Safety
&
Measurement

Safety in the Science Classroom

Top 10

1. No eating or drinking
2. No playing around in the room
3. Follow all written & verbal directions
4. Do not touch anything until told
5. Wear safety goggles/gloves as needed
6. Report any accident immediately
7. Don’t not touch or smell anything unless told
8. Do not remove anything from the classroom
9. Do not enter storage areas or open cabinets
10. Wash hands before leaving the science room

Thinking Like a Scientist

- Observe
- Question
- Hypothesize
- Record, Organize & Analyze Data
- Draw Conclusions
- Measure

- Infer
- Compare & Contrast
- Explain
- Model
- Communicate
- Practice Safety

Measurement

- BrainPOP!
  - Measuring Matter
  - Metrics

Measurement

Practicing *careful* measurement is an important part of science.

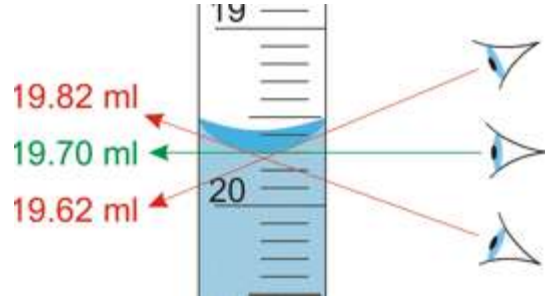
How do we measure?

What units are used?

Term →	Volume	Mass	Density	Distance/Length
Definition	Amount of space an object takes up	Amount of matter in an object	A ratio that compares the mass of an object to its volume OR how tightly packed the matter is within an object.	How far apart objects are or the physical length of an object
How can we find it?	L x W x H OR displacement in water: Measure the water in a graduated cylinder then drop in the object & measure again. Subtract the two amounts & you have the volume of the object.	Use a scale / balance (*Don't confuse mass with weight…that is affected by the gravitational pull on an object)	Calculate Density: D= M / V Density = Mass ÷ Volume	Car odometers Meter sticks Rulers Measuring tapes

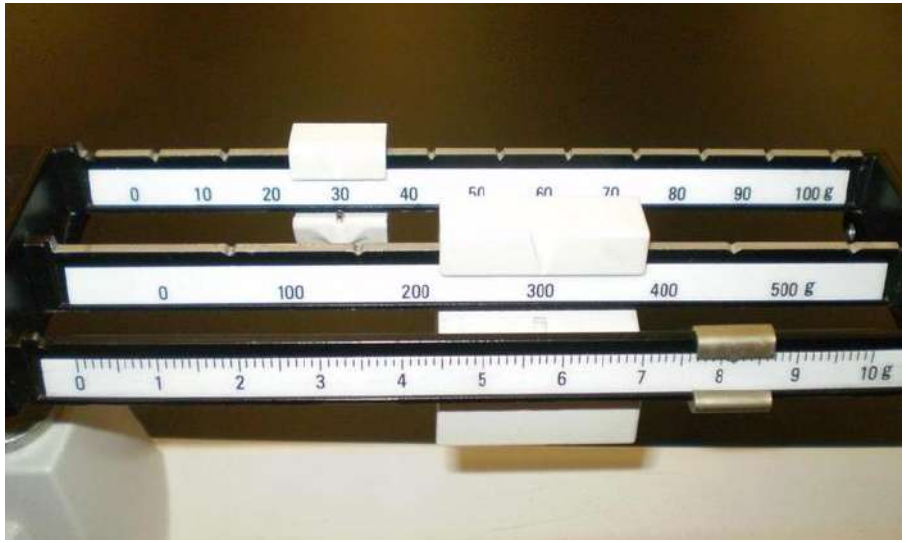
Metric Units (commonly)	**Liter** (ml OR kl)	**Grams** (kg OR mg)	**Cubic centimeter** cm^3	**Meter** (km OR cm OR mm)
Measured by	Graduated Cylinder or Beaker	Balance	Calculation	See above
Practice Measuring (Always include units!)	Reading a graduated cylinder: _____ _____ _____ Reading a beaker: _____ _____ _____ Volume using Displacement: Rock: _____	Using an electronic balance: Rock: _____ Paper clip: _____ Legos: _____	Using graduated cylinder & balance (follow displacement directions under volume & formula under density): Vol: _____ Mass: _____ Mineral Density: _____	Paper Clip: ____ Pen: ____ Table height: ____ Your shoe: ____ Door handle to floor:____

