

Convert Customary Units of Length

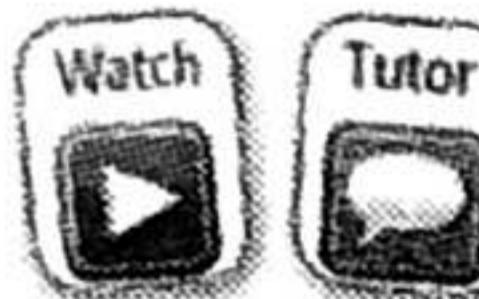
Lesson 2

ESSENTIAL QUESTION

How can I use measurement conversions to solve real-world problems?



Math in My World



Example 1

For many of the thrill rides at amusement parks, riders must be at least 48 inches tall. Cheng is 4 feet tall. Is he tall enough to ride a thrill ride at an amusement park?

Convert 4 feet to inches.

Since 1 foot = 12 inches, multiply 4 by 12.

$$\begin{array}{r} 1 \quad 2 \\ \times \quad 4 \\ \hline 4 \quad 8 \end{array}$$

So, 4 feet = 48 inches.

Is Cheng tall enough to ride the thrill rides? yes

Check Use division to check your answer. 48 $\div 4 = 12$



The units of length most often used in the United States are the inch, foot, yard, and mile. These units are part of the **customary system**.

Key Concept Customary Units of Length

- 1 foot (ft) = 12 inches (in.)
- 1 yard (yd) = 3 ft or 36 in.
- 1 mile (mi) = 5,280 ft or 1,760 yd

When you **convert** measurements, you change from one unit to another. To convert a larger unit to a smaller unit, multiply. To convert a smaller unit to a larger unit, divide.

Example 2



Convert 42 inches to feet.

Since you are changing a smaller unit to a larger unit, divide.

$$\begin{array}{r} & \boxed{3} & \boxed{\text{R}} & \boxed{6} \\ 12) & 4 & 2 \\ - & \boxed{3} & \boxed{6} \\ \hline & & 6 \end{array}$$

Interpret the remainder.

One Way Write the remainder in inches.

The remainder 6 means there are 6 inches left over.

42 inches = 3 feet 6 inches

Another Way Write the remainder as a fraction or decimal.

The fraction of a foot is $\frac{6}{12}$ or $\frac{1}{2}$.

42 inches = $3\frac{1}{2}$ feet

So, 42 inches is equal to 3 feet 6 inches, or $3\frac{1}{2}$ feet or 3.5 feet.

Guided Practice



1. Complete $60 \text{ in.} = \underline{\hspace{2cm}} \text{ ft}$

$$60 \div 12 = \underline{\hspace{2cm}}$$

So, 60 inches equals 5 feet.

2. Complete $16 \text{ yd} = \underline{\hspace{2cm}} \text{ ft}$

$$16 \times 3 = \underline{\hspace{2cm}}$$

So, 16 yards equals 48 feet.

Talk MATH

Explain how to convert units from feet to inches.



Name _____

Independent Practice

Complete.

3. $72 \text{ in.} = \underline{\quad 6 \quad} \text{ ft}$

4. $19 \text{ yd} = \underline{\quad 684 \quad} \text{ in.}$

5. $40 \text{ in.} = \underline{\quad 3\frac{1}{3} \quad} \text{ ft}$

6. $7,920 \text{ ft} = \underline{\quad 1\frac{1}{2} \text{ or } 1.5 \quad} \text{ mi}$

7. $6 \text{ yd} = \underline{\quad 216 \quad} \text{ in.}$

8. $26,400 \text{ ft} = \underline{\quad 5 \quad} \text{ mi}$

9. $9 \text{ ft} = \underline{\quad 108 \quad} \text{ in.}$

10. $22 \text{ ft} = \underline{\quad 7 \quad} \text{ yd } \underline{\quad 1 \quad} \text{ ft}$

11. $51 \text{ in.} = \underline{\quad 4 \quad} \text{ ft } \underline{\quad 3 \quad} \text{ in.}$

Compare. Use $<$, $>$, or $=$ to make a true statement.

