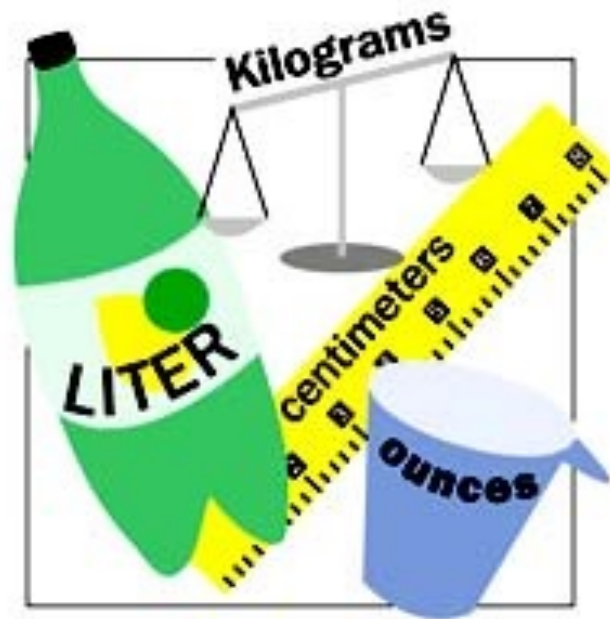


# International System of Measurement (SI)



# Why was the metric system invented?

- The metric system was invented because countries were using many different systems of measurement causing confusion and lack of consistency
- Other countries' companies are refusing to buy products from the U.S. if not labeled in metric units
- Almost all other countries are using the metric system

## Key Concept: Why do scientists use a standard measurement system?

- Scientists use SI to compare data and communicate with each other about their results
- Using SI measurement also allows experiments to be repeated and most importantly achieve a desired result

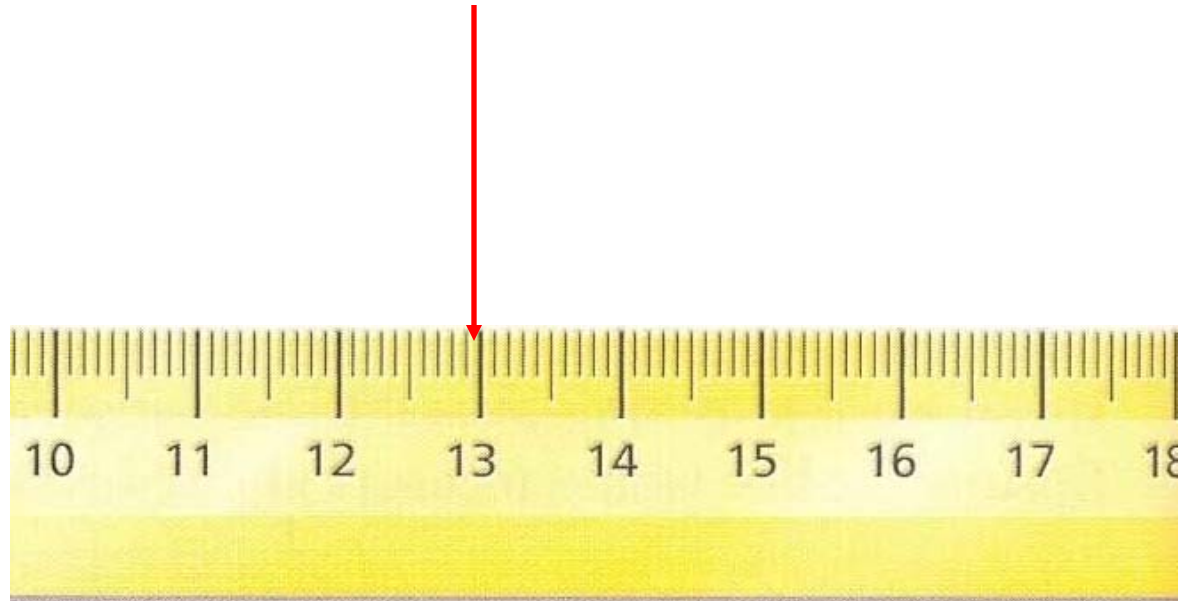
# The basic units in the SI system...