Tools of Measurement



Graduated Cylinder

Beaker

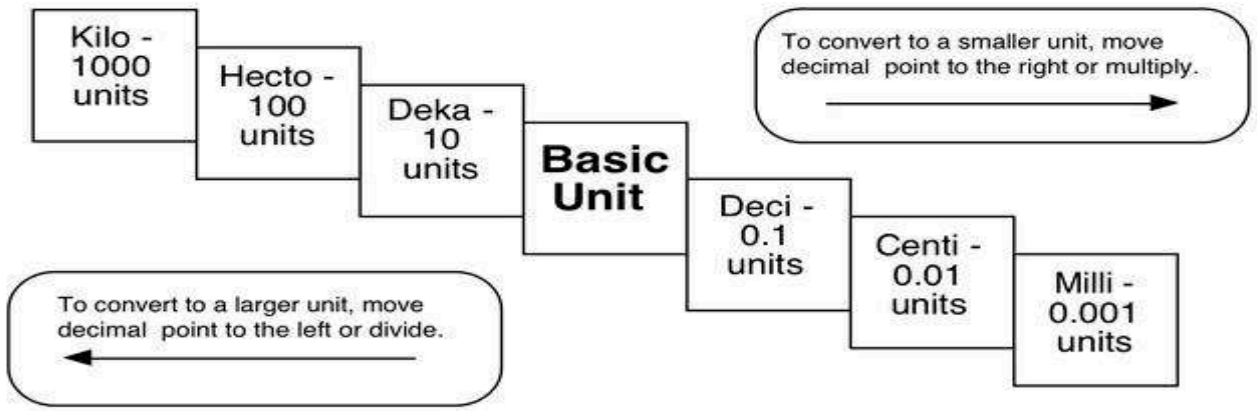


Triple Beam Balance

Electronic Balance

Metric Conversions

(King Henry Doesn't Usually Drink Chocolate Milk)



Practicing Measurement

- We will do Displacement & Density together

- Group Rules:
  - “Little Voices”
  - Follow safety rules
  - Respect each other
  - Take turns
  - Work together to accomplish your tasks
  - Check your work – especially the units you used!
  - Clean up / straighten up materials

Temperature

Read the passage, ‘Measuring Temperature’

- Use the passage to help fill in the temps for the Measuring Temperature table
- Use the passage to answer the 3 questions
- Watch BrainPop: Temperature

Measuring Temperature	Celsius	Fahrenheit
Freezing Point	0° C	32° F
Boiling Point	100° C	212° F

Which one is used mostly in science? CELSIUS

Which tool is used to measure temp? THERMOMETER

Why does the tool work?

Thermometers work to determine temperature because liquid changes volume (the amount of space it takes up) based on the temperature. When a liquid is cold it takes up less space than it does when it is warmer.
Thermometers use a large bulb filled with liquid & a small tube to show the changes because the changes are very small.

Customary vs. Metric Measurement

- Watch BrainPop: Customary Units
- Talk about converting from one to the other

Review for the Quiz: Safety & Measurement

- **<u>Matching</u>**:

