

MONDAY, DECEMBER 3rd

DO NOW

Know: Scientific tools are specially designed to measure specific things.

Asked: Which of the following sets of tools could a scientist use when trying to measure out portions of a liquid?

A: Scale, Balance, and Spring

B: Erlenmeyer Flask & Graduated Cylinder

C: Centrifuge, Syringe, and Petri Dish

TODAY'S PLAN

1. Do and review the **DO NOW** and **Qualitative Prompt (QP)**!
 - Today's **QP** = LIST and SKETCH as many different things in our world that can be MEASURED as you can!
2. Open books, **WORK** on today's **AO!**
3. ***HW** = Bring In Bring-Ins Item!

TODAY'S ACADEMIC OBJECTIVE

Today you will **MODEL** how to **ENHANCE** your senses with a **Scientific Device!**

DO NOW – Which Tools to Use?

- **Know:** Scientific tools are specially designed to measure specific things.
- **Asked:** Which of the following sets of tools could a scientist use when trying to measure out portions of a liquid?

What is KA² format? This is an example of a “1-pointer” on a DO NOW!

- **Know:**
 - Scientific tools are specially designed to measure specific things.
- **Asked:**
 - Which of the following sets of tools could a scientist use when trying to measure out portions of a liquid?
- **Answer:**
 - **B:** Erlenmeyer Flask & Graduated Cylinder

DO NOW – Translating and Concluding Our Answer!

- **Answer:**
 - **B:** Erlenmeyer Flask & Graduated Cylinder
- **Sci Fact** → Students, **NEVER** be afraid of learning new scientific words and names! It's a **MUST** to know that Erlenmeyer Flasks, Graduated Cylinders, and **BEAKERS** all measure **VOLUME!**

Centrifuge Machines

A centrifuge is a device for separating particles from a solution according to their size, shape, density, viscosity of the medium and rotor speed.