- length = meter
- mass = gram
- volume = liter



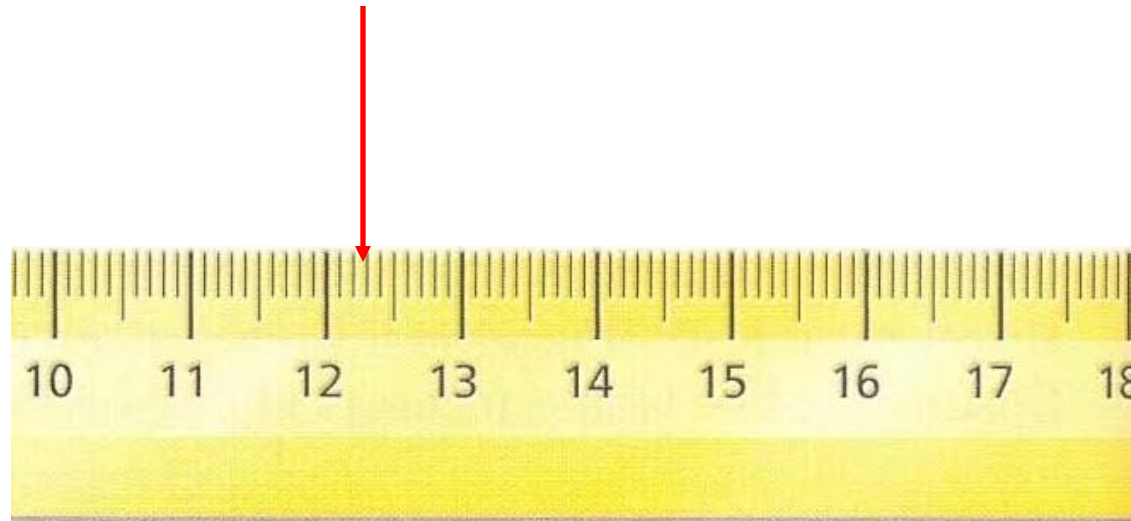
The longer lines on the metric ruler are called...

- centimeters



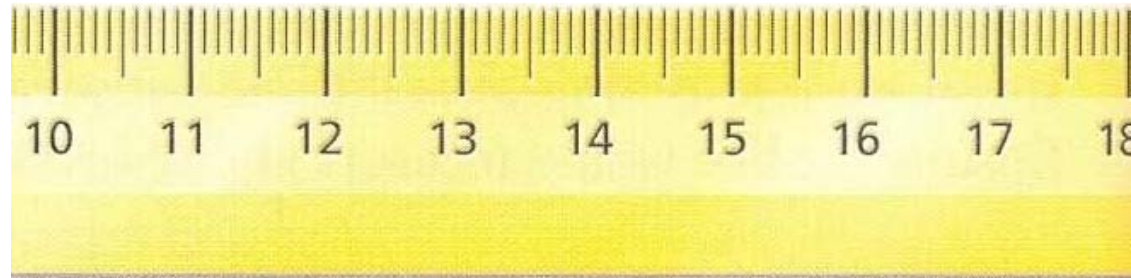
The shorter lines on the metric ruler are called...

- millimeters



One centimeter is divided into  
how many millimeters?

- 10 millimeters  
(mm)