A. Mass
B. Volume
C. Density
D. Weight

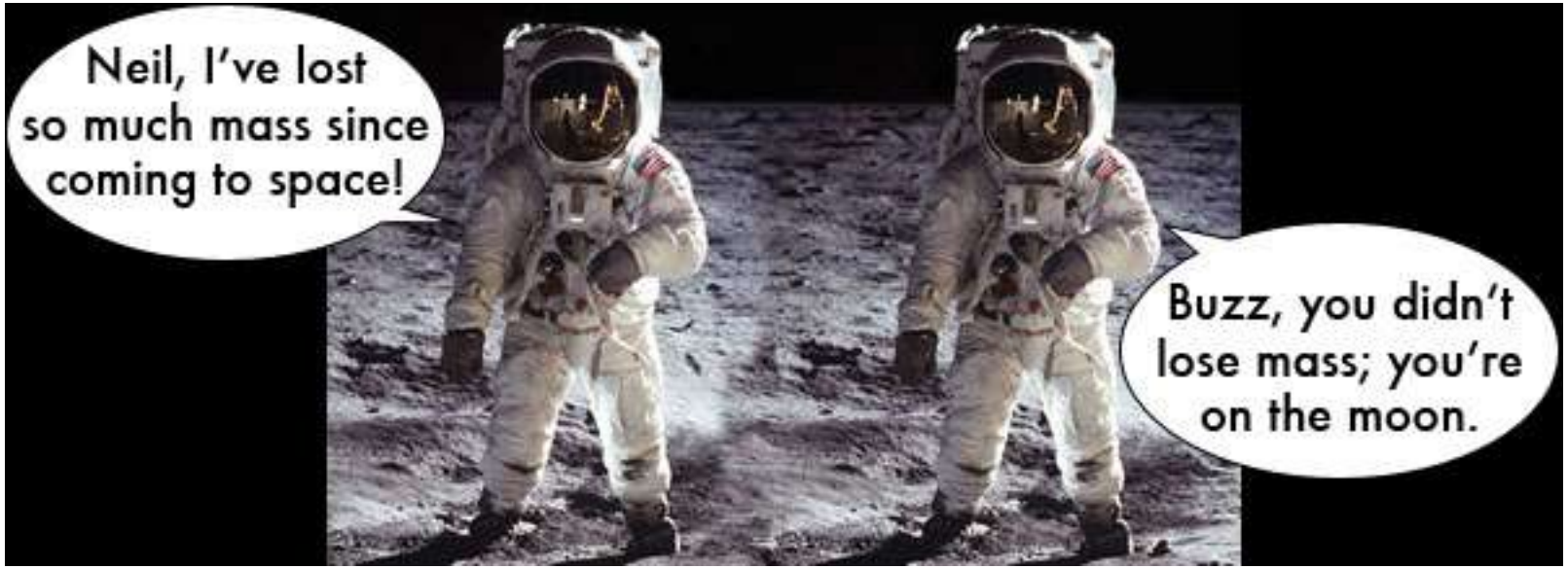
1. Amount of matter *in* an object
2. A ratio that compares the **mass** of an object to its **volume**
3. Affected by the amount of *gravity* pulling on an object
4. Amount of *space an object takes up*

1. A. Mass

2. C. Density

3. D. Weight

4. B. Volume



1. The basic unit for mass

2. The basic unit for length

3. The basic unit for volume

Matching:

A. Meter
B. Gram
C. Liter

1. The basic unit for mass = B. gram

2. The basic unit for length = A. meter

3. The basic unit for volume = C. liter

The thickness of a coin would be approximately 1 ___.

