

# GEOMETRY & MEASUREMENT

## ELEMENTARY FOLDER GAMES

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### Targets standards in these areas:

- Geometry
- Measurement & Data
- Mathematical Practices

For full description, see page 2.

### What's Included

- 10 activity folders
- 10 storage pouches with manipulatives
- 10 answer cards
- Flip-top storage box
- Reproducible assessment (on page 3 of this guide)
- Reproducible versions of game pieces (on pages 4–12 of this guide)

### Before You Begin

• To set up the folder games, place the game pieces and answer cards in their corresponding storage pouches. (The pieces are color-coded to match the pouches and folders.) Place pawns in the Ride the Mountain and Turn Up the Volume pouches, and place the protractor in the Juggling Contest pouch. You will also need to attach one spinner each to the Ride the Mountain and Turn Up the Volume folders. Simply snap the front and back of each spinner together through the hole in the folder. Slip the pouches inside their folders in the storage box, and your folder games are ready to use!

**Note:** For your convenience, reproducible versions of the game pieces are included on pages 4–12 of this guide. If any of the tokens for the Juggling Contest, Pop the Balloons, Treasure Map, or Bull's-Eye! folders are lost, you can photocopy the reproducible versions or use plastic chips instead.

## About the Folder Games

Ten easy-to-play folder games provide independent, hands-on practice with geometry and measurement. Each folder includes materials and simple, illustrated instructions for an engaging, focused activity—plus a bonus activity to reinforce the new concept. You can set the games in your math center and have students rotate through, or invite students to select games to play on their own at their desks. However you use them in your classroom, these folder games are a great way to boost students' math skills!

## Getting Started

Before students play the games on their own, be sure to model each one. Invite volunteers to help you. Select a folder and point out that the front of the folder shows the materials students need. Next, read the instructions together. Remind students to look at the illustrations to make sure they understand what to do. Have volunteers take turns playing the game and prompt them to check their work with the answer card.

## Assessment

- An assessment can be found on page 3 of this guide. The assessment can be used as a pre-assessment tool to identify which folders students should be able to work on independently. It can also be used to identify which skill sets students need to develop further before they play the games independently.
- As a post-assessment tool, the questions can be used to check student understanding and record student progress. Each question on the assessment corresponds to a skill covered in a specific folder.

## Folder Skills

Folder	Skill
Quiz Show	Terms & Concepts
Pool Party	Line Plots
Juggling Contest	Angles & Triangles
Ride the Mountain	Customary Conversions & Time
Pop the Balloons	Lines, Points & Rays
Buy That House	Perimeter & Area
Blast Off!	Classifying 2-D Shapes
Bull's-Eye!	Metric Conversions
Turn Up the Volume	Volume
Treasure Map	Solving for Unknown Measurements

**ELL**

- Review any unfamiliar vocabulary before students begin the game. Then have students create a flash card for each of the 10 topics covered in the set. Have them label each card with the name of the folder that covers that topic. On the cards, students can record information about the topics. For example, the Quiz Show folder covers geometry terms and concepts. Have students create a flash card for any concept that is unfamiliar. On one side, they can add the drawing and the definition from the folder. On the other side, they can write the term. Or select a problem from the game and write it on your board or chart paper. Walk students through the problem and have them record their work on a flash card. Students can keep their cards in an envelope or on a binder ring and use them for reference when playing the games.
- A protractor is included for the Juggling Contest folder. Make sure students know how to use a protractor.

**Reteach/Extra Support**

- Work with students in small groups or one-on-one. Read through the three-step illustrated instructions on a selected folder together. Then model the activity. Make sure students have a clear understanding of game play.
- Review geometry terms and definitions. Have students create flash cards for each term from the Quiz Show folder.
- Review the attributes found in shapes ranging from quadrilaterals to squares. Have students draw and label examples of each on index cards or in a math journal.
- Some folders have formulas and other information printed inside for students to reference as they play. Help students find this information, and explain how they can use it to solve problems.
- Have students play with a partner and take turns solving problems.