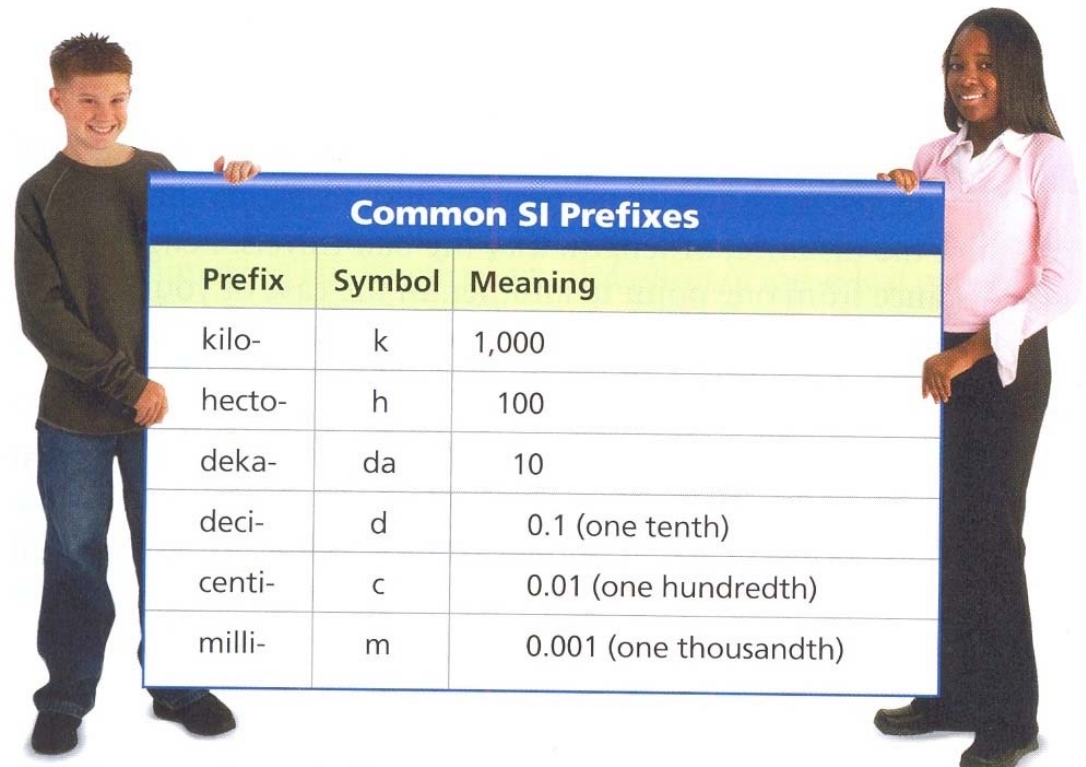
SI units are based on multiples of what number?

- SI units are based on multiples of 10
  - Add a zero
  - Subtract a zero



# Figure 1: **Calculating** - How much larger is a kilo- than a deka-?

- 100 times

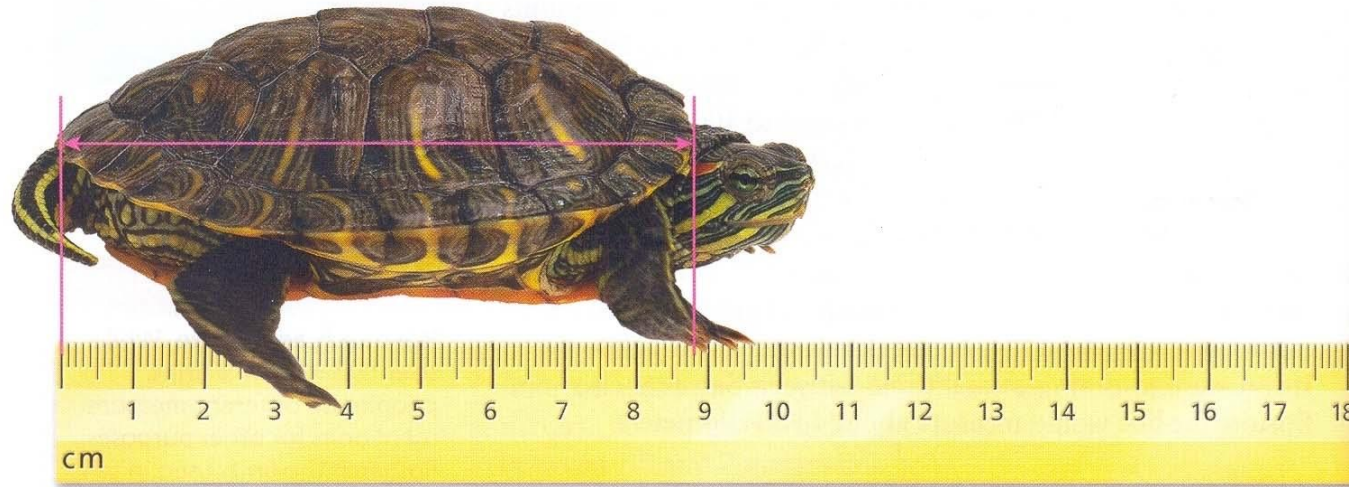


The image shows a young boy on the left and a young girl on the right, both smiling and holding a large blue table. The table is titled "Common SI Prefixes" and contains a table with three columns: Prefix, Symbol, and Meaning. The table lists six common SI prefixes: kilo-, hecto-, deka-, deci-, centi-, and milli-.

