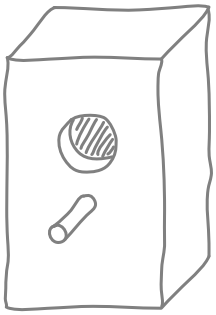
Name _____

Practice Video Tools Games

Additional Practice 11-5
Use Appropriate Tools

Another Look!

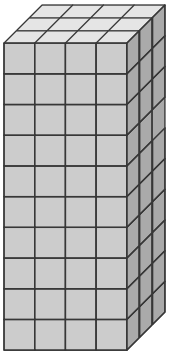
Francine is designing a small birdhouse shaped like a rectangular prism. It needs to have a volume of 120 cubic inches. She wants the height to be 10 inches. What could the length and width of the floor be?



10 in.

One Way

Build a model with cubes. Since the volume is 120 cubic inches, use 120 cubes.

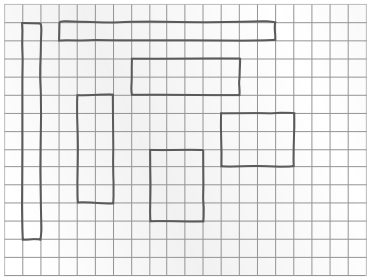


So, one possibility is that the length is 4 inches and the width is 3 inches.

Another Way

Use grid paper to design the floor.

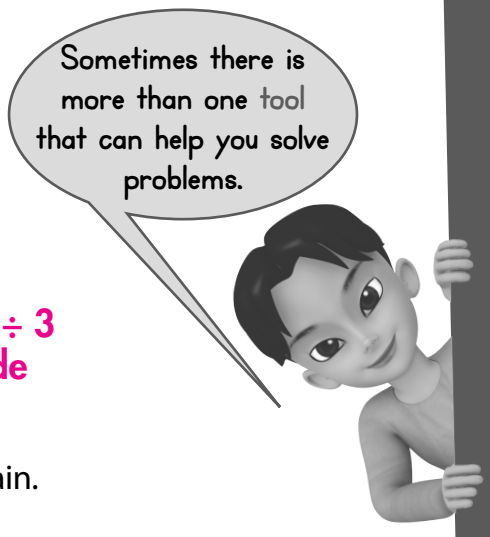
The height is 10 inches, so the area of the floor is 120 ÷ 10 = 12. Use grid paper to draw some possible floors with an area of 12 square inches.



One possibility is that the length is 4 inches and the width is 3 inches.

Use Appropriate Tools

An architect is designing different vacation cottages that are shaped like rectangular prisms that are side-by-side.



1. The height of one cottage will be 3 meters, and the volume will be 108 cubic meters. What tool can help you find different dimensions for the floor? Give two different possible pairs of dimensions for the floor. Explain.

   Sample answer: Grid paper; The area of the floor is 108 ÷ 3 = 36 m^2. If each grid square represents 1 m^2, I can shade 36 squares in different ways such as 4 × 9 and 6 × 6.

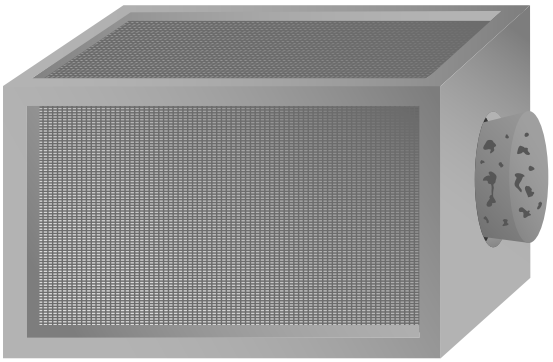
2. Can you think of a different tool to use to solve this problem? Explain.

   Sample answer: I can use 108 cubes to build different rectangular prisms that are 3 cubes tall. Then I can count how many cubes are used for the length and width.

Performance Task

Making a Bug Barn

Wendy is going to use screening and wood to make a bug barn for her little sister. It will have the shape of a rectangular prism. Wendy thinks it will take about 2 hours to make the bug barn.



Sample answers are given in 3–5.

3. **Use Appropriate Tools** What tools might Wendy use?

Ruler, grid paper, saw

4. **Reasoning** Wendy wants the volume to be 80 cubic inches. What dimensions could the bug barn have?

5 in. long, 4 in. wide, 4 in. tall

5. **Reasoning** Wendy decides that 80 cubic inches is too small. So she plans on building a barn with a volume of 108 cubic inches. What dimensions could this bug barn have?

6 in. long, 6 in. wide, 3 in. tall

6. **Make Sense and Persevere** Wendy searches the Internet and finds a bug barn that is 7 inches long, 4 inches wide, and 3 inches tall. If she wants to build a bug barn with volume greater than this, would either of the above barns work? Explain.

Yes; The larger bug barn would work. The volume of the bug barn Wendy found on the Internet is $7 \times 4 \times 3 = 84$ cubic inches. The larger bug barn above has a volume of 108 cubic inches.

7. **Critique Reasoning** Wendy thinks that if she doubles all of the dimensions of a bug barn, its volume will also double. Do you agree? Use one of the above bug barns to show your work.

No; Sample explanation: when I double the dimensions of the small bug barn, the volume is $10 \times 8 \times 8 = 640$ cubic inches. That is eight times the volume of the small bug barn, not two times.