**Challenge**

- Have students complete the bonus activity on the front of each folder.
- Have students create and solve additional problems similar to the ones found in each folder.
- Have students time themselves each time they play the game. Have them graph or record the data to see if their time improves.

## Standards Correlation

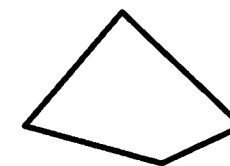
Folder(s)	Measurement & Data
Ride the Mountain; Bull's-Eye!	Knowing relative sizes of measurement units within one system of units; expressing measurements in a larger unit in terms of a smaller unit; recording <b>measurement equivalents</b> in a two-column table
Ride the Mountain; Treasure Map	Using the four operations to solve <b>word problems</b> involving distances, time intervals, liquid volumes, masses, and money
Buy That House; Treasure Map	Applying the <b>area and perimeter formulas</b> for rectangles in real-world and mathematical problems
Pool Party	Making a <b>line plot</b> to display a data set of measurements in fractions of a unit ( $1/2$ , $1/4$ , $1/8$ ); solving problems involving addition and subtraction of fractions by using information from line plots
Quiz Show; Juggling Contest	<b>Recognizing angles</b> as shapes formed where two rays share an endpoint
Juggling Contest	<b>Measuring angles</b> in whole-number degrees using a protractor; sketching angles of a specified measure
Juggling Contest	Solving problems to find <b>unknown angles</b> on a diagram in real-world and mathematical problems
Bull's-Eye!; Treasure Map	Converting among different-sized <b>standard measurement units</b> , and using these <b>conversions</b> in multi-step problems
Pool Party	Making a <b>line plot</b> to display a data set of measurements in fractions of a unit ( $1/2$ , $1/4$ , $1/8$ ); using operations on fractions to solve problems involving information presented in line plots
Turn Up the Volume; Treasure Map	Applying the <b>volume formulas</b> for right rectangular prisms with whole-number edge lengths
Folder(s)	Geometry
Quiz Show; Pop the Balloons	<b>Drawing points, lines, line segments, rays, angles, and perpendicular and parallel lines</b> ; identifying these in two-dimensional figures
Quiz Show; Juggling Contest	<b>Classifying</b> two-dimensional figures based on parallel or perpendicular lines, or specified angles; recognizing and identifying right triangles
Quiz Show	Recognizing and drawing a <b>line of symmetry</b> , and identifying line-symmetric figures
Blast Off!	Understanding that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category
Blast Off!	<b>Classifying</b> two-dimensional figures based on properties
Folder(s)	Mathematical Practice
Quiz Show; Pool Party; Juggling Contest; Ride the Mountain; Pop the Balloons; Buy That House; Blast Off!; Bull's-Eye; Turn Up the Volume; Treasure Map	Making sense of problems and persevering in solving them
Ride the Mountain; Buy That House; Bull's-Eye; Turn Up the Volume; Treasure Map	Modeling with mathematics
Juggling Contest	Using appropriate tools strategically
Pool Party; Juggling Contest; Ride the Mountain; Pop the Balloons; Buy That House; Bull's-Eye; Turn Up the Volume; Treasure Map	Attending to precision

Assessment Answers

- |                             |                          |
|-----------------------------|--------------------------|
| 1. C. quadrilateral         | 6. A. 300 feet           |
| 2. C. 6                     | 7. C. rectangle          |
| 3. C. obtuse                | 8. A. 2,000 mL           |
| 4. C. 48 inches             | 9. C. 64 cm <sup>3</sup> |
| 5. B. $\overrightarrow{AB}$ | 10. B. 7 in.             |

# GEOMETRY & MEASUREMENT

- 1** What is this shape?  
 A. trapezoid  
 B. parallelogram  
 C. quadrilateral



