Sides (SAB pp. 437–438)
Questions 1–6

1.



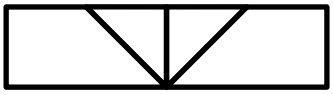
area = 4 square inches
perimeter = 10 inches

or



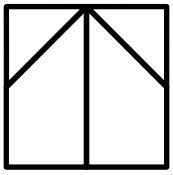
area = 4 square inches
perimeter = 10 inches

2.



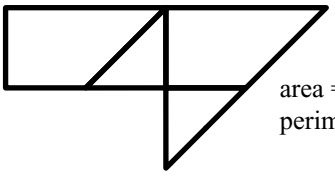
area = 4 square inches
perimeter = 10 inches

or



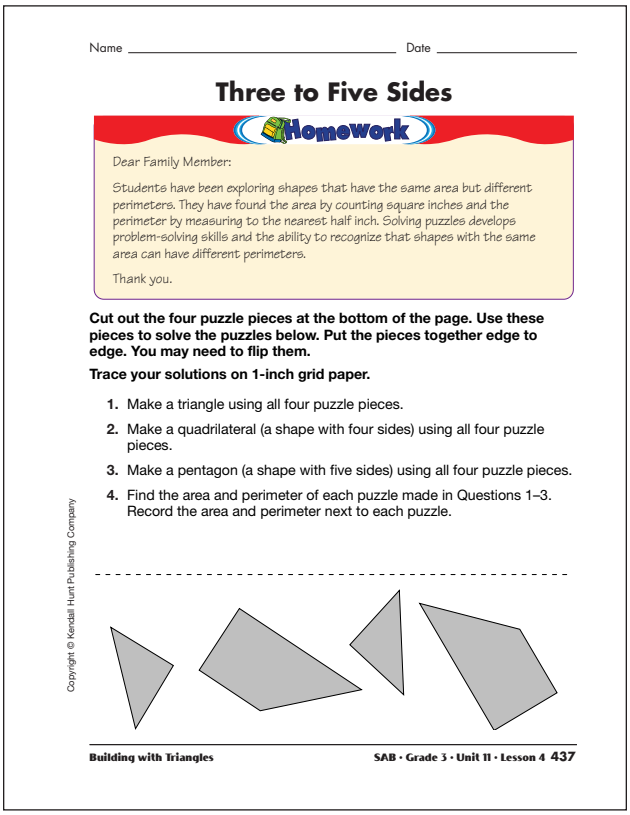
area = 4 square inches
perimeter = 8 inches

3.



area = 4 square inches
perimeter = 11 inches

4. See above for area and perimeter.
5. The area is the same: 4 square inches
6. The perimeter varies from 8–11 inches



Name _____ Date _____

Three to Five Sides

Homework

Dear Family Member:

Students have been exploring shapes that have the same area but different perimeters. They have found the area by counting square inches and the perimeter by measuring to the nearest half inch. Solving puzzles develops problem-solving skills and the ability to recognize that shapes with the same area can have different perimeters.

Thank you.

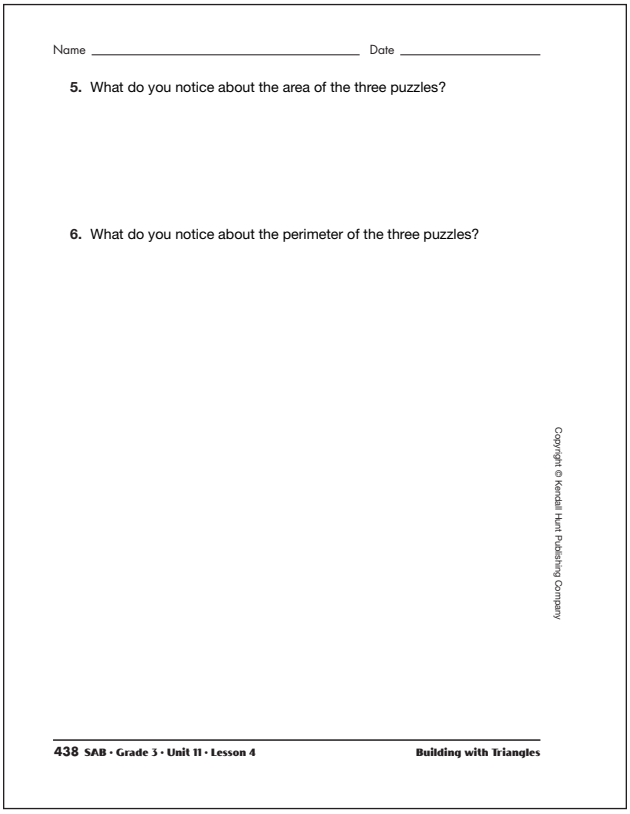
Cut out the four puzzle pieces at the bottom of the page. Use these pieces to solve the puzzles below. Put the pieces together edge to edge. You may need to flip them.

Trace your solutions on 1-inch grid paper.