A. Meter

B. Centimeter

C. Millimeter

D. Kilometer

C. Millimeter

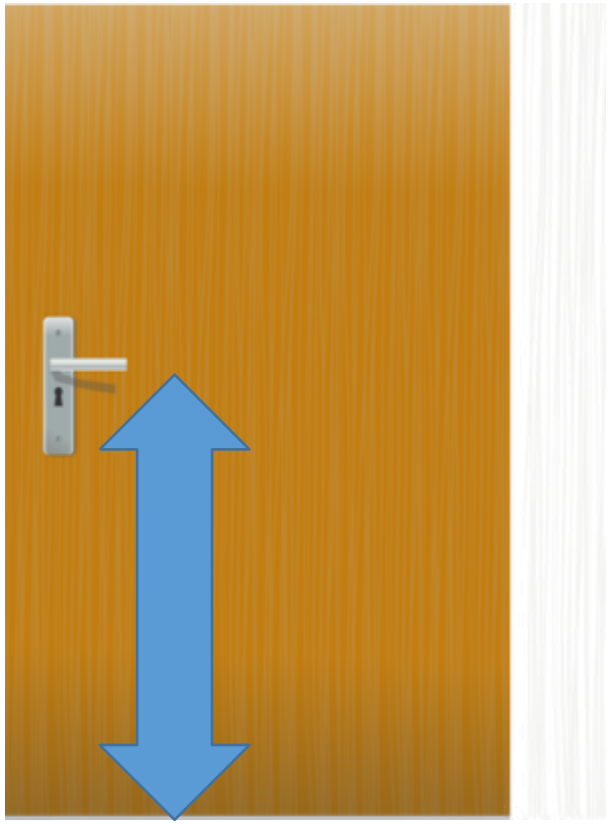
The distance from the door knob to the floor is approximately 1 ___.

A. Meter

B. Centimeter

C. Millimeter

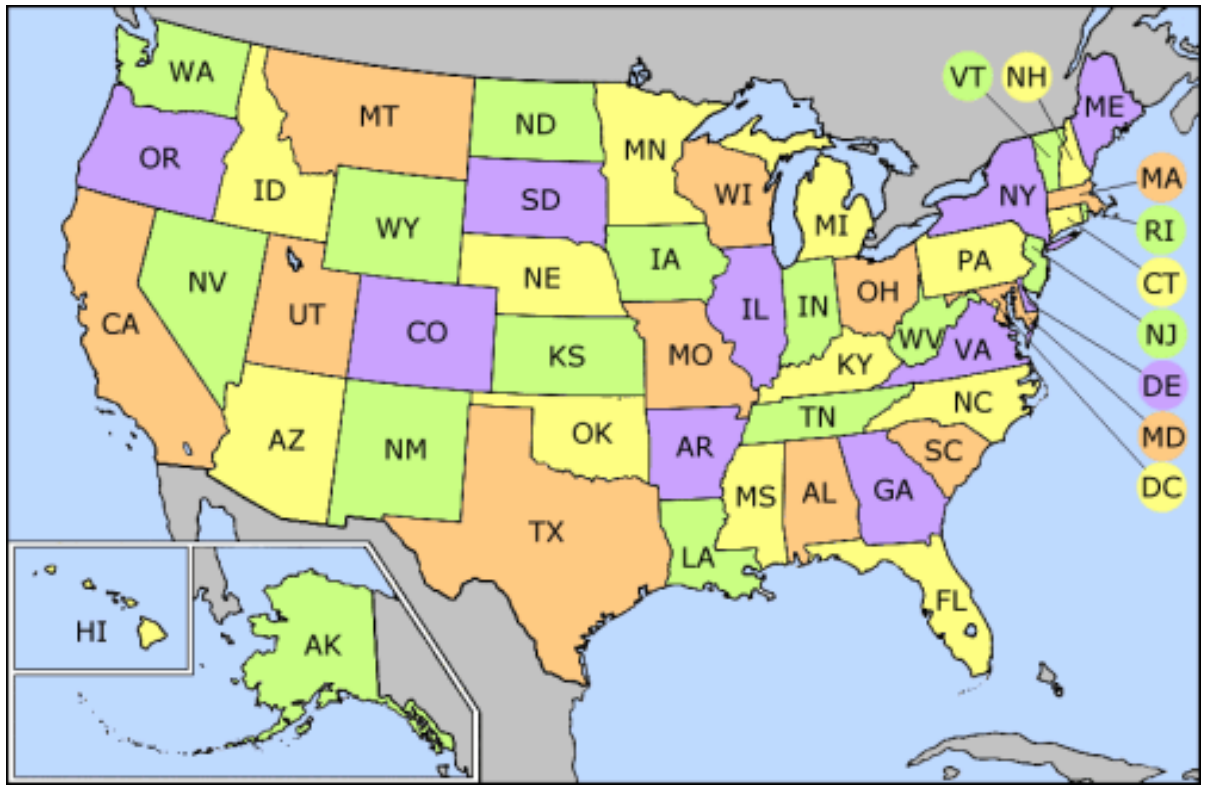
D. Kilometer



A. Meter

A “meter stick” = the distance from the floor to the door handle

If your family was planning a trip from home to California, which unit of measurement would you use to figure out the distance you will travel?



