5th Grade: Unit 1

Unit 1 Assessment Overview

AKS
5MA.D.8 examine properties of polygons (e.g., triangles, quadrilaterals including kites, trapezoids, rectangles, squares, rhombuses, other parallelograms, pentagons, hexagons, octagons) and rectangular prisms; classify polygons by their properties; discover volume of right rectangular prisms (5.GSR.8) **5MA.A.5** write, interpret, and evaluate numerical expressions within real-life problems (5.NR.5)

| IOA	Items
8.c investigate volume of right rectangular prisms by packing them with unit cubes without gaps or overlaps; determine the total volume to solve problems (5.GSR.8.3)	1, 3, 9, 11
8.d discover and explain how the volume of a right rectangular prism can be found by multiplying the area of the base times the height to solve authentic, mathematical problems (5.GSR.8.4)	2, 4, 5, 6, 7, 8, 10, 11
5.a write, interpret, and evaluate simple (up to two operations) numerical expressions involving whole numbers with or without grouping symbols to represent actual situations (5.NR.5.1a)	5, 11

Name: _____   Date: _____

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1. **Use the image to answer the following question.**

   How many more cubes are needed to fill the packing box?
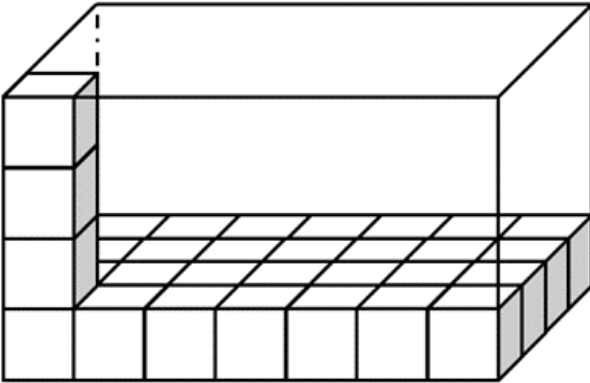
2. **You are designing a toy box that needs to be able to hold 30 cubic meters of toys. What might the dimensions be?**
   - A. 3 m × 10 m
   - B. 2 m × 3 m × 5 m
   - C. 5 m × 5 m × 5 m × 5 m
   - D. 10 m × 10 m × 10 m

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3. **How many 1-inch cubes are needed to fill a box that is 15 inches long, 3 inches wide, and 9 inches high? Explain your answer.**

4. Jennifer is designing a dollhouse. The bottom floor of the dollhouse is shown.

First floor

Height

Width

Length
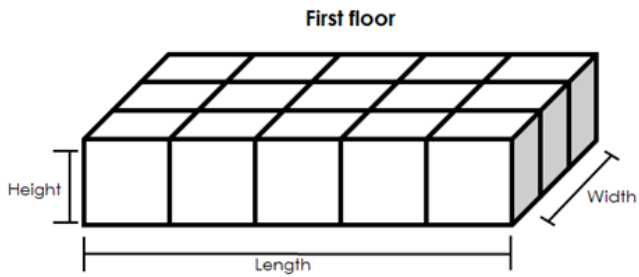
If Jennifer wants the dollhouse to have a volume of 75 cubic inches, how many layers, exactly like the first floor, will she need to add to get to the needed volume? Show your work.
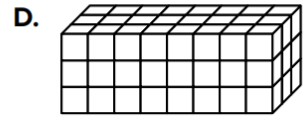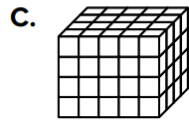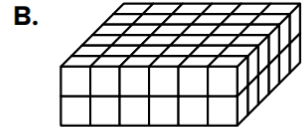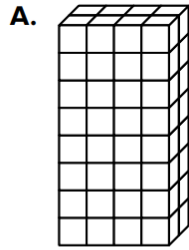
5. A Toy Company packs cubic blocks into packages. Each package is shaped like the figure shown.

