

Shape Mosaic Designer

Teacher Guide & Answer Keys

Grade 5 · All levels

Overview

Students design a mosaic for the school entrance. They classify triangles by sides and angles, classify quadrilaterals by their properties, use the shape hierarchy to explain how shapes are related, and describe regular polygons.

Time: 2 class periods · **Product:** Mosaic with Shape Key · **Standards:** 5.G.B.3, 5.G.B.4

Suggested pacing

- Day 1: Introduce the challenge, read the scenario together, and work Parts 1–2 in pairs.
- Day 2: Finish the remaining parts and create the final product.
- Wrap-up: Share products and reflect on strategies.

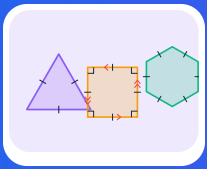
Levels

- **Remedial:** smaller numbers, fewer steps, more structure.
- **Standard:** grade-level numbers and the full set of tasks.
- **Advanced:** harder numbers, extra reasoning and multi-step questions.

All three levels practice the same learning goals, so the class can share and compare work.

Rubric

Category	4 Excellent	3 Good	2 Developing	1 Beginning
Math accuracy	All answers correct	Most answers correct	Some answers correct	Few answers correct
Shows work	Clear work for every step	Work for most steps	Some work shown	Little work shown
Explains thinking	Clear, complete explanations	Mostly clear explanations	Some explanation	Little explanation
Final product	Complete, neat and creative	Complete and neat	Partly complete	Not complete



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Answer key · Remedial KEY

Part 1: Triangle Tiles

1. Triangle A: all three sides 5 cm; angles 60°, 60°, 60°
equilateral acute

2. Triangle B: exactly two sides equal; angles 70°, 70°, 40°
isosceles acute

3. Triangle C: no sides equal; angles 90°, 40°, 50°
scalene right

Part 2: Four-Sided Tiles

4. Tile 1: 4 equal sides, 4 right angles
square

5. Tile 2: 2 pairs of parallel sides, 4 right angles, sides 6 and 3
rectangle

6. Tile 3: 4 equal sides, no right angles
rhombus

7. Tile 4: exactly 1 pair of parallel sides
trapezoid

Part 3: Family Tree

8. Is every square a rectangle? Explain.
Yes. A square has 4 right angles and 2 pairs of parallel sides.

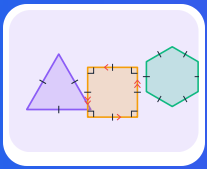
9. Is every rectangle a square? Explain.
No. A rectangle's sides do not all have to be equal.

Part 4: Mosaic Design

10. Shape key:
Answers vary; names must match properties.

Extension

7 cm; obtuse (120°)



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Answer key · Standard KEY

Part 1: Triangle Tiles

1. Triangle A: all three sides 5 cm; angles 60°, 60°, 60°
equilateral acute

2. Triangle B: exactly two sides equal; angles 70°, 70°, 40°
isosceles acute

3. Triangle C: no sides equal; angles 90°, 40°, 50°
scalene right

4. Triangle D: exactly two sides equal; angles 30°, 30°, 120°
isosceles obtuse

Part 2: Four-Sided Tiles

5. Tile 1: 4 equal sides, 4 right angles
square

6. Tile 2: 2 pairs of parallel sides, 4 right angles, sides 6 and 3
rectangle

7. Tile 3: 4 equal sides, no right angles
rhombus

8. Tile 4: exactly 1 pair of parallel sides
trapezoid

Part 3: Family Tree

9. Is every square a rectangle? Explain.
Yes. A square has 4 right angles and 2 pairs of parallel sides.

10. Is every rectangle a square? Explain.
No. A rectangle's sides do not all have to be equal.

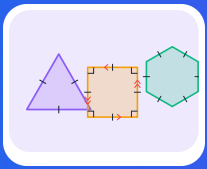
11. Name every category a square belongs to.
square, rectangle, rhombus, parallelogram, trapezoid (inclusive), quadrilateral, polygon

Part 4: Mosaic Design

12. Shape key:
Answers vary; names must match properties.

Extension

7 cm; obtuse (120°)



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Grade 5 · All levels

Answer key · Advanced KEY

Part 1: Triangle Tiles

1. Triangle A: all three sides 5 cm; angles 60°, 60°, 60°
equilateral acute

2. Triangle B: exactly two sides equal; angles 70°, 70°, 40°
isosceles acute

3. Triangle C: no sides equal; angles 90°, 40°, 50°
scalene right

4. Triangle D: exactly two sides equal; angles 30°, 30°, 120°
isosceles obtuse

Part 2: Four-Sided Tiles

5. Tile 1: 4 equal sides, 4 right angles
square

6. Tile 2: 2 pairs of parallel sides, 4 right angles, sides 6 and 3
rectangle

7. Tile 3: 4 equal sides, no right angles
rhombus

8. Tile 4: exactly 1 pair of parallel sides
trapezoid

Part 3: Family Tree

9. Is every square a rectangle? Explain.
Yes. A square has 4 right angles and 2 pairs of parallel sides.

10. Is every rectangle a square? Explain.
No. A rectangle's sides do not all have to be equal.

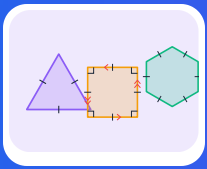
11. Name every category a square belongs to.
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Part 4: Mosaic Design

12. Shape key:
Answers vary; names must match properties.

Extension

7 cm; obtuse (120°)



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Worked teacher example (Standard, Part 1)

Triangle A: all three sides 5 cm; angles 60°, 60°, 60°
equilateral acute

Triangle B: exactly two sides equal; angles 70°, 70°, 40°
isosceles acute

Triangle C: no sides equal; angles 90°, 40°, 50°
scalene right

Triangle D: exactly two sides equal; angles 30°, 30°, 120°
isosceles obtuse

Model the first part aloud: read the situation, name the operation, estimate, solve, and check. Then let partners try Part 2.

Look for

- Students use correct notation and units in every answer.
- Students explain why an answer is reasonable (estimates, benchmarks, pictures).
- Final products show the math clearly, not just the answers.