- 6** A billboard is 90 feet wide and 60 feet tall. What is its perimeter?  
 A. 300 feet  
 B. 240 feet  
 C. 150 feet

**2** **Height of Bean Sprouts**

How many bean sprouts are  $3/4$ " or taller?  
 A. 2 B. 4 C. 6

- 7** I have 4 right angles.  
 My opposite sides are parallel.  
 My opposite sides are congruent.  
 What shape am I?  
 A. triangle B. rhombus C. rectangle

- 3** A  $91^\circ$  angle is \_\_\_\_\_.  
 A. acute  
 B. right  
 C. obtuse

- 8** How many milliliters are in a 2-liter bottle of soda? (1,000 mL = 1 L)  
 A. 2,000 mL  
 B. 4,000 mL  
 C. 1,000 mL

- 4** How many inches long is a 4-foot snake?  
 A. 12 inches  
 B. 36 inches  
 C. 48 inches

**9**

What is the volume of the rectangular prism?  
 A. 14 cm<sup>3</sup> B. 32 cm<sup>3</sup> C. 64 cm<sup>3</sup>

- 5** How would you name a ray that starts at point A and goes through point B?  
 A.  $\overleftrightarrow{AB}$  B.  $\overrightarrow{AB}$  C.  $\overline{AB}$

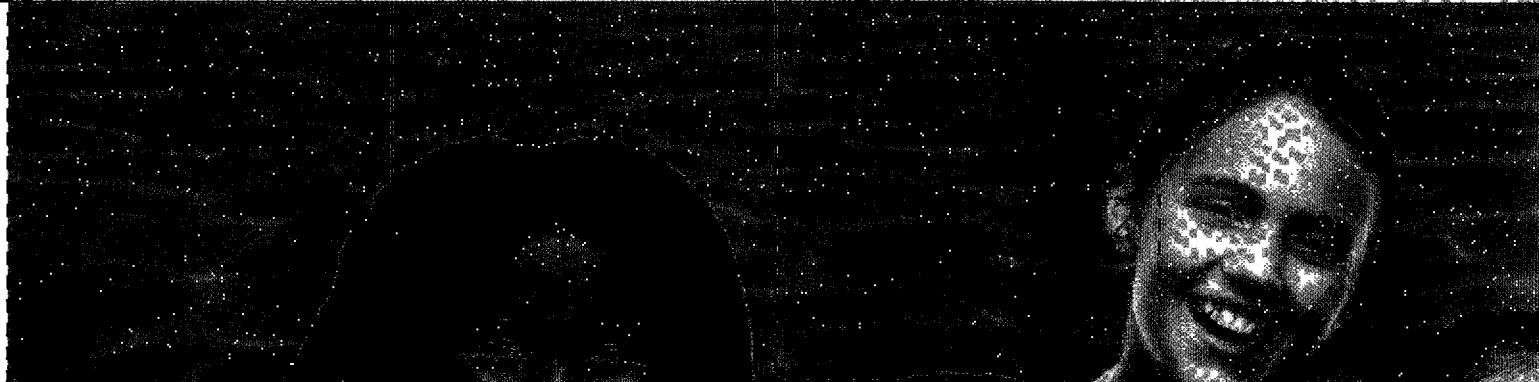
- 10** A square has an area of 49 in.<sup>2</sup> What is the length of each of its sides?  
 A. 6 in.  
 B. 7 in.  
 C. 8 in.

## FOLDER 1 - QUIZ SHOW

What is a trapezoid?	What is an equilateral triangle?	What is a shape with 3 lines of symmetry?	What are parallel lines?
What is a rhombus?	What is a quadrilateral?	What is a line of symmetry?	What is a ray?
What is an acute angle?	What is a parallelogram?	What is a scalene triangle?	What is a shape with 2 lines of symmetry?
What is a line segment?	What is a straight angle?	What is a right triangle?	What is an isosceles triangle?
What is an asymmetrical shape?	What are perpendicular lines?	What is an obtuse angle?	What is a right angle?

