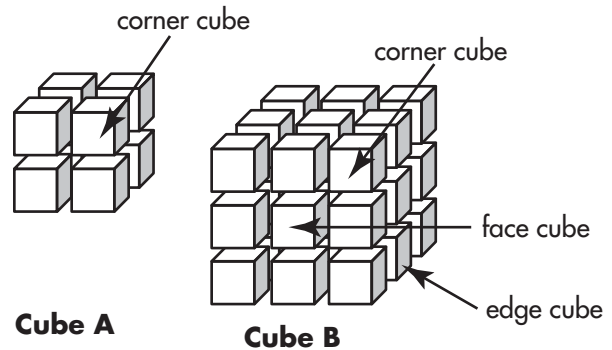


Problem Solving: Use Objects and Solve a Simpler Problem

At a math fair, Willie saw a puzzle about a giant cube made of smaller identical white cubes. The giant cube was $4 \times 4 \times 4$. It contained 64 smaller cubes. Each of the six faces of the giant cube was painted red. The puzzle asked, "If the giant cube were taken apart, how many smaller cubes would have only one face painted red?" Here is how Willie tried to solve the puzzle.

- Construct Cube A using 8 smaller cubes and Cube B using 27 smaller cubes. Imagine painting Cubes A and B.
- Classify the smaller cubes. *Think: Where are the cubes located in the Cubes A and B? How are they painted differently from each other?* Make a table to organize the data.



Location	Cube A		Cube B	
	Number	Painted Faces	Number	Painted Faces
Corner	8	3	8	
Edge	none		12	
Face	none		6	
Center	none		1	

Willie organized the data about the 64 smaller cubes in the giant cube. Use the table above to complete the table below. One set of data has already been completed.

Giant Cube		
Painted Faces	Location	Number
3	Corner (<i>Think: Same as a $3 \times 3 \times 3$.</i>)	8
2	Edge (<i>Think: One more than a $3 \times 3 \times 3$ on each edge.</i>)	
1	Face (<i>Think: Three more than a $3 \times 3 \times 3$ on each face.</i>)	
0	Center (<i>Think: The center is now $2 \times 2 \times 2$.</i>)	

Name _____

Problem Solving: Use Objects and Solve a Simpler Problem

Use objects to help you solve a simpler problem. Use the solution to help you solve the original problem.

1. Six people can be seated at a table. If two tables are put together, 10 people can be seated. How many tables are needed to make a long table that will seat 22 people?
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2. A large cube has 5 layers, each with 5 rows of 5 small cubes. How many small cubes will the larger cube contain?
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3. There are 5 kinds of fish that Jerome feeds: guppies, zebra danios, bettas, platys, and neon tetras. Use the following clues to find the order in which Jerome feeds them.

- Jerome feeds the guppies third.
- Jerome does not feed the bettas right before or right after the guppies.
- Jerome feeds the zebra danios last.
- Jerome feeds the platys after the bettas.

A Guppies, zebra danios, bettas, platys, and neon tetras

B Bettas, platys, guppies, neon tetras, zebra danios

C Neon tetras, zebra danios, guppies, platys, bettas

D Bettas, guppies, platys, neon tetras, zebra danios

4. Suppose Ann is placing bowling pins in the following manner: 1 pin in the first row, 2 pins in the second row, 3 pins in the third row, and so on. How many pins will she use if she has 5 rows in her placement? Explain.
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