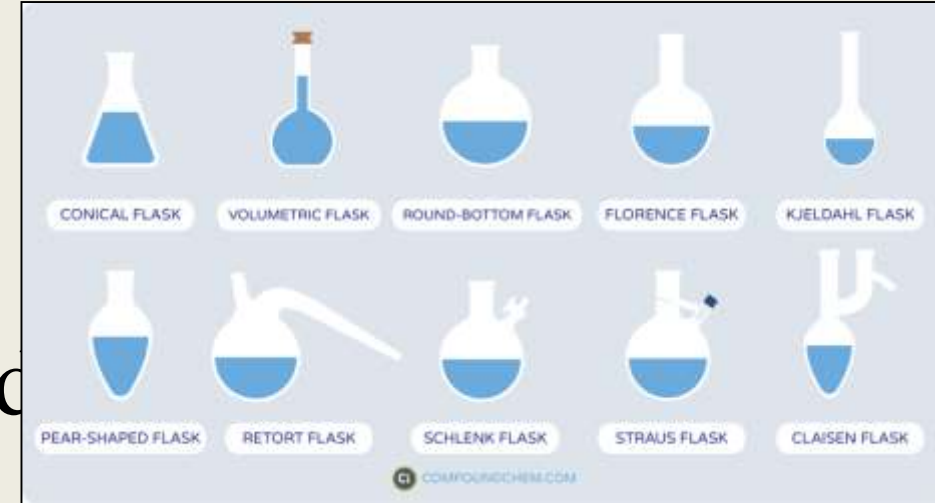
PETRI DISHES

• Function: used to grow cultures of bacteria or any other substance

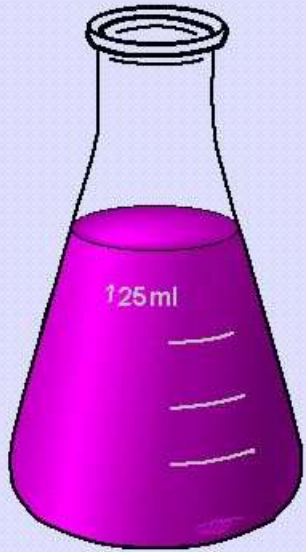


volumetric flask

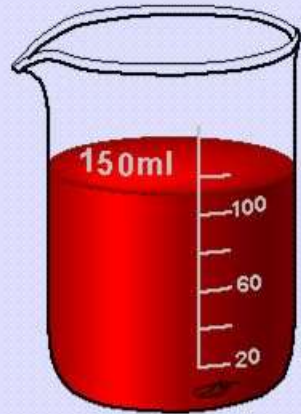
Concluding Our



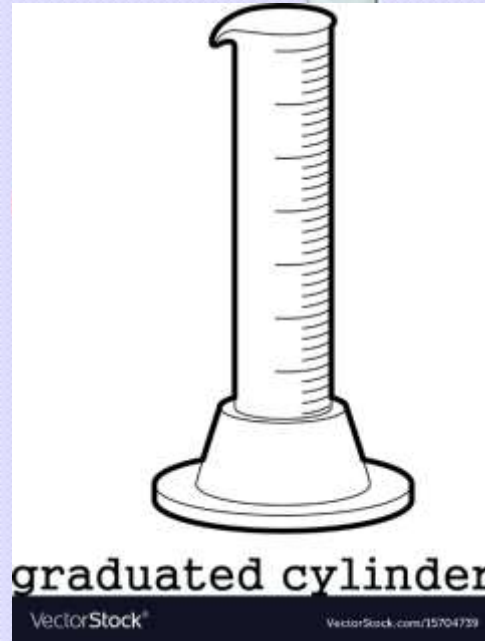
GLASSWARE



Erlenmeyer
Flask



Griffin
Beaker



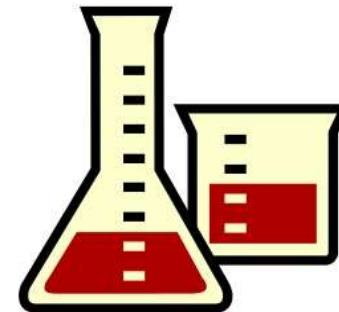
graduated cylinder

Graduated Pipet



What is volume?

I. Volume is the amount of space an object takes up.



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Today you will **MODEL** how to **ENHANCE** your senses with a **Scientific Device!**

Today's Qualitative Prompt

LIST and SKETCH as many different things in our world that can be MEASURED as you can!

- Students, we humans can MEASURE aka “describe with numbers” just about EVERYTHING in our world!


Customary & Metric Units of Measure

Customary Units

The Customary System of Measurement is used primarily in the United States.


Length

1 foot (ft)	12 inches (in.)
1 yard (yd)	3 feet
1 yard	36 inches
1 mile (mi)	1,760 yards
1 mile	5,280 feet




Capacity

1 pint (pt)	2 cups
1 quart (qt)	2 pints
1 quart	4 cups
1 gallon (gal)	4 quarts



Weight


1 pound (lb)	16 ounces (oz)
1 ton (T)	2,000 pounds



Temperature

water freezes	32°F
water boils	212°F
normal body temperature	98.6°F

Degrees Fahrenheit (°F) are customary units of temperature.




Metric Units

The Metric System of Measurement is used primarily in most parts of the world. It is a base-ten system.


Length

1 centimeter (cm)	10 millimeters (mm)
1 decimeter (dm)	10 centimeters (cm)
1 meter (m)	10 decimeters
1 kilometer (km)	1,000 meters




Capacity

1 liter (L)	1,000 milliliters (mL)
10 deciliters (dL)	1 liter (L)



Mass

1 gram (g)	1,000 milligrams (mg)
1 kilogram (kg)	1,000 grams

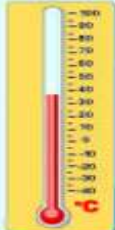


1,000 mg total mass

Temperature


water freezes	0°C
water boils	100°C
normal body temperature	37°C

Degrees Celsius (°C) are metric units of temperature.



Comparing Metric & Customary Measures

Length	Capacity
1 in. = 2.54 cm	1 L = 1.06 qt
1 m = 39.37 in.	1 gal = 3.8 L
1 m = 1.09 yd	
1 km = 0.6 mi	Weight & Mass
1 mi = 1.6 km	1 oz = 28 g
	1 kg = 2.2 lb



Visit www.newpathlearning.com for Online Learning Resources.

Today's Qualitative Prompt

LIST and SKETCH as many different things in our world that can be MEASURED as you can!

- Students, we humans can MEASURE aka “describe with numbers” just about EVERYTHING in our world!

Metric Units and Measurement

Length

10 (mm) millimetres = 1 centimetre
100 (cm) centimetres = 1 metre
1000 (m) metres = 1 (km) kilometre

Did you know!
A new pencil is about 185mm long.

Did you know!
A 2p coin is 2mm thick and 26mm in diameter.

