

# Grade 6 • Unit 1 Worksheet

## Area and Surface Area

Name: \_\_\_\_\_

Date: \_\_\_\_\_

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### Part A • Reasoning About Area

*Areas of figures by decomposing and rearranging — show your strategy.*

1. A parallelogram has a base of 12 cm and a corresponding height of 7 cm. A second parallelogram has a base of 14 cm and a corresponding height of 6 cm. Are their areas equal? Find each area and explain your reasoning.

Area of first parallelogram:

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Area of second parallelogram:

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Compare and explain:

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2. Find the area of a triangle with base 9 in and height 8 in. Then explain in words why the formula  $A = (1/2) \times \text{base} \times \text{height}$  makes sense, by relating a triangle to a parallelogram.

Area: \_\_\_\_\_ sq in

Why the formula works:

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### Part B • Multi-Step Area

3. A floor plan shows an L-shaped room formed by joining a 12 ft  $\times$  8 ft rectangle to a 5 ft  $\times$  6 ft rectangle along one edge. Find the area in TWO different ways: (a) decomposing into simpler shapes and (b) finding the area of a larger rectangle and subtracting the missing piece.

Way 1 (decompose and add):

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Way 2 (subtract from a larger rectangle):

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Which way did you find more efficient? Why?

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4. A triangle has area 36 square cm and a base of 8 cm. What is its height? Write an equation and solve.

Height = \_\_\_\_\_ cm

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### Part C • Surface Area & Nets

5. A rectangular prism (box) has dimensions 4 in by 5 in by 3 in.

a. Sketch a net for the prism. Label each face with its dimensions.

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b. Find the surface area:

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c. Find the volume:

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d. Surface area is measured in \_\_\_\_\_ units; volume is measured in \_\_\_\_\_ units.

6. A cube has edge length 5 cm.

a. Write an expression for the surface area using an exponent: \_\_\_\_\_

b. Evaluate it. Surface area = \_\_\_\_\_ sq cm

c. Write an expression for the volume using an exponent: \_\_\_\_\_

d. Evaluate it. Volume = \_\_\_\_\_ cubic cm

### Part D • Error Analysis & Reasoning

7. Andre says that the area of a triangle with base 10 cm and a slanted side of 12 cm is  $(1/2)(10)(12) = 60$  sq cm. Is Andre correct?

☐ Yes   ☐ No

Explain the error or confirm the reasoning:

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8. A parallelogram has two different base-height pairs. One pair is base 10, height 6. Could the other pair be base 12 with some height  $h$ ? If so, find  $h$ .

Reasoning:

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Answer:  $h =$  \_\_\_\_\_

## Part E • Thinking Deeply

9. A cube has a surface area of 96 square inches. What is the edge length? What is the volume? Show how you found each.

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10. A triangular tent has 2 triangular faces (base 6 ft, height 4 ft each) and 3 rectangular faces. Two of the rectangles are 6 ft  $\times$  8 ft (the floor and one side) and the third side is 5 ft  $\times$  8 ft. Estimate the total amount of fabric needed if the floor is NOT included.

Show your work:

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Answer: \_\_\_\_\_ sq ft

11. Reflect: When does it make sense to use a formula versus decomposing into smaller shapes? Give an example of each.

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