

Name: _____ Date: 1-22-20 Period: _____

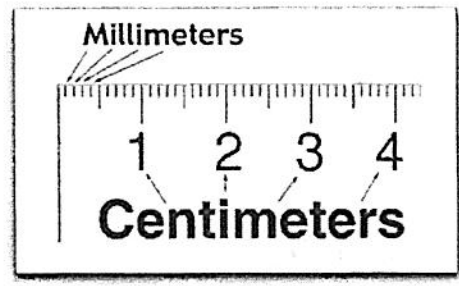
(NOTES)

The Metric System:

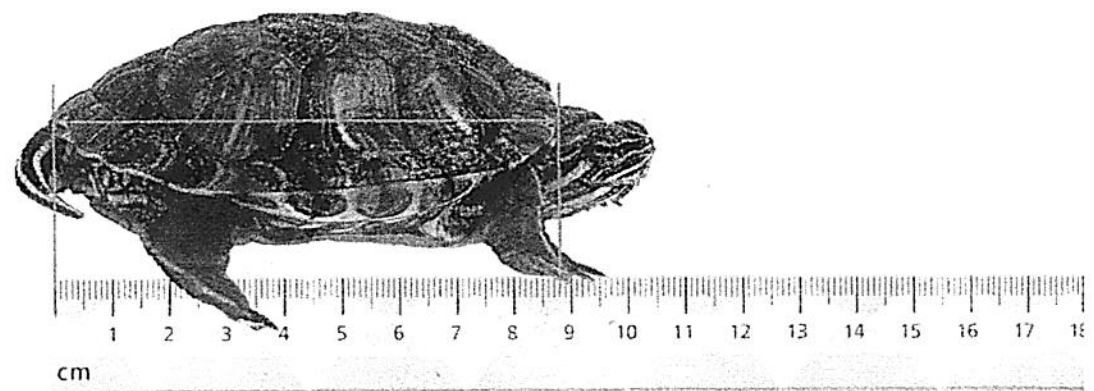
- Invented by a French scientist in 1790
- Called International System of Units (SI)
- Developed to standardize measurements
- Used by most countries except U.S.
- Based on multiples of 10

Length:

- The distance between two points.
- Meter is the basic SI unit for length
- Measured with a meter stick or metric ruler.
- Divisions on a metric ruler:
 - Big lines are centimeters (cm)
 - Small lines are millimeter (mm)



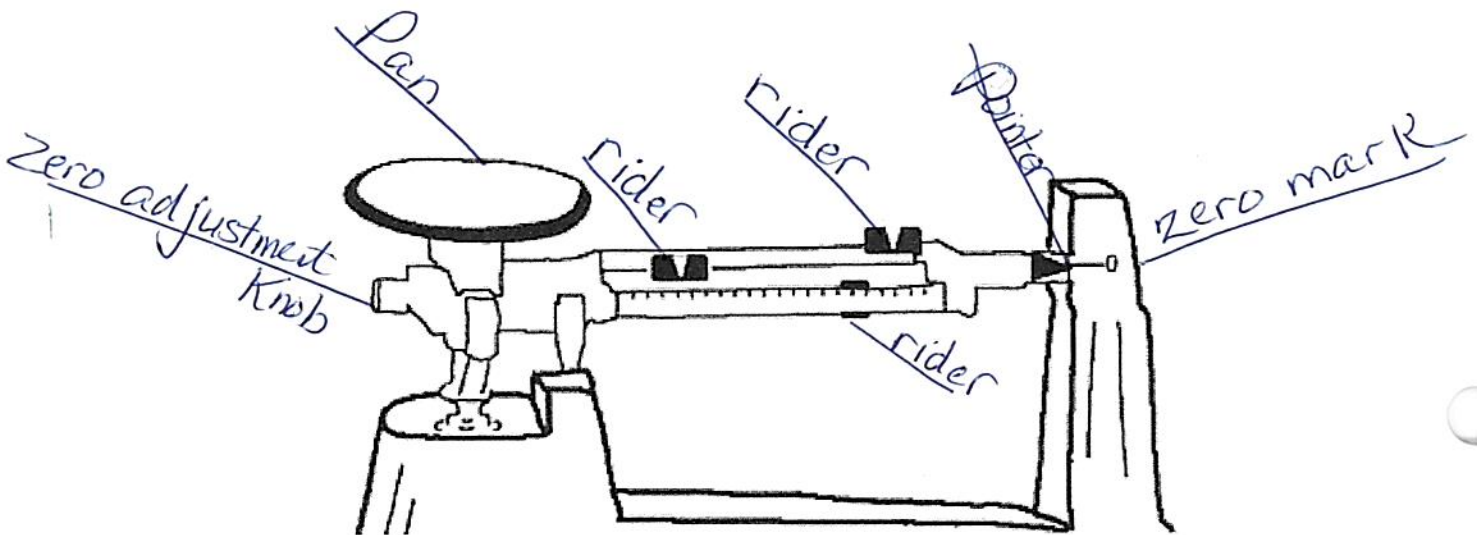
- Common units used for length of smaller objects:
 - Centimeter is 1/100 of a meter
 - 100 cm = 1 meter
 - Millimeter is 1/1000 of a meter
 - 1000 mm = 1 meter
 - 10 mm = 1 cm
- How long is the turtle's shell? 8.8 cm 88 mm