Did you know!
The dimensions of this poster are around 40.5cm by 59.4cm.



Time

60 seconds = 1 minute
60 minutes = 1 hour
24 hours = 1 day
7 days = 1 week
52 weeks = 1 year



1 minute = 60 seconds
1 hour = 3600 seconds
1 day = 86400 seconds
1 week = 604800 seconds
1 year = 31449600 seconds
1 leap year = 31536000 seconds

Did you know!
A year is actually 365.25 days long. This is the time it takes for the Earth to travel once around the Sun. Every 4th year is a leap year where an extra day is added to make up for the extra quarter (0.25) days over 4 years.

Volume

10 (ml) millilitres = 1 (cl) centilitre
100 (cl) centilitres = 1 (l) litre

Did you know!
A cow can produce up to 35 litres of milk per day.



Did you know!
One teaspoon equals about 5 millilitres.

Did you know!
You use 80 litres of water in a bath but only 35 litres in a shower.

Mass

1000 (mg) milligram = 1 gram
1000 (g) grams = 1 (kg) kilogram
1000 (kg) kilograms = 1 (t) tonne

Did you know!
A paperclip weighs about 1 gram.
Did you know!
A field mouse weighs between 16 and 27 grammes.

Did you know!
A litre of water weighs 1 kilogram.



Did you know!
An elephant can weigh up to 5 tonnes (or 5 million paperclips!)

Temperature

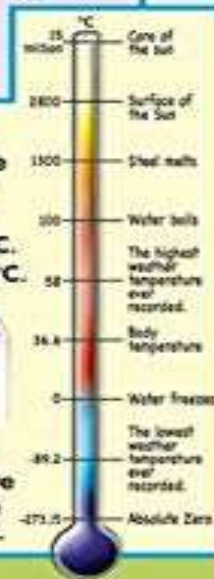
In the metric system temperature is expressed in degrees Celsius. At sea level :
The **freezing point** of water is 0°C.
The **boiling point** of water is 100°C.

Did you know!
A nice hot summer's day is between 20°C to 30°C.

Did you know!
Normal body temperature is around 36.6°C.



Did you know!
The temperature of an ice cream is around -16°C.



Today's Qualitative Prompt

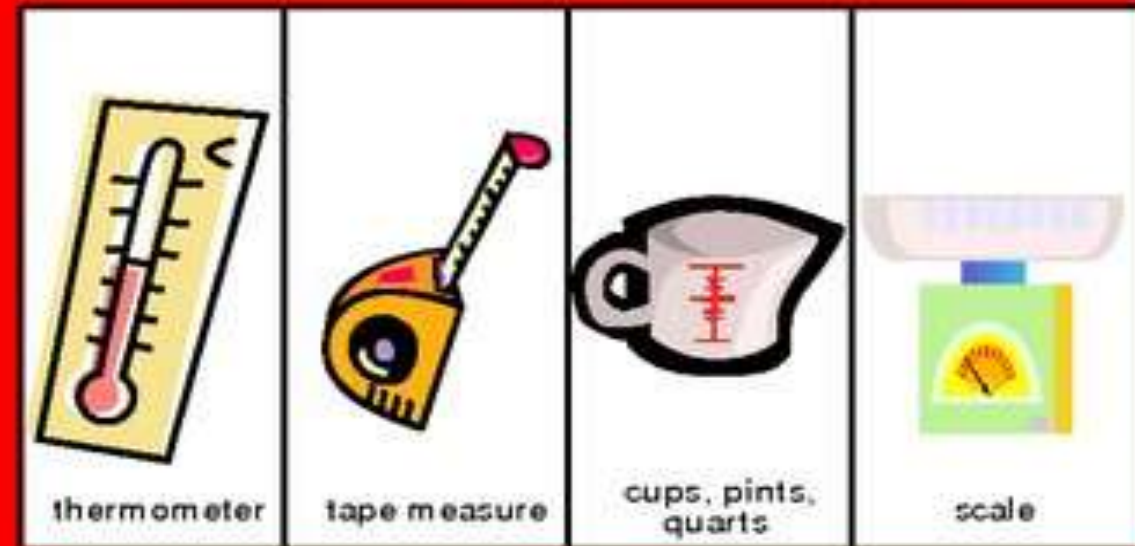
LIST and SKETCH as many different things in our world that can be MEASURED as you can!