## FOLDER 2 - POOL PARTY


How many rocks weigh 1 pound?	How many students ran in all?	Did the majority of students run more than $\frac{5}{8}$ of a mile?	How many bugs were measured?
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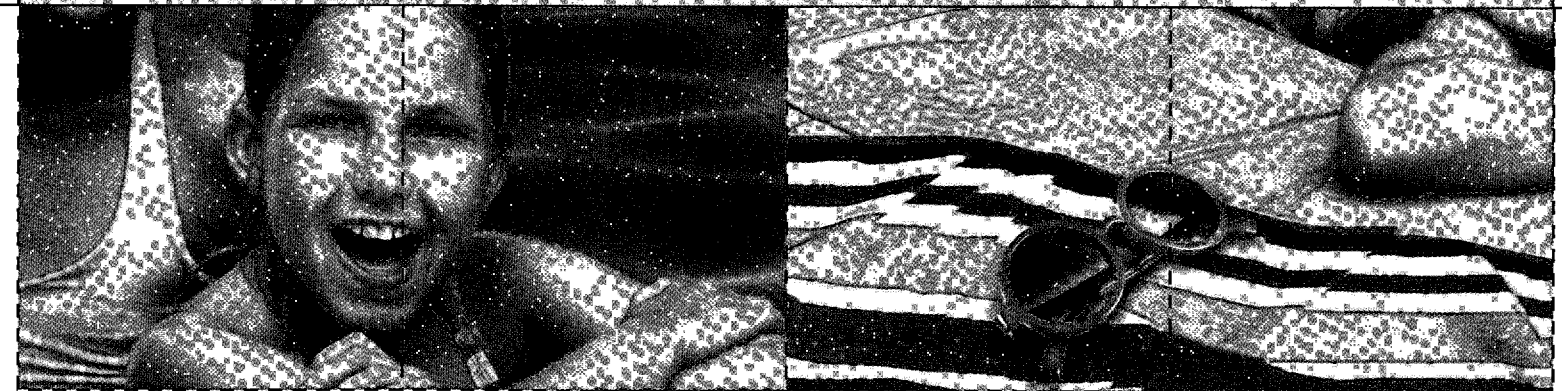
Note: Cut out on dashed lines; fold on solid lines.