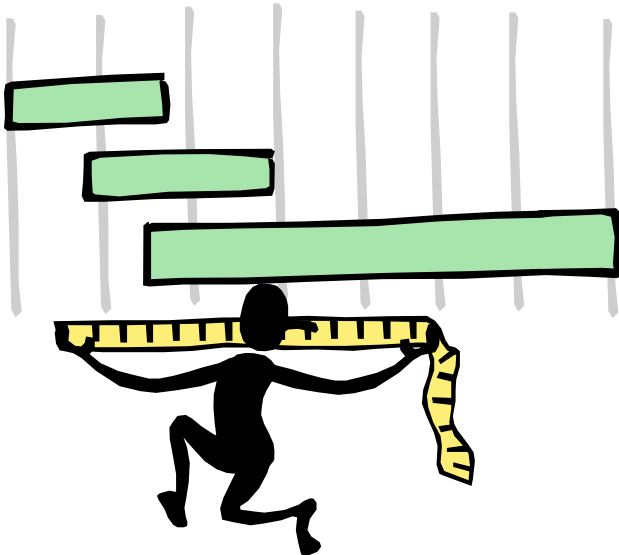
Common SI Prefixes		
Prefix	Symbol	Meaning
kilo-	k	1,000
hecto-	h	100
deka-	da	10
deci-	d	0.1 (one tenth)
centi-	c	0.01 (one hundredth)
milli-	m	0.001 (one thousandth)

Figure 2: **Calculating**: Measure the turtle in figure 2 from the rear of its shell to the tip of its nose. Record its length in both centimeters and millimeters.

