



## UNIT 3 GOALS:

- Use multiplication as a comparison.
- Convert larger units of measurement to smaller units of measurement.

## VOCABULARY

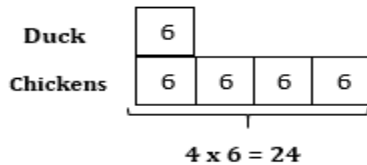
**Multiplicative comparison**- comparing two quantities by showing one is a specified number times larger or smaller than the other.

**Metric**- unit of measurement based on the base-ten number system.

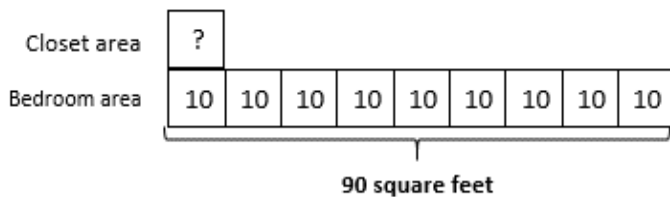
**Customary**- units of measurements used in the United States, e.g., gallons, inches, and miles.

### Multiplicative Comparison

Students should understand multiplication as a comparison. For example, there are 6 ducks. Soon, four times as many chickens came. How many chickens are there?



Jackson's rectangular bedroom has an area of 90 square feet. The area of his bedroom is 9 times that of his rectangular closet. If the closet is 2 feet wide, what is its length?



Since Jackson's bedroom has an area of 90 square feet and is 9 times that of his closet, students can draw a model to find the area of the closet. The area of the closet is 10 square feet.

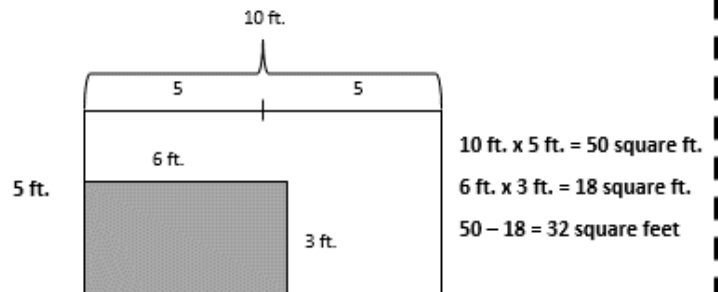
If the closet is 2 feet wide and its area is 10 square feet, we can use the area formula to find the length of the closet.

$$A = l \times w$$

$$10 \text{ square feet} = l \times 2 \text{ feet}$$

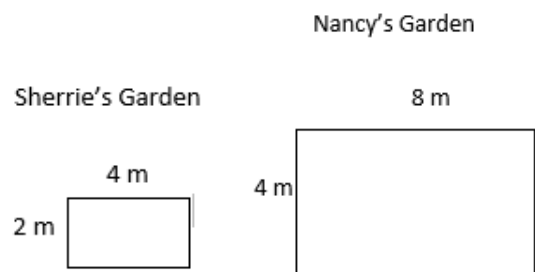
The length of Jackson's closet is 5 feet.

The width of David's rectangular tent is 5 feet. The length is twice the width. David's rectangular air mattress measures 3 feet by 6 feet. If David puts the air mattress in the tent. How many square feet of floor space will be available for the rest of his things?



There is 32 square feet of floor space left in the tent.

Sherrie's rectangular garden is 8 square meters. The longer side of the garden is 4 meters. Nancy's garden is twice as long and twice as wide as Sherrie's rectangular garden. Compare the perimeter and area of each garden. What do you notice?



	Area = (l x w)	Perimeter = 2 x (l + w)
Sherrie	8 square meters	12 m
Nancy	32 square meters	24 m

The area of Nancy's garden is four times the area of Sherrie's garden.

The perimeter of Nancy's garden is twice the perimeter of Sherrie's garden.

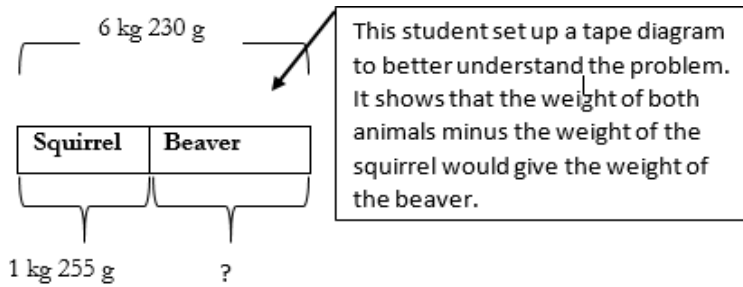
**Measurement Conversions:**

Listed below are measurements students will work with during this unit.

	Length	Weight	Liquid Volume
Metric Units of Measurement	<b>Millimeter (mm)</b> <b>Centimeter (cm):</b> 1 cm = 10 mm <b>Meter (m):</b> 1 m = 100 cm <b>Kilometer (km):</b> 1 km = 1000 m	<b>Grams (g)</b> <b>Kilogram (kg):</b> 1 kg = 1000 g	<b>Milliliter (ml)</b> <b>Liter (l):</b> 1 liter = 1000 ml
Customary Units of Measure	<b>Inch (in.)</b> <b>Foot (ft.):</b> 1 ft. = 12 in. <b>Yard (yd.)</b> 1 yd. = 3 ft./36 in <b>Mile (mi.):</b> 1 mi. = 5,280 ft.	<b>Ounces (oz.)</b> <b>Pounds (lb.):</b> 1 lb. = 16 oz. <b>Tons (T):</b> 1 t = 2000 lbs.	<b>Gallon (gal.):</b> 1 gal. = 4 quarts <b>Quart (qt.):</b> 1 qt. = 2 pints <b>Pints (pt.):</b> 1 pt. = 2 cups <b>Cup (c):</b> 1 c = 8 ounces <b>Ounces (oz.)</b>

Students use this knowledge of unit conversion to solve addition and subtraction problems involving mixed units.

Together, a squirrel and a beaver weigh 6 kg 230 g. If the squirrel weighs 1 kg 255 g, how much does the beaver weigh?



$$\begin{array}{r}
 6 \text{ kg } 230 \text{ g} \longrightarrow 6230 \text{ g} \\
 -1 \text{ kg } 255 \text{ g} \longrightarrow -1255 \text{ g}
 \end{array}$$

This student converted to like units, grams, before subtracting.

$$\begin{array}{r}
 5 \ 11 \ 12 \ 10 \\
 \cancel{6} \ \cancel{2} \ \cancel{3} \ \cancel{0} \\
 - \\
 1 \ 2 \ 5 \ 5 \\
 \hline
 4, \ 9 \ 7 \ 5 \ \text{g} = 4 \ \text{kg} \ 975 \ \text{g}
 \end{array}$$

After subtraction, the 4,000 g are converted to 4 kg.