## FOLDER 2 - POOL PARTY (CONTINUED)

What is the weight of all the rocks?	How many bugs are less than $\frac{3}{4}$ inch long?	How many rocks were weighed?	How many students ran 1 mile?
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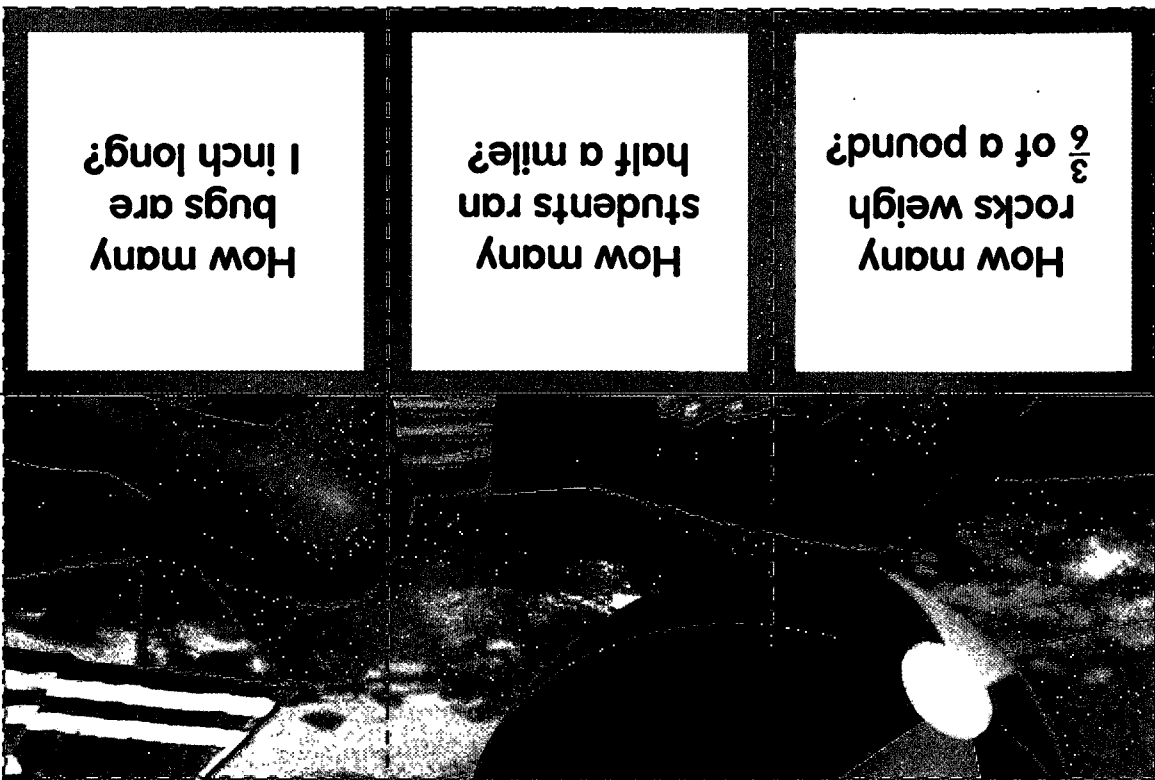


What is the combined distance of the students who ran $\frac{3}{8}$ of a mile?	If you lined up the bugs end to end, how long would the line be?	What's the difference in weight between the heaviest and lightest rocks?	What's the difference in length between the longest and shortest bugs?
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Note: Cut out on dashed lines; fold on solid lines.

## FOLDER 2 - POOL PARTY (CONTINUED)



How many  
bugs are  
1 inch long?

How many  
students ran  
half a mile?

How many  
rocks weigh  
 $\frac{2}{3}$  of a pound?

Note: Cut out on dashed lines; fold on solid lines.

## FOLDER 3 - JUGGLING CONTEST

<p>What kind of <b>triangle</b> has one <math>90^\circ</math> angle?</p> <p>1</p>	<p>What kind of <b>triangle</b> is this?</p> <p>2</p>	<p>What kind of <b>triangle</b> is this?</p> <p>3</p>
<p>I am <math>89^\circ</math>. What kind of <b>angle</b> am I?</p> <p>4</p>	<p>I am between <math>90^\circ</math> and <math>180^\circ</math>. What kind of <b>angle</b> am I?</p> <p>5</p>	<p>Find the measurement of this angle.</p> <p>6</p>
<p>Find the measurement of this angle.</p> <p>7</p>	<p>Find the measurement of this angle.</p> <p>8</p>	<p>Find the measurement of this angle.</p> <p>9</p>

## FOLDER 3 - JUGGLING CONTEST (CONTINUED)

<p>Find the measurement of this angle.</p> <p>10</p>	<p>Find the measurement of this angle.</p> <p>11</p>	<p>Find the measurement of this angle.</p> <p>12</p>
<p>Find the measurement of this angle.</p> <p>13</p>	<p>Find the measurement of this angle.</p> <p>14</p>	<p>Find the measurement of this angle.</p> <p>15</p>

Note: Color in yellow, blue, or green.