- 10.5 cm
- 105 mm



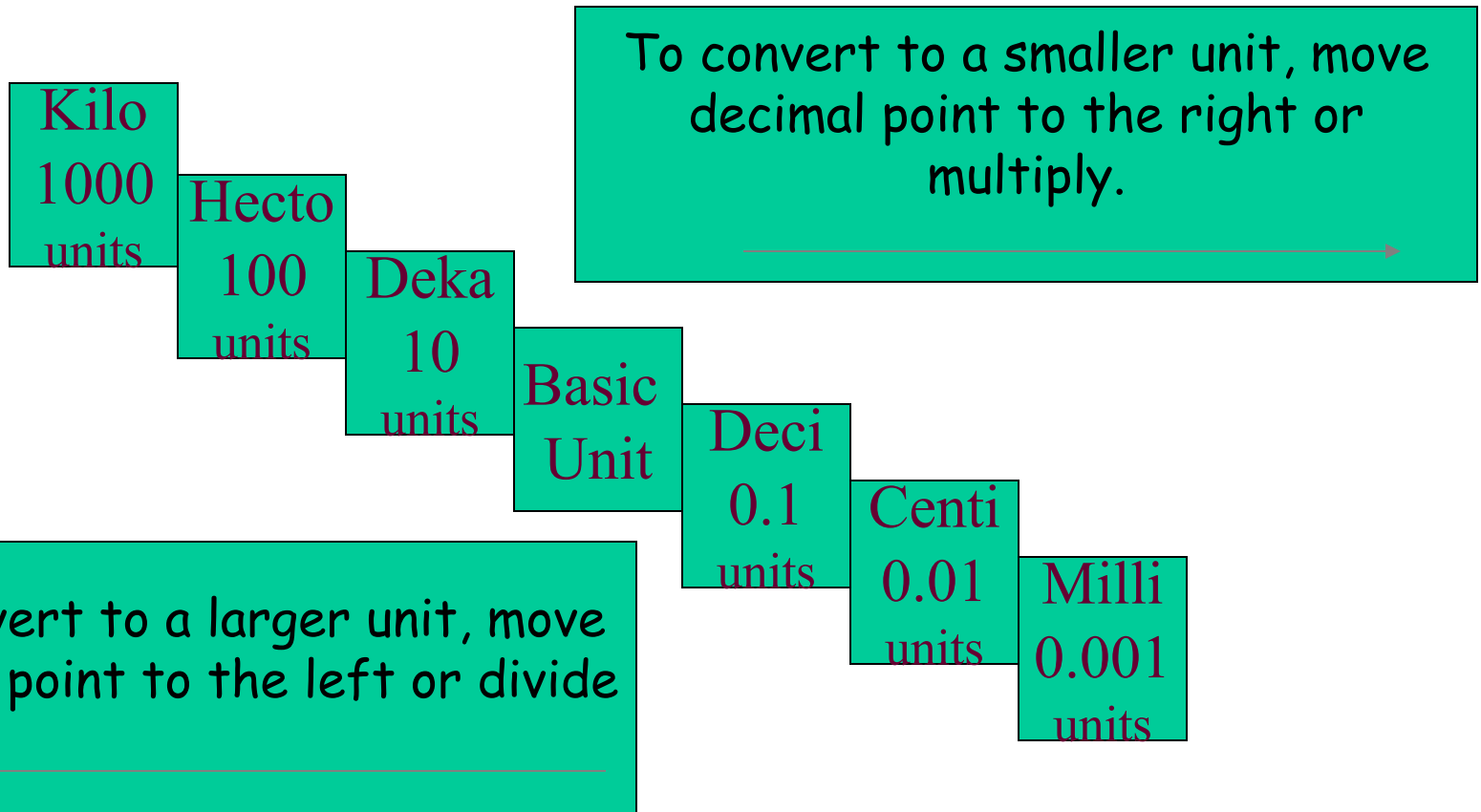
# Metric Mania



**Metric Conversions  
Ladder/Staircase  
Method**

# THE METRIC CONVERSION CHART (STAIRCASE METHOD)

King Henry Died by Drinking Chocolate Milk



# TRY THIS USING THE STAIRCASE METHOD

$$1000 \text{ mg} = \underline{\hspace{2cm}} \text{ g}$$

- Step 1: Determine if you are going to go up or down the ladder.
- Step 2: Determine how many steps there are from milligrams to grams.
- Step 3: Move the decimal point the amount of places that was determined in steps 1 & 2.

# TRY THIS USING THE STAIRCASE METHOD

$$1000 \text{ mg} = \underline{\quad 1 \quad} \text{ g}$$

Step 1: Determine if you are going to go up or down the ladder.

Step 2: Determine how many steps there are from milligrams to grams.

Step 3: Move the decimal point the amount of places that was determined in steps 1 & 2.

# TRY THIS USING THE STAIRCASE METHOD

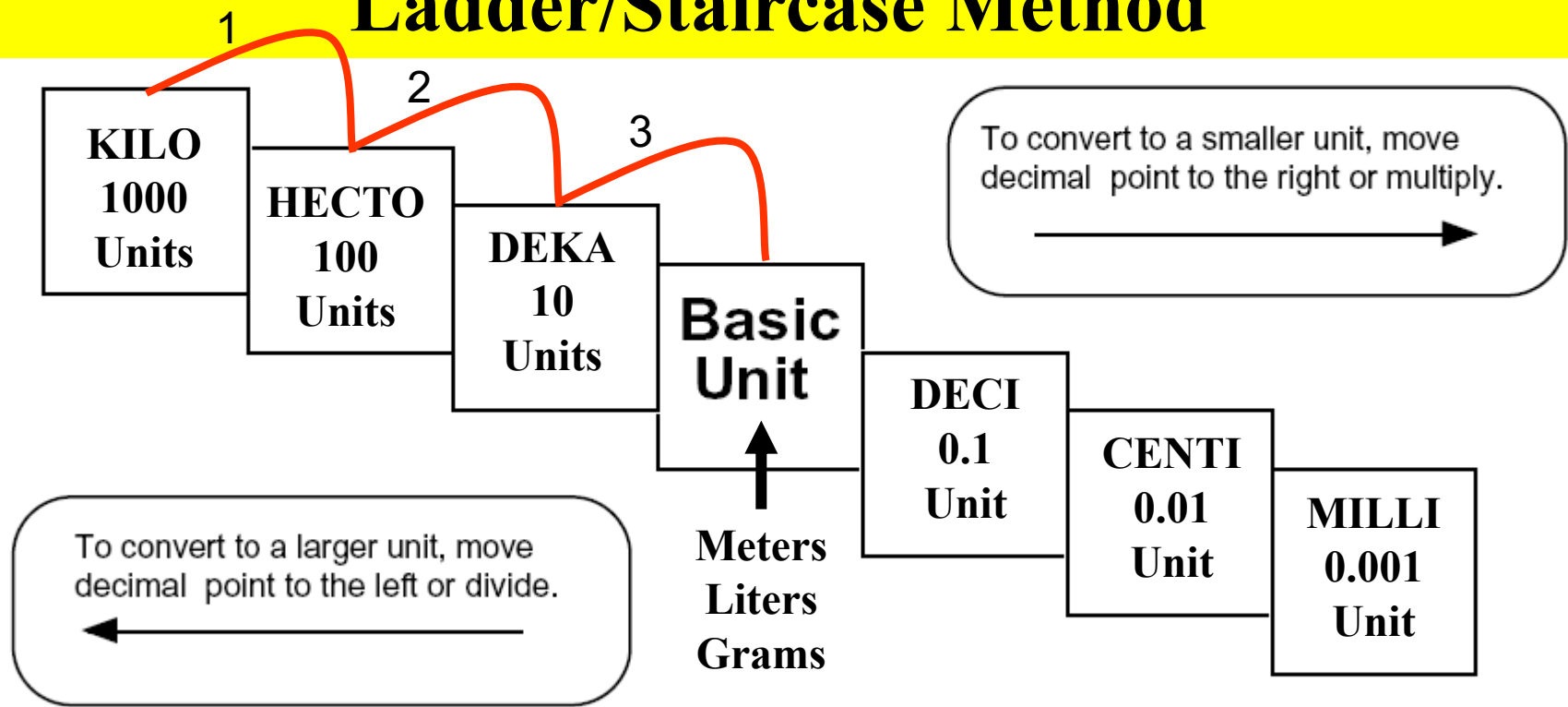
$$.15 \text{ L} = \underline{\hspace{2cm}} \text{ ml}$$

# TRY THIS USING THE STAIRCASE METHOD

$$.15 \text{ L} = \underline{150} \text{ ml}$$



# Ladder/Staircase Method



## How do you use the “ladder” method?

- 1<sup>st</sup> – Determine your starting point.
- 2<sup>nd</sup> – Count the “jumps” to your ending point.
- 3<sup>rd</sup> – Move the decimal the same number of jumps in the same direction.

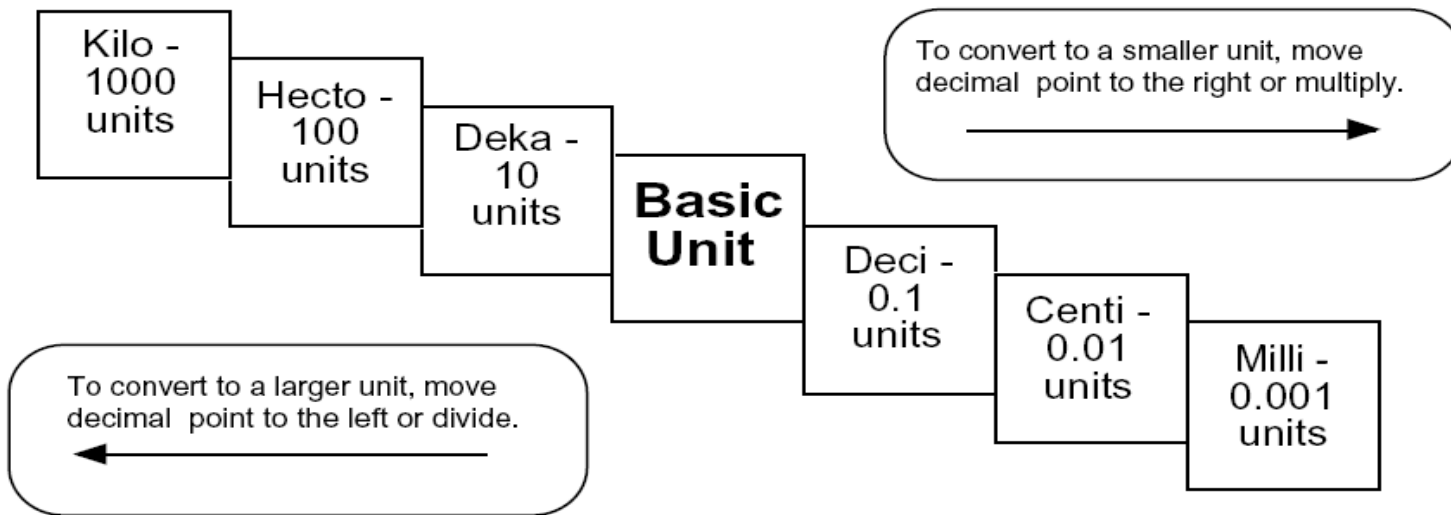
$$4 \text{ km} = \underline{\hspace{2cm}} \text{ m}$$

↑
↑  
 Starting Point      Ending Point

How many jumps does it take?

$$4.\overset{\cdot}{\underset{1}{\text{---}}}\overset{\cdot}{\underset{2}{\text{---}}}\overset{\cdot}{\underset{3}{\text{---}}}\overset{\cdot}{\text{---}} = 4000 \text{ m}$$

# Conversion Practice



Try these conversions using the ladder method.

$1000 \text{ mg} = \underline{\hspace{2cm}} \text{ g}$

$1 \text{ L} = \underline{\hspace{2cm}} \text{ mL}$

$160 \text{ cm} = \underline{\hspace{2cm}} \text{ mm}$

$14 \text{ km} = \underline{\hspace{2cm}} \text{ m}$

$109 \text{ g} = \underline{\hspace{2cm}} \text{ kg}$

$250 \text{ m} = \underline{\hspace{2cm}} \text{ km}$

Compare using  $<$ ,  $>$ , or  $=$ .

$56 \text{ cm} \bigcirc 6 \text{ m}$

$7 \text{ g} \bigcirc 698 \text{ mg}$

# Metric Conversion Challenge

**Write the correct abbreviation for each metric unit.**

1) Kilogram \_\_\_\_\_

4) Milliliter \_\_\_\_\_

7) Kilometer \_\_\_\_\_

2) Meter \_\_\_\_\_

5) Millimeter \_\_\_\_\_

8) Centimeter \_\_\_\_\_

3) Gram \_\_\_\_\_

6) Liter \_\_\_\_\_

9) Milligram \_\_\_\_\_

**Try these conversions, using the ladder method.**

10) 2000 mg = \_\_\_\_\_ g

15) 5 L = \_\_\_\_\_ mL

20) 16 cm = \_\_\_\_\_ mm

11) 104 km = \_\_\_\_\_ m

16) 198 g = \_\_\_\_\_ kg

21) 2500 m = \_\_\_\_\_ km

12) 480 cm = \_\_\_\_\_ m

17) 75 mL = \_\_\_\_\_ L

22) 65 g = \_\_\_\_\_ mg

13) 5.6 kg = \_\_\_\_\_ g

18) 50 cm = \_\_\_\_\_ m

23) 6.3 cm = \_\_\_\_\_ mm

14) 8 mm = \_\_\_\_\_ cm

19) 5.6 m = \_\_\_\_\_ cm

24) 120 mg = \_\_\_\_\_ g

**Compare using <, >, or =.**

25) 63 cm ○ 6 m

27) 5 g ○ 508 mg

29) 1,500 mL ○ 1.5 L

26) 536 cm ○ 53.6 dm

28) 43 mg ○ 5 g

30) 3.6 m ○ 36 cm