12. $24 \text{ in. } \underline{<} 2 \text{ ft } 3 \text{ in.}$

13. $7 \text{ yd } \underline{>} 20 \text{ ft}$

14. $2 \text{ mi } \underline{>} 3,500 \text{ yd}$

15. $11\frac{1}{2} \text{ ft } \underline{<} 4 \text{ yd}$

16. $72 \text{ in. } \underline{=} 2 \text{ yd}$

17. $5.5 \text{ yd } \underline{>} 192 \text{ in.}$



Problem Solving

Mathematical

18. **PRACTICE** **Draw a Conclusion** Dana ran $\frac{1}{4}$ mile.

Trish ran 445 yards. Who ran the greater distance? Explain.

Trish; $\frac{1}{4}$ mi equals 440 yd and $445 > 440$.

19. Carlos is 63 inches tall. What is his height in feet?

$5\frac{1}{4}$ ft or 5.25 ft

What is his height in feet and inches?

5 ft 3 in.

20. The U.S.S. Harry Truman is an aircraft carrier that is 1,092 feet long. Find the length in yards.

364 yd

21. A bull had horns that measured 98 inches across.

What is this length in feet and inches?

8 ft 2 in.

What is this length in feet?

$8\frac{1}{6}$ ft

HOT Problems

Mathematical

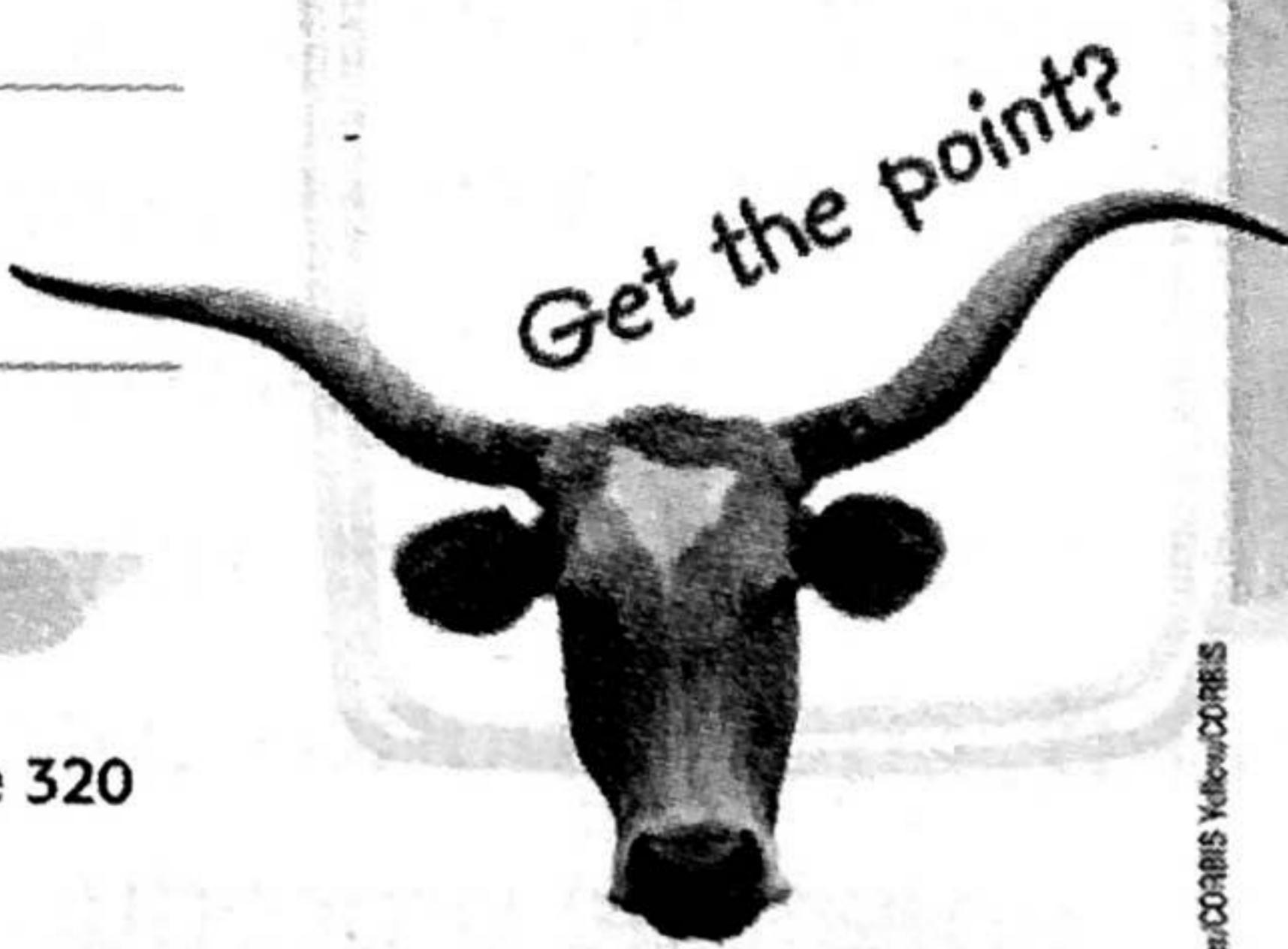
22. **PRACTICE** **Use Number Sense** There are 320 rods in a mile. Find the length of a rod in feet.