## FOLDER 5 - POP THE BALLOONS


Pink	Purple	Green
Which point does not lie on any line?	Find the right angle whose vertex is S.	Which line segment is a radius?
If $\angle NOM$ is $90^\circ$ , what is $\angle MOP$ ?	Find the acute angle whose vertex is Z.	Which line segment is a chord?
Which point lies on $\overline{NP}$ and $\overline{MQ}$ ?	Find an obtuse angle whose vertex is X.	Which 2 lines are perpendicular?
Which line segment is perpendicular to $\overline{MO}$ ?	Which <b>ray</b> intersects $\overline{WZ}$ ?	Find the ray.

Note: Color in tile borders as categorized.

## FOLDER 5 - POP THE BALLOONS (CONTINUED)

Pink	Purple	Green
Which line segment is parallel to $\overline{OR}$ ?	Which ray is parallel to $\overline{YZ}$ ?	Which 2 lines are parallel?

Note: Color in tile borders as categorized.



## FOLDER 6 - BUY THAT HOUSE
















**SOLD SOLD SOLD SOLD SOLD**

Dave wants to build a fence around his vegetable garden. He knows that one side of the garden is 30 feet long. If Dave's garden is the shape of a square, how long will the fence be? <b>1</b>	A triangular sail has a perimeter of 35 feet. The two longest sides are 15 feet and 13 feet. What is the length of the other side? <b>2</b>	Each side of a hexagonal hot tub is 6 feet. What is the hot tub's perimeter? <b>3</b>
A tennis court is 80 feet long and 30 feet wide. What is its perimeter? <b>4</b>	Lori has put 30 feet of wood trim along the ceiling of her bedroom. If the room is 15 feet long and 8 feet wide, how much more trim does Lori need? <b>5</b>	Jed wants to put baseboard around his room. Each wall is 10 feet wide. Jed doesn't need baseboard for the doorway, which is 3 feet wide. How much baseboard does he need? <b>6</b>
The perimeter of a square is 8 feet. The perimeter of a second square is also 8 feet. If the squares are side by side, what is the perimeter around both? <b>7</b>	Each side of a stop sign is half a foot long. What is the stop sign's perimeter? <b>8</b>	Muriel wants to paint one wall of her bedroom blue. The wall is 12 feet high and 10 feet wide. How many square feet must Muriel paint? <b>9</b>
















## FOLDER 6 - BUY THAT HOUSE (CONTINUED)

Adam's garage is 20 feet long. If the garage is 200 square feet, how wide is it? <b>10</b>	The perimeter of a square is 36 feet. What is its area? <b>11</b>	A movie screen is 70 feet long and 30 feet tall. What is its area? <b>12</b>
The surface area of a table is 15 square feet. If the table is 3 feet wide, how long is it? <b>13</b>	A classroom is 30 feet long and 20 feet wide. Only half of the classroom is carpeted. How much is not carpeted? <b>14</b>	A plank bridge is 25 feet long and 3 feet wide. What is its area? <b>15</b>

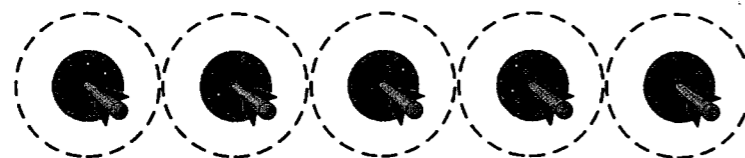
## FOLDER 7 - BLAST OFF

## FOLDER 7 - BLAST OFF (CONTINUED)

<b>Square</b>  Square	<b>Rhombus</b>  Square  Rhombus	<b>Rectangle</b>  Square  Rectangle
<b>BLAST OFF!</b>	<b>BLAST OFF!</b>	<b>BLAST OFF!</b>
<b>Parallelogram</b>  Square  Rectangle  Rhombus  Parallelogram	<b>Quadrilateral</b>  Square  Rectangle  Trapezoid  Rhombus  Quadrilateral  Parallelogram	
<b>BLAST OFF!</b>	<b>BLAST OFF!</b>	