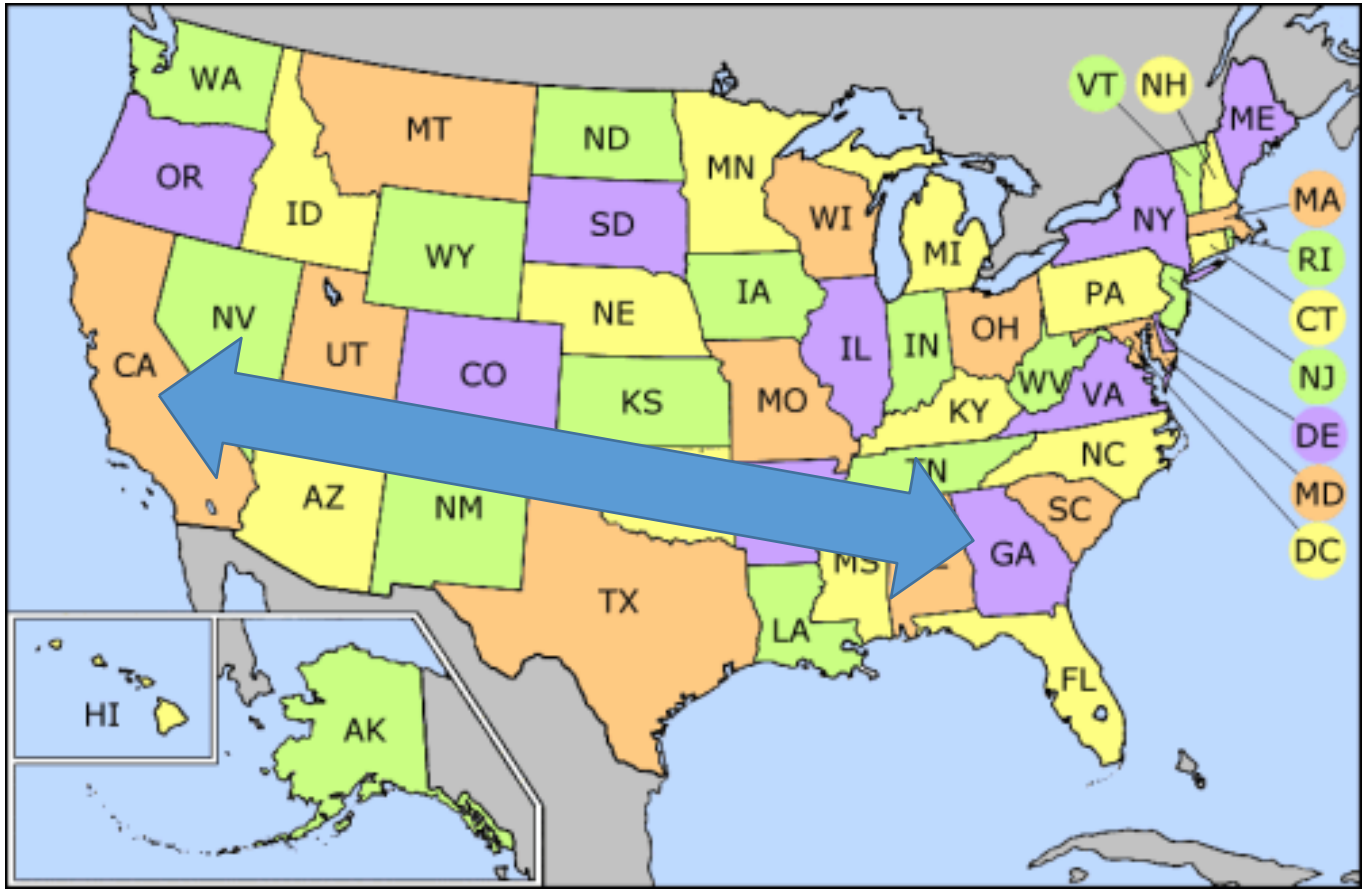
A. Meter

B. Centimeter

C. Millimeter

D. Kilometer

D. Kilometer


WA
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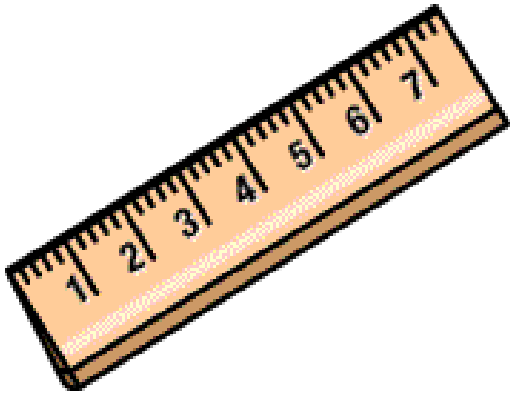
MA
RI
CT
NJ
DE
MD
DC
HI
AK

What is each of these used to measure?
(Answer choices: volume, distance, mass)

Graduated Cylinder

Balance

Meter Stick



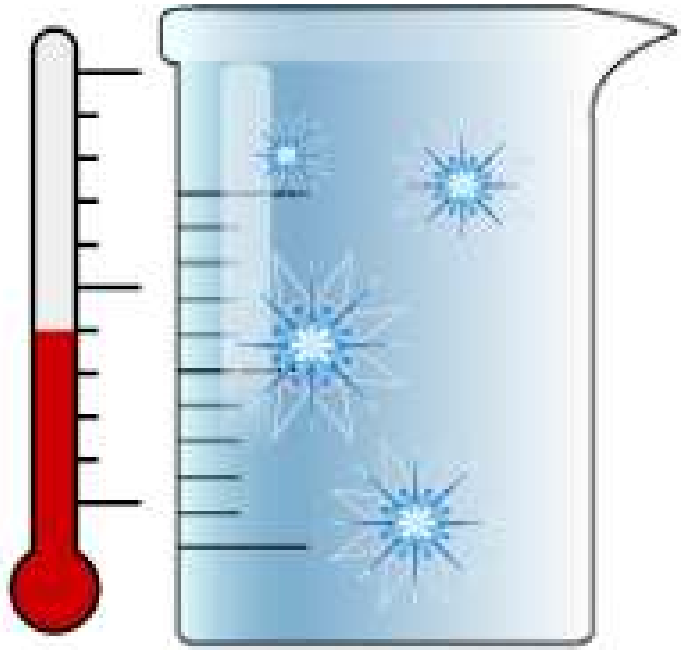
Beaker

Graduated Cylinder	Balance	Meter Stick	Beaker
Volume	Mass	Distance	Volume

What is the freezing point of water using each scale:

Celsius scale = _____

Fahrenheit scale = _____



Celsius scale = 0° C

Fahrenheit scale = 32° F

Complete the metric conversions, using the ‘ladder’

(**K**ing **H**enry **D**oesn’t **U**sually **D**rink **C**hocolate **M**ilk)

1) 3000 mg = ___ g

2) 18 km = ___ m

3) 7 L = ___ mL

4) 550 m = ___ km

5) 150 cm = ___ mm

6) 4000 mm = ___ Km

(**K**ing **H**enry **D**oesn't **U**sually **D**rink **C**hocolate **M**ilk)

1) 3000 mg = 3 g

2) 18 km = 18,000 m

3) 7 L = 7,000 mL

4) 550 m = .55 km

5) 150 cm = 1500 mm

6) 4000 mm = .004 Km

List as many science lab safety rules as you can think of…

GO!

1. No eating or drinking
2. No playing around in the room
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