1. Make a triangle using all four puzzle pieces.
2. Make a quadrilateral (a shape with four sides) using all four puzzle pieces.
3. Make a pentagon (a shape with five sides) using all four puzzle pieces.
4. Find the area and perimeter of each puzzle made in Questions 1–3. Record the area and perimeter next to each puzzle.

Copyright © Kendall Hunt Publishing Company

Student Activity Book - Page 437



Name _____ Date _____

5. What do you notice about the area of the three puzzles?

6. What do you notice about the perimeter of the three puzzles?

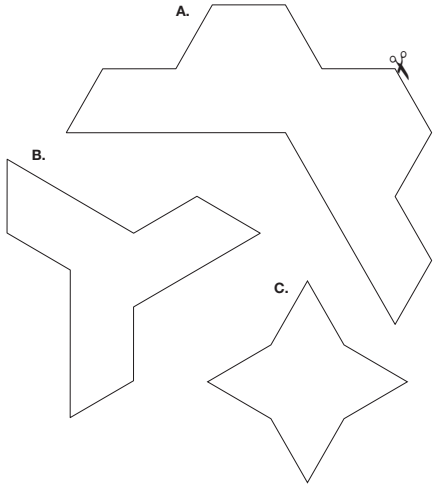
Copyright © Kendall Hunt Publishing Company

Student Activity Book - Page 438

Copyright © Kendall Hunt Publishing Company

Lines of Symmetry

1. Cut out the shapes.
2. Fold the shapes to see if they have any lines of symmetry.
3. Draw the lines of symmetry on each shape.



Copyright © Kendall Hunt Publishing Company

Master

TG • Grade 3 • Unit 11 • Lesson 4

Teacher Guide

Name _____ Date _____

Investigating Shapes

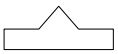
1. Luis and Sam each made a shape with a triangle and a square.

Luis's shape

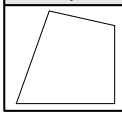
Sam's shape

Sam thinks their shapes are congruent. Luis thinks their two shapes are different. Do you agree with Sam or Luis? Explain your answer.

2. Draw the line(s) of symmetry on this shape.



3. Describe the properties of the shape by completing the table.

Shape	Sides	Vertices	Lines of Symmetry
			

Investigating Shapes Feedback Box	Expectation	Check In	Comments
Describe and analyze two-dimensional shapes using their properties.	E1		
Identify congruent shapes.	E5		
Identify lines of symmetry.	E6		

Copyright © Kendall Hunt Publishing Company

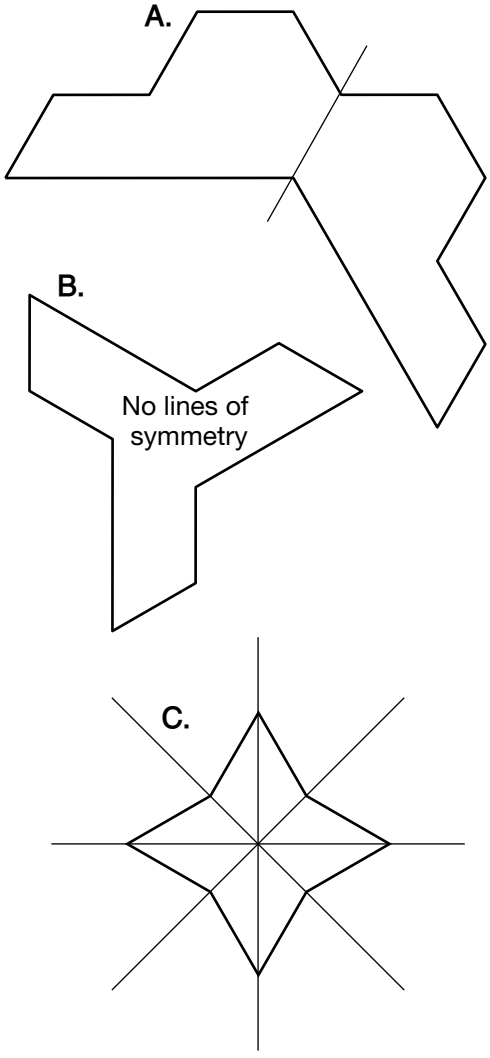
Assessment Master

TG • Grade 3 • Unit 11 • Lesson 4

Teacher Guide

Teacher Guide

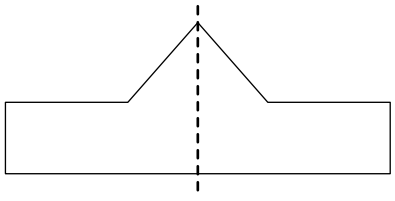
Lines of Symmetry (TG)
Questions A–C



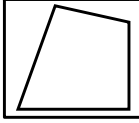
Investigating Shapes (TG)
Questions 1–3

1. Sam is correct. Luis's shape can be turned to fit exactly on top of Sam's shape. They are congruent.

2.



3.

Shape	Sides	Vertices	Lines of Symmetry
	4	4	0

Copyright © Kendall Hunt Publishing Company