- Due to this we scientists have INVENTED countless UNITS and DEVICES to allow us to MEASURE UP all that we come across!

SI Base Units

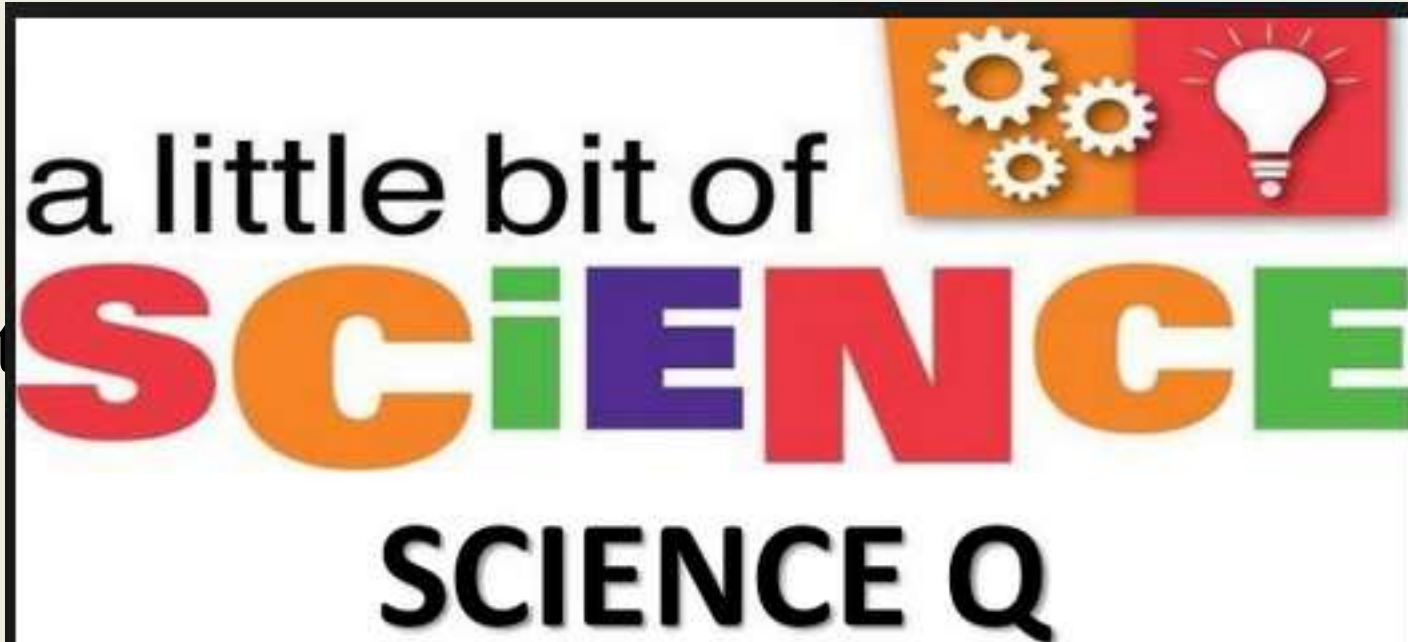
Quantity	Unit	Symbol
Length	meter	m
Mass	kilogram	kg
Temperature	kelvin	K
Time	second	s
Amount of Substance	mole	mol
Electric Current	ampere	A
Luminous Intensity	candela	cd

Which tool do I use?



