Name _____

Problem Solving • Compare Volumes

Essential Question: How can you use the strategy *make a table* to compare different rectangular prisms with the same volume?

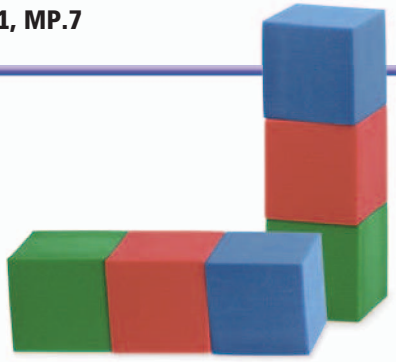
Measurement and Data—5.MD.5b

MATHEMATICAL PRACTICES
MP.1, MP.7

Unlock the Problem

Adam has 50 one-inch cubes. The cubes measure 1 inch on each edge. Adam wonders how many rectangular prisms, each with a different-size base, that he could make with all of the one-inch cubes.

Use the graphic organizer below to help you solve the problem.



Read the Problem

What do I need to find?

I need to find the number of _____,

each with a different-size _____, that have

a volume of _____.

What information do I need to use?

I can use the formula _____

_____ and the factors of _____.

How will I use the information?

I will use the formula and the factors of

50 in a _____ that shows all of the possible combinations of dimensions with a

volume of _____ without repeating the dimensions of the bases.

Solve the Problem

Complete the table.

Base (sq in.)	Height (in.)	Volume (cu in.)
(1 × 1)	50	(1 × 1) × 50 = 50
(1 × 2)	25	(1 × 2) × 25 = 50
(1 × 5)	10	(1 × 5) × 10 = 50
(1 × 10)	5	(1 × 10) × 5 = 50
(1 × 25)	2	(1 × 25) × 2 = 50
(1 × 50)	1	(1 × 50) × 1 = 50

1. MATHEMATICAL PRACTICE 1 **Evaluate** What else do you need to do to solve the problem? _____

_____

2. How many rectangular prisms with different bases can Adam make using 50 one-inch cubes? _____

Try Another Problem

Mrs. Wilton is planning a rectangular flower box for her front window. She wants the flower box to hold exactly 16 cubic feet of soil. How many different flower boxes, all with whole-number dimensions and a different-size base, will hold exactly 16 cubic feet of soil?

Use the graphic organizer below to help you solve the problem.

Read the Problem	Solve the Problem
What do I need to find?	
What information do I need to use?	
How will I use the information?	

Math Talk **Mathematical Practices**

Explain how a flower box with dimensions of $(1 \times 2) \times 8$ is different from a flower box with dimensions of $(2 \times 8) \times 1$.

3. How many flower boxes with different-size bases will hold exactly 16 cubic feet of soil, using whole-number dimensions?

_____

Name _____

Share and Show

1. A company makes concrete paving stones in different sizes. Each stone has a volume of 360 cubic inches and a height of 3 inches. The stones have different lengths and widths. No stones have a length or width of 1 or 2 inches. How many different paving stones, each with a different-size base, have a volume of 360 cubic inches?

First, think about what the problem is asking you to solve, and the information that you are given.

Next, make a table using the information from the problem.

Finally, use the table to solve the problem.

2. What if the 360 cubic-inch paving stones are 4 inches thick and any whole number length and width are possible? How many different paving stones could be made? Suppose that the cost of a paving stone is $2.50, plus $0.18 for every 4 cubic inches of concrete. How much would each paving stone cost?

3. One company makes inflatable swimming pools that come in four sizes of rectangular prisms. The length of each pool is twice the width and twice the depth. The depth of the pools are each a whole number from 2 to 5 feet. If the pools are filled all the way to the top, what is the volume of each pool?

Unlock the Problem

- Use the Problem Solving MathBoard.
- Underline important facts.
- Choose a strategy you know.

WRITE Math • Show Your Work