

## Measuring Length

Lengths are measured in customary units (inches, feet, yards) or metric units (centimeters, meters). Picking the right unit depends on the size of what you are measuring.

| Customary                   | Metric                     |
|-----------------------------|----------------------------|
| 1 foot = 12 inches          | 1 meter = 100 centimeters  |
| 1 yard = 3 feet = 36 inches | 1 kilometer = 1,000 meters |

### Key Concepts

- 1. Customary** units of length: inch, foot, yard, mile. **Metric** units: centimeter, meter, kilometer. The two systems are completely separate — don't mix them.
- 2. Conversions:** 12 in = 1 ft; 3 ft = 1 yd; 100 cm = 1 m. To go from a bigger unit to a smaller one, multiply. From smaller to bigger, divide.
- 3. Pick a unit that matches the size:** inches for short things (a pencil), feet for room-sized things, yards or meters for fields, miles or kilometers for trips.
- 4. To compare lengths in different units,** first convert both to the same unit.

### Worked Examples

① Convert 4 feet to inches.

 Going from a bigger unit (feet) to a smaller one (inches), so multiply. One foot has 12 inches, so four feet has  $4 \times 12 = 48$  inches.

 **Answer:** 48 inches

② Which unit is best to measure the length of a classroom: inches, feet, or yards?

 Inches are way too small (a typical classroom is hundreds of inches), and yards are reasonable but feet are most common in the U.S. for room-size measurements. *Feet* is the best fit.

 **Answer:** Feet

③ A ribbon is 2 meters long. How many centimeters is that?

 Going from meters (bigger) to centimeters (smaller), so multiply. 1 meter = 100 centimeters, so 2 meters =  $2 \times 100 = 200$  centimeters.

 **Answer:** 200 cm

### Practice Problems

Convert or choose the best unit.

- |                |       |                 |       |
|----------------|-------|-----------------|-------|
| 1. 3 ft = ? in | _____ | 4. 36 in = ? ft | _____ |
| 2. 2 yd = ? ft | _____ | 5. 9 ft = ? yd  | _____ |
| 3. 5 m = ? cm  | _____ | 6. 400 cm = ? m | _____ |

7. Best unit for a book: in, ft, yd? \_\_\_\_\_
8. Best unit for a football field? \_\_\_\_\_
9.  $6 \text{ ft} = ? \text{ in}$  \_\_\_\_\_
10.  $1 \text{ yd} = ? \text{ in}$  \_\_\_\_\_
11.  $7 \text{ m} = ? \text{ cm}$  \_\_\_\_\_
12.  $24 \text{ in} = ? \text{ ft}$  \_\_\_\_\_
- 

**Study Tips**

-  To convert a bigger unit into a smaller one, multiply. To go the other way, divide.
-  Memorize the three key conversions:  $12 \text{ in} = 1 \text{ ft}$ ,  $3 \text{ ft} = 1 \text{ yd}$ ,  $100 \text{ cm} = 1 \text{ m}$ . The rest of measurement gets easier.
-  Imagine the object before you pick a unit. Could you measure a pencil in yards? Sure, but the numbers would be tiny — inches are friendlier.

**Word Problems**

1. A table is 5 feet long. A shelf is 48 inches long. Which one is longer?

Answer: \_\_\_\_\_

2. Maria's ribbon is 3 meters long. She cuts off 150 centimeters. How many centimeters of ribbon are left?

Answer: \_\_\_\_\_

**Answer Key — with Friendly Explanations****Practice Problems**

1.  $3 \times 12 = 36$  inches.

 **Answer:** 36 *in*

2.  $2 \times 3 = 6$  feet.

 **Answer:** 6 *ft*

3.  $5 \times 100 = 500$  cm.

 **Answer:** 500 *cm*

4.  $36 \div 12 = 3$  feet.

 **Answer:** 3 *ft*

5.  $9 \div 3 = 3$  yards.

 **Answer:** 3 *yd*

6.  $400 \div 100 = 4$  meters.

 **Answer:** 4 *m*

7. A book is small — inches fit best.

 **Answer:** *Inches*

8. A football field is long — yards (or meters) fit best.

 **Answer:** *Yards*

9.  $6 \times 12 = 72$  inches.

 **Answer:** 72 *in*

10.  $1 \text{ yd} = 36 \text{ in}$  (since  $1 \times 3 \times 12 = 36$ ).

 **Answer:** 36 *in*

11.  $7 \times 100 = 700$  cm.

 **Answer:** 700 *cm*

12.  $24 \div 12 = 2$  feet.

 **Answer:** 2 *ft***Word Problems**

1.  $5 \text{ ft} = 60 \text{ in} > 48 \text{ in}$ .

 **Answer:** *Table is longer*

2.  $3 \text{ m} = 300 \text{ cm}$ ;  $300 - 150 = 150$ .

 **Answer:** 150 *cm left*

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