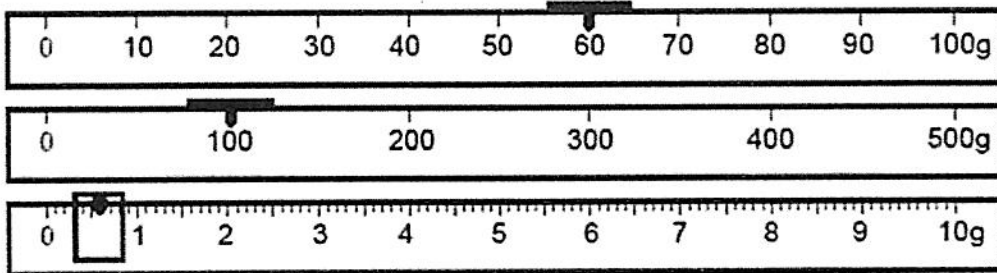
Mass:

- Amount of matter something is made of
 - **Matter:** Anything that has mass and takes up space is matter
- Gram is the basic SI unit for mass
 - 1 Kilogram = 1000 grams
- Measured with a triple beam balance

- Label the different parts of the triple-beam balance.



- To determine the mass, add all 3 values together



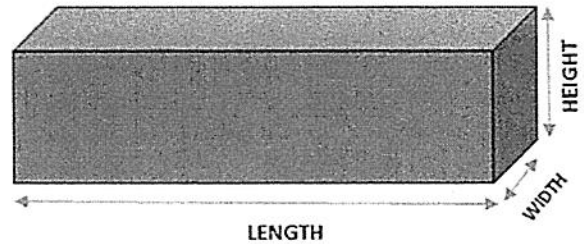
mass = 160.6 g

Jan 28, 2020
(notes)

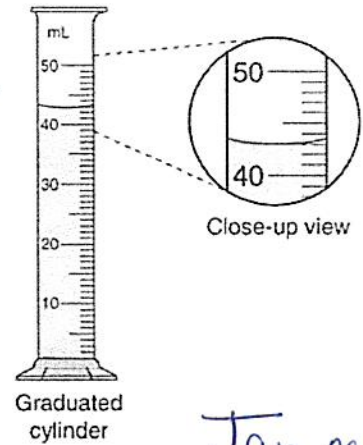
Volume:

- Amount of Space something takes up or contains
- Liter is basic SI unit for liquid volume
- Measurement:
 - Depends on the material:

- regular shape -
 $L \times W \times H$
(measured with metric ruler
in cm^3)



- liquid - (measured with graduated cylinder
in mL)



- irregular shape - determined by water displacement method
(measured with graduated cylinder in mL)
- Note: 1 mL = $1cm^3$

Jan 29, 2020
(notes)

Final volume - initial volume

$$\begin{array}{r} 15.0 \text{ mL} \\ - 10.0 \text{ mL} \\ \hline 5.0 \text{ mL} \end{array}$$

Volume of object
5.0 mL

10.0 mL 15.0 mL

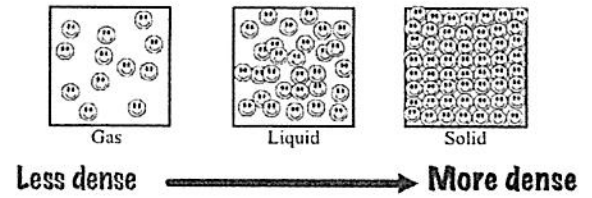
80.0 mL 100.0 mL

Volume of object
20.0 mL

$$\begin{array}{r} 100.0 \\ - 80.0 \\ \hline 20.0 \text{ mL} \end{array}$$

Density:

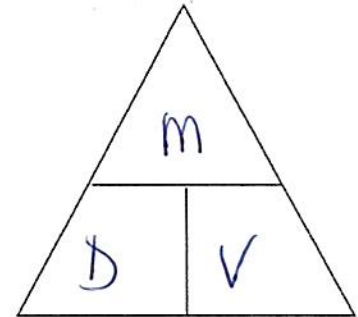
- Amount of mass in a specific amount of Volume
- How tightly packed the particles of an object are



- Calculated using the following formula:

Density = $\frac{\text{mass}}{\text{Volume}}$

D = m = grams v = cm^3 or mL



- Mass is measured in g
- Volume is measured in mL or cm^3

Why do some things float and others sink?

- Density of water = 1.0 g/cm^3 or 1.0 g/mL or 1.0 Kg/mL
- Object with density $> 1 \text{ g/cm}^3$ will sink in water
- Object with density $< 1.0 \text{ g/cm}^3$ will float in water
- Changing an objects size WILL NOT change its density!!!

Cubes in Water:

- A. 100 % under & on bottom ... $> 1 \text{ g/cm}^3$
- B. 90 % under ... 0.9 g/cm^3
- C. 40 % under ... 0.4 g/cm^3
- D. 50 % under... 0.5 g/cm^3
- E. 30 % under... 0.3 g/cm^3
- F. Suspended ... 1.0 g/cm^3