Write an expression to determine the volume of the package. Find the total volume of the package.
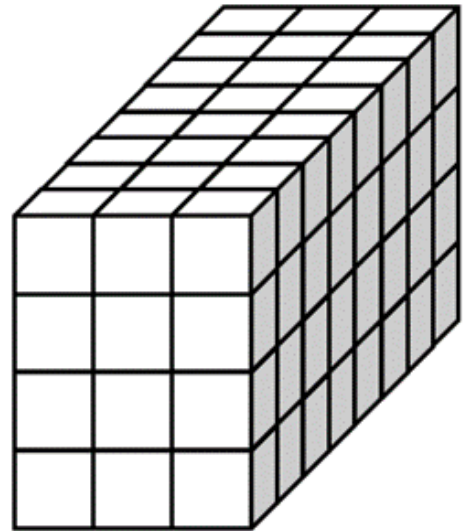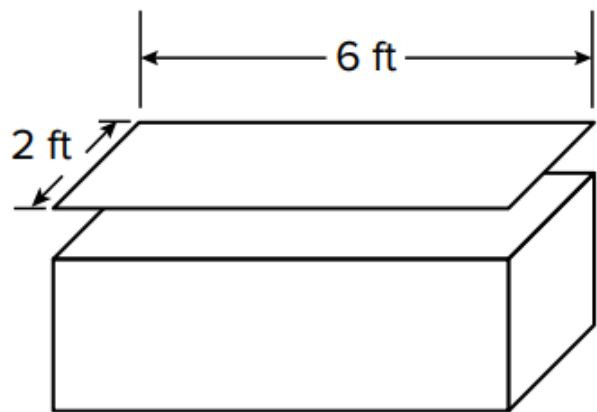
6. Which rectangular prisms have a volume of 72 cubic units? Choose all that apply.
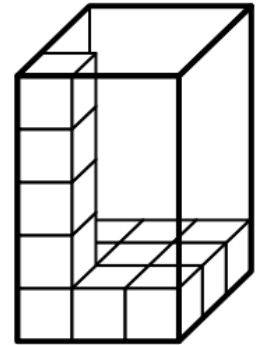
A.

B.

C.

D.

7. Lydia's school box is 10 inches long, 8 inches wide, and 4 inches high. What is the volume of the school box?

8. A toy chest has a volume of 48 cubic feet. How tall is the toy chest?

6 ft

2 ft

9. Seth partially fills a rectangular prism with unit cubes, as shown. What is the volume of the rectangular prism?
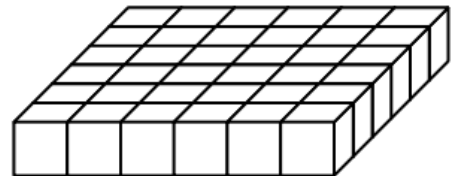
10. Janelle and Robert each build a figure using centimeter cubes.

Janelle says her figure has greater volume than Robert's figure because it is taller. Is Janelle correct? Explain your thinking.
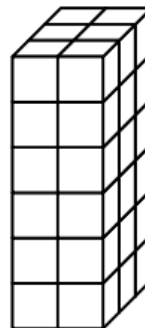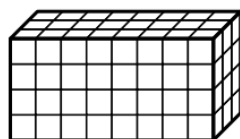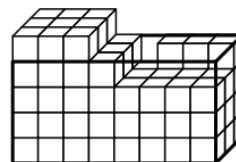
Janelle's figure

Robert's figure

11. A fifth grade class went on a field trip to Fernbank Science Center. At the first station, the students filled different containers with plastic cubes.
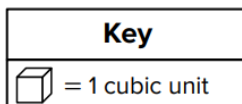
Jake and Marty both fill the same size container.

Jake

Marty

Key
☐ = 1 cubic unit

Part A: Which arrangement of cubes makes it easier to calculate the volume? Explain your thinking.

Why is the second arrangement the same volume but not the same shape?

Part B: At the next station, students can fill their own box with sand to perform an experiment. The box measures 3 inches wide, 2 inches long, and 5 inches high. If Danielle already has 10 cubic inches of soil in her box, how much more does she need to fill her box? Show your work and explain your thinking.

Part C: At the last station, a display case in the shape of a box is shown that has a volume of 100 cubic meters. Write 2 different expressions for the possible dimensions that would each result in a total volume of 100 cubic meters.

Expression #1:

Expression #2: