Metric System ... Updated – SI –
(*Systeme Internationale d' Unites*)

- The metric system is based on a <u>base unit</u> that corresponds to a certain kind of measurement

    - Length =

    - Volume =

    - Mass =

    - Time =

- Prefixes plus base units make up the metric system
  - Example:

    - Centi + meter =

    - Kilo + liter =

Derived Units

- Combination of base units
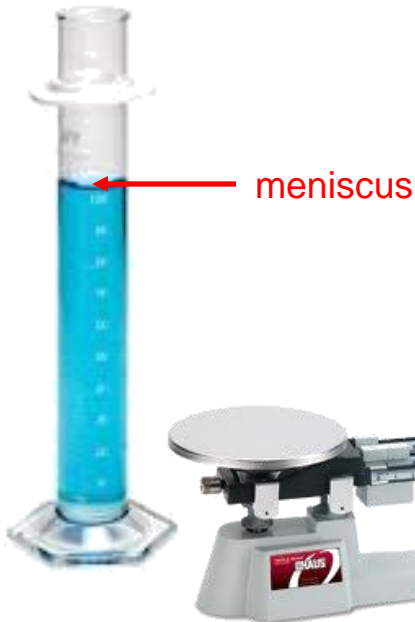
- Examples

  density =

  speed =

density

meniscus

1. Use a graduated cylinder to measure the _____ to nearest tenth mL.

2. (_____method)

1. Use a triple beam balance to measure the _____ to nearest tenth gram.

2. Use the data to calculate density. Label _____.

Metric System

- The three prefixes that we will use the most are:
  - kilo
  - centi
  - milli

kilo	hecto	deca	Base Units meter gram liter	deci	centi	milli
k	h	da	Base unit	d	c	m

Metric System

- These prefixes are based on powers of _____.
  What does this mean?
  - From each prefix every "step" is either:
    - _____larger

      or

    - _____smaller
  - For example
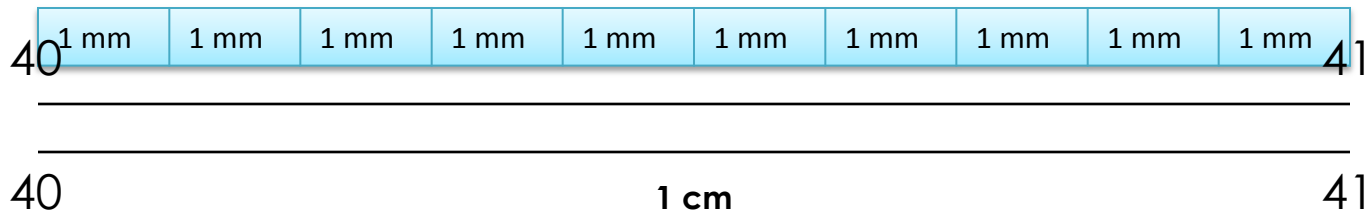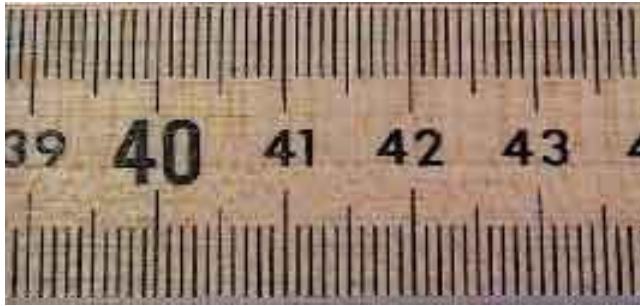   - Centimeters are 10 times larger than millimeters
    - 1 centimeter = _____

kilo	hecto	deca	Base Units meter gram liter	deci	centi	milli

Metric System

– Centimeters are 10 times larger than millimeters so it takes more millimeters for the same length

1 centimeter = _____ millimeters

Example not to scale

| 40 | 1 mm | 1 mm | 1 mm | 1 mm | 1 mm | 1 mm | 1 mm | 1 mm | 1 mm | 1 mm | 41 |

40   **1 cm**   41

Metric System

- For each "step" to right,
  you are _____

- For example, let's go from a base unit to centi

1 liter = _____deciliters = _____ centiliters

(1 x 10 = 10)   =   (10 x 10 = 100)

2 grams = _____decigrams = _____ centigrams

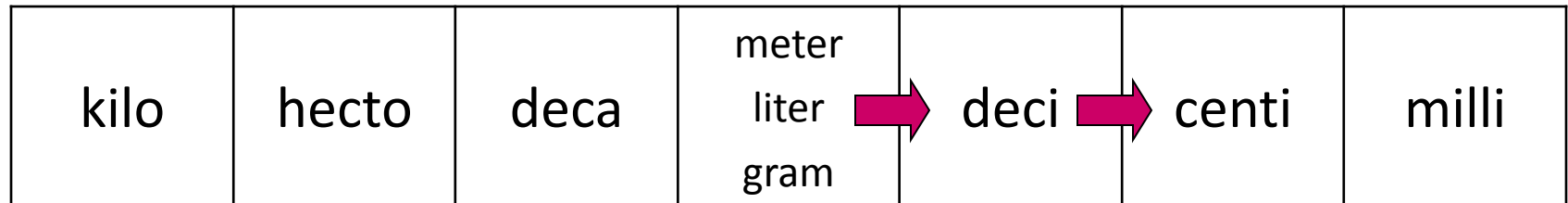(2 x 10 = 20)   =   (20 x 10 = 200)

kilo	hecto	deca	meter liter gram	deci	centi	milli

Metric System

- An easy way to move within the metric system is by moving the decimal point one place for each "step" desired

    Example: change meters to centimeters

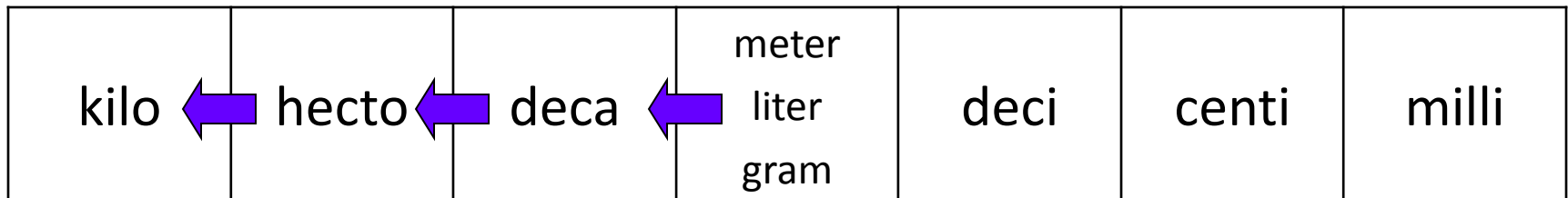   1 meter = _____decimeters = _____centimeters

kilo	hecto	deca	meter liter gram	deci	centi	milli

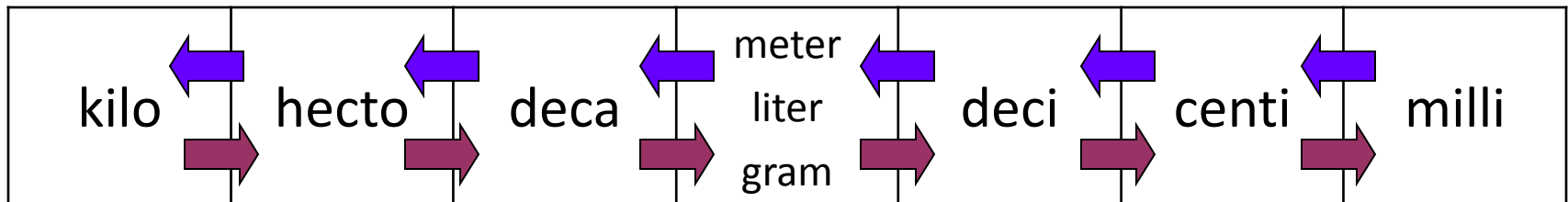# Metric System

- Example from meters to kilometers:

  16093 meters = _____decameters =

  _____ hectometers = _____ kilometers

- So for every "step" from the base unit to kilo, we moved the decimal ____ place to the _____ (the same direction as in the diagram below)

kilo	hecto	deca	meter liter gram	deci	centi	milli

Metric System

- If you move to the left in the diagram, move the decimal to the _____

- If you move to the right in the diagram, move the decimal to the _____

kilo	hecto	deca	meter liter gram	deci	centi	milli

Metric System

- Now let's start from centimeters and convert to kilometers

  400000 centimeters =

- Now let's start from kilograms and convert to milligrams

  0.4 kilograms =

kilo	hecto	deca	meter liter gram	deci	centi	milli

Metric System

- Summary
  - Base units in the metric system are meter, liter, gram

  - Metric system is based on powers of 10

  - For conversions within the metric system, each "step" is 1 decimal place to the right or left

  - Using the diagram below, converting to the right, moves the decimal to the right and vice versa

- Practice

18 m = _____ cm   167 mm = _____meters

1589 L = _____ mL   0.5 L = _____ kL

Which mass is greater? 600 grams or 4.9 kg

Which volume is greater? 0.26 dL or 30 mL

Which length is greater? 4000 cm or 12 meters

kilo	hecto	deca	meter liter gram	deci	centi	milli