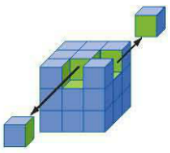
Visual Learning Animation
www.pearsonsuccessnet.com or CD

How many cubes have paint on at least 1 face? Explain. [26; there are 27 cubes in all, but the cube in the center of the large cube has no paint on it because one cube is glued to each of its 6 faces.]

How many cubes have paint on 2 faces?
Only 1 cube on each of the 12 edges of the larger cube has paint on 2 faces.



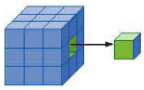
Twelve of these cubes have paint on 2 faces.

How many cubes have paint on 3 faces? [8] *Which cubes are they?* [The corner cubes]

Prevent Misconceptions
Some students may struggle with visualizing the cubes. Allow these students to build their own models using the unit cubes.

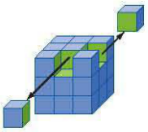
Plan and Solve

How many cubes have paint on 1 face?
The center cube on each of the 6 faces of the larger cube has paint on 1 face.



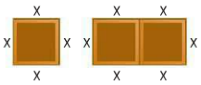
Six of these cubes have paint on 1 face.

How many cubes have paint on 2 faces?
Only 1 cube on each of the 12 edges of the larger cube has paint on 2 faces.

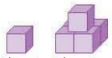


Twelve of these cubes have paint on 2 faces.

5. Four people can be seated at a table. If two tables are put together, six people can be seated. How many tables are needed to make a long table that will seat 20 people?
9 tables



6. Jeremiah wants to make a display of CD boxes. He wants a single box on the top layer. Layers that are below the top layer must form a square, with each layer being 1 box wider than the layer above it. The display can only be 4 layers high. How many total boxes will be in the display? Use cubes.
30 boxes



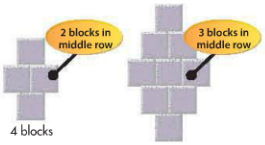
1 layer, 1 cube 2 layers, 5 cubes

7. Katherine is constructing a patio using the design shown at the right.

a How many total blocks will she need in order to have 5 blocks in the middle row?
25 blocks

b How many total blocks will she need in order to have 6 blocks in the middle row?
36 blocks

c What do you notice about the number of blocks in the middle row compared to the total number of blocks? **The total number equals the number in the middle row multiplied by itself.**



4 blocks 9 blocks

8. An artist wants to cut 1 flat sheet of copper into 16 equal pieces. Before he cuts, he will draw segments on the sheet of copper showing where to make the cuts. How many horizontal and vertical segments will he need to draw?
3 vertical and 3 horizontal

9. There are 24 balls in a large bin. Two out of every three are basketballs. The rest are footballs. How many basketballs are in the bin?
16 basketballs

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Exercise	Content
4	Act It Out; Look for a Pattern
5	Act It Out; Look for a Pattern
6	Act It Out; Look for a Pattern
7a	Act It Out; Look for a Pattern
7b	Act It Out; Use a Pattern
7c	Use Logical Reasoning
8	Draw a Picture; Use Logical Reasoning
9	Multiply Fractions and Whole Numbers

Students use underlying processes and mathematical tools for Exercises 4–9. Remind students to check for reasonableness when solving each problem.

Exercise 5
Problem-Solving Skill: Plan and Solve Students can plan how to solve a problem and alter their plan when necessary. *How can you find out how many people can sit at 3 tables?* [Draw a picture or count the sides on a model.] *How many people can sit at 3 tables?* [8] *Why are 2 seats added instead of 4?* [If you think of adding a table between the two tables, then only 2 sides of the table are available for a person to be seated.] Some students may notice that the number of people who can be seated is equal to two times the number of tables plus 2 (the end seats).

Exercise 7c
Problem-Solving Strategy: Use Logical Reasoning *When there are 5 blocks in the middle, what is the answer?* [25] *How are 5 and 25 related?* [5 squared is 25.] *Is 6 squared equal to 36?* [Yes; 6 squared is 36.]