$16\frac{1}{2}$ ft or 16.5 ft

23. **Building on the Essential Question** Explain, using an example, why you need to multiply when converting from a larger unit to a smaller unit.

Sample answer: There are a greater number of inches in 3 feet

than there are feet in 3 feet.



MY Homework

Lesson 2**Convert
Customary Units
of Length**

Homework Helper

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The average height of a female giraffe is 15 feet.

What is the average height in yards?

Convert 15 feet to yards.

Since 3 feet = 1 yard, divide 15 by 3.

$$\begin{array}{r} 5 \\ 3 \overline{) 15} \\ - 15 \\ \hline 0 \end{array}$$

So, 15 feet = 5 yards.

The average height of the female giraffe is 5 yards.

Check Use multiplication to check your answer.

$$5 \times 3 = 15$$

Practice

Complete.

1. $5 \text{ mi} = \underline{8,800} \text{ yd}$

2. $7 \text{ yd} = \underline{252} \text{ in.}$

3. $150 \text{ in.} = \underline{\frac{4}{6}} \text{ yd}$

4. $110 \text{ in.} = \underline{9} \text{ ft } \underline{2} \text{ in.}$ 5. $8 \text{ yd} = \underline{288} \text{ in.}$ 6. $13,200 \text{ ft} = \underline{2.5} \text{ mi}$

Vocabulary Check



Fill in the correct circle that corresponds to the best answer.

7. Which of the following is not a common unit of measurement for the customary system?

- (A) feet (C) meter
(B) inches (D) miles

8. Which operation is necessary to convert a smaller unit to a larger unit?

- (F) addition (H) multiplication
(G) subtraction (I) division



Problem Solving

9. **PRACTICE** **Be Precise** Ty has two pieces of wood. Use $<$, $>$, or $=$ to compare the pieces of wood.

