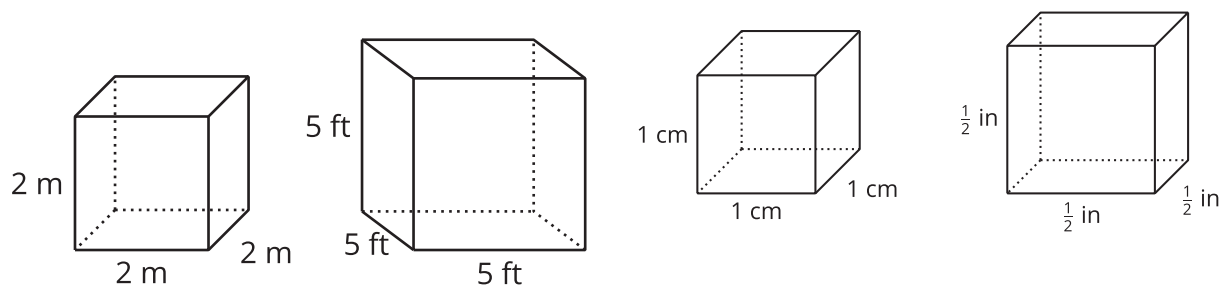


Unit 5 Lesson 6: Scaling Solids

1 Math Talk: Cube Volumes (Warm up)

Student Task Statement



Find the volume of each cube mentally.

2 How Do Surface Area and Volume Change with Scaling?

Student Task Statement

1. Use unit cubes to build cubes that result from dilating a unit cube by each scale factor shown in the table. Then, complete the table with the surface area and volume of each dilated cube.

scale factor	surface area in square units	volume in cubic units
1		
2		
3		
4		

2. Suppose a unit cube is dilated by some scale factor k .
 - a. Write an expression for the surface area of the dilated cube.
 - b. Write an expression for the volume of the dilated cube.
 - c. Compare and contrast the expression for surface area and the expression for volume.

3 Scaling All Solids

Student Task Statement

Clare says, “We know that if we dilate a cube by a factor of k , the cube’s volume is multiplied by k^3 . It seems like that must apply to *all* solids, but I’m not sure how to prove it.”

Elena says, “Earlier in the unit, we showed that we can cover any two-dimensional shape with rectangles, so the property that area changes by k^2 when we dilate a figure by k applies to all shapes, not just rectangles. Can we do something similar here?”

1. Use Elena’s line of reasoning to argue that for *any* solid, if it’s dilated by a factor of k , the volume is multiplied by k^3 .
2. Suppose a triangular prism has surface area 84 square centimeters and volume 36 cubic centimeters. The prism is dilated by scale factor $k = 4$. Calculate the surface area and volume of the dilated prism.

Images for Activity Synthesis