## FOLDER 8 - BULL'S-EYE!



## FOLDER 8 - BULL'S-EYE! (CONTINUED)

Blue	Red	Purple
What metric unit do you use to measure volume? <b>1</b>	What metric unit do you use to measure distance? <b>2</b>	What fraction of a kilometer is 10 meters? <b>5</b>
How many kilometers is 6,000 meters? <b>3</b>	What fraction of a gram is 100 milligrams? <b>8</b>	The distance between two cities is 60,000 meters. What is the distance in kilometers? <b>6</b>
A centimeter is _____ times shorter than a meter. <b>4</b>	A kilogram is _____ times greater than a milligram. <b>9</b>	160 millimeters equals _____ centimeters. <b>7</b>
What fraction of a kilogram is 1 gram? <b>10</b>	You need 1 kilogram of sugar. You have only 885 grams. How much more sugar do you need? <b>12</b>	An adult might weigh _____. <b>11</b>
A big bottle of soda is about _____. <b>13</b>	A recipe calls for a liter of milk. You have only 750 milliliters of milk. How much more do you need? <b>14</b>	3 liters is _____ times greater than 3 milliliters. <b>15</b>

**Note:** Color in tile borders as categorized.

## FOLDER 10 - TREASURE MAP



A rectangular prism has a volume of $400 \text{ cm}^3$ . If the rectangular prism has a length of 5 cm and a width of 8 cm, what is its height? <b>volume = <math>l \times w \times h</math></b> <b>1</b>	It takes 2 hours and 45 minutes to travel from your house to the airport. If you need to arrive at the airport by 4:00 p.m., what time should you leave your house? <b>1 hour = 60 minutes</b> <b>2</b>	If a cube has a volume of $8 \text{ in.}^3$ , what is the length of each side? <b>volume = <math>l \times w \times h</math></b> <b>3</b>
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# FOLDER 10 - TREASURE MAP (CONTINUED)

The distance from Los Angeles to San Diego is 180,000 meters. If you've driven 100,000 meters, how many kilometers do you have left to go?

$$1 \text{ km} = 1,000 \text{ m}$$

4

A bedroom wall is 12 feet wide and 10 feet high. A window in the middle of the wall is 3 feet wide and 4 feet high. What is the area of only the wall?

$$\text{area} = l \times w$$

5

The width of a rectangle is 3 inches. If the rectangle's perimeter is 18 inches, what is its length?

$$\text{perimeter} = 2(l) + 2(w)$$

6

Daisy's garden is 12 feet long. If the area of her garden is 72 square feet, how wide is it?

$$\text{area} = l \times w$$

7

A bathtub is 5 feet long and 3 feet wide. If the tub can hold 30 cubic feet of water, how deep is it?

$$\text{volume} = l \times w \times h$$

8

A box is 2 feet long and 4 feet tall. If its volume is 32 cubic feet, how wide is the box?

$$\text{volume} = l \times w \times h$$

9

A rectangular swimming pool is 8 feet wide. Its perimeter is 116 feet. How long is the swimming pool?

$$\text{perimeter} = 2(l) + 2(w)$$

10

The flight from New York to Chicago is 1,145 kilometers. If you've flown 688 kilometers, how much farther do you have left to go?

11

A carpenter lines up 4 square tiles in a row. If the perimeter around all 4 tiles is 20 feet, what is the area of 1 tile?

$$\text{area} = l \times w$$

12

Dave built a rectangular pen for his puppies. If the area of the pen is 10 square meters and the length is 5 meters, what is the width?

$$\text{area} = l \times w$$

13

A baker starts with 900 grams of flour. After adding sugar and baking powder, the mixture weighs 1 kilogram. How many grams did the baker add?

$$1 \text{ kg} = 1,000 \text{ g}$$

14

A raw brisket is 2 kilograms. After Edith cooks it, the brisket is only 1.5 kilograms. How many grams were lost from cooking?

$$1 \text{ kg} = 1,000 \text{ g}$$

15