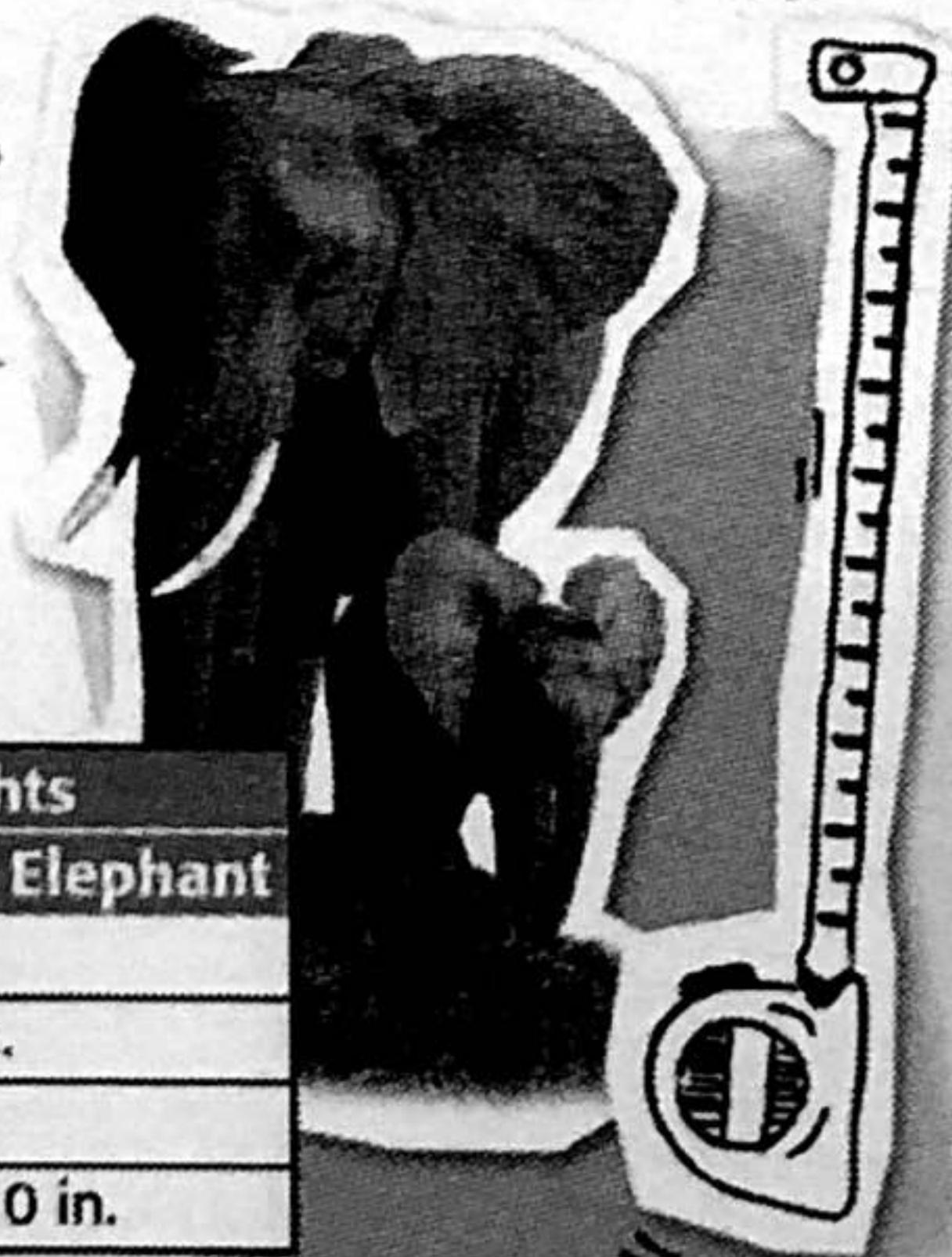
Sample answer: $1 \text{ yd } 9 \text{ in.} > 44 \text{ in.}$

Piece	Length
1	1 yd 9 in.
2	44 in.

10. Lily built an orange shelf and a brown shelf to hang in her room. The orange shelf is 5 feet 6 inches long. The brown shelf is twice as long. What is the length of the brown shelf?

11 feet

How tall am I?



Test Practice

11. The table shows the name of each volunteer and the height of the baby elephant each volunteer measured. Which volunteer measured the tallest elephant?

- (A) George (C) Mariah
(B) Kelsey (D) Bryan

Elephant Heights	
Volunteer	Height of Elephant
George	2 yd
Kelsey	68 in.
Mariah	5 ft
Bryan	5 ft 10 in.