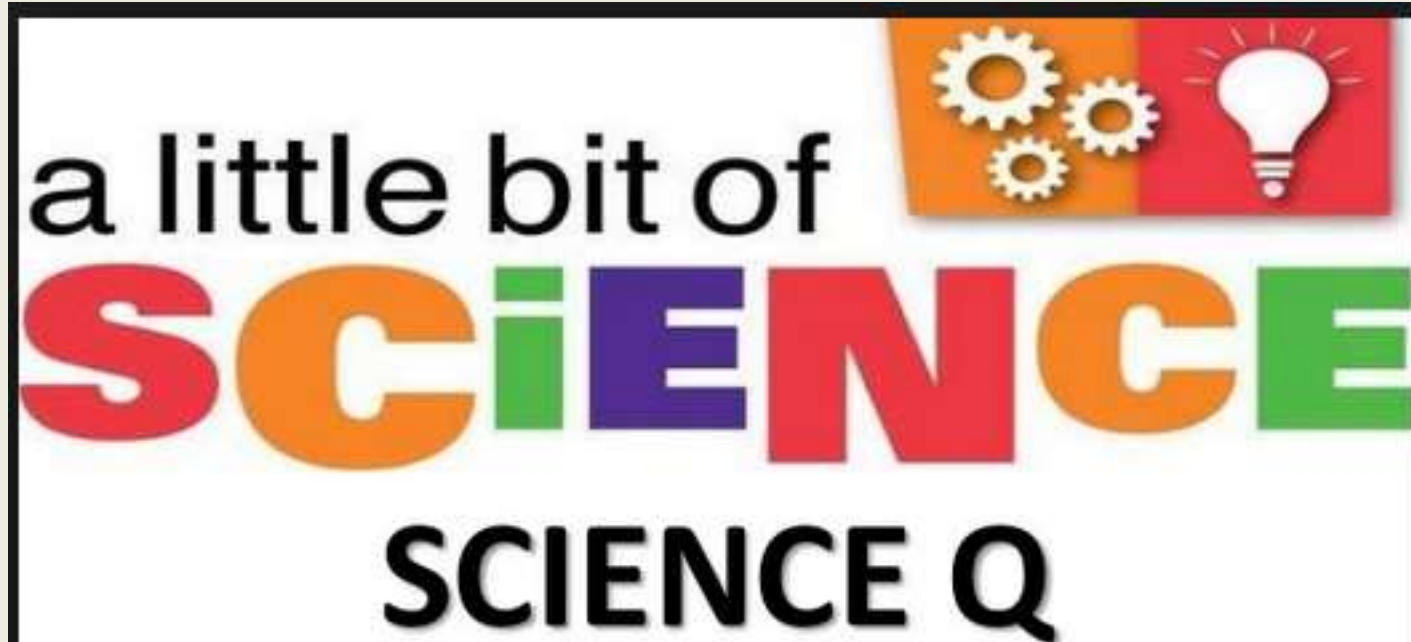
Bell 2 Bell

- We work what in this class?!?!?!
 - **BELL 2 BELL**
- Every single precious **SECOND** of academic instructional time is thus utilized in this classroom!
- You students will thus be vocally quizzed **EVERY DAY** until I **DISMISS** you at the end of class (with a positive greeting and a thank-you of course!).



Bell 2 Bell

- We work **BELL 2 BELL** in Mr. Floyd's class!
- I will thus quiz you about the science we learned today until the very end!
- Let us begin!



Tomorrow's Academic Objective and Plan

- Tomorrow you will DEMONSTRATE how to ENHANCE your senses with a scientific device!
- *HW = Bring In Bring-Ins Item!



Lab Equipment Match and Complete Manipulative
Cut out the pieces below and match the picture with the appropriate name and description. Draw a picture, write a name, or a description for the blank spaces.

– 1 Gadget/Toy/Weird-Shaped Item that is in-between the size of a Golf Ball and Softball!



TUESDAY, DECEMBER 4th

DO NOW

- In your notebooks, to be checked, solve this problem...

There is 1 milliliter in 1 cubic centimeter. These are units of volume!

Know:

$$1mL = 1cm^3$$

Asked: How many cubic centimeters are in 17.86 milliliters?

TODAY'S PLAN

1. Do and review the **DO NOW** and **Qualitative Prompt (QP)**!
 - Today's **QP** = LIST and SKETCH at least 5 different Physical Properties that Matter can have and then WRITE what you think "Chemical Properties" are!
2. Open books, **WORK** on today's **AO!**
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TODAY'S ACADEMIC OBJECTIVE

Today you will **MODEL** how actual Science Experiments are done by **PERFORMING** a Standard Identification-Based Scientific Procedure!

DO NOW – Units of Volume

There is 1 milliliter in 1 cubic centimeter. These are units of volume!

- **Know/Given:**

$$1mL = 1cm^3$$

- **Asked:** How many cubic centimeters are in 17.86 milliliters?

What is KA² format? This is an example of a “1-pointer” on a DO NOW!

- **Know:**

$$1mL = 1cm^3$$

$$\frac{1mL}{1cm^3} \quad \frac{1cm^3}{1mL}$$

- **Asked:** How many cubic centimeters are in 17.86 milliliters?

- **Answer:** $17.86mL * \frac{1cm^3}{1mL} = 17.86cm^3$

DO NOW – Never Forget to Listen to Akila!

- To solve these problems, just multiply by the fraction with the units you want on top and “*Let the Units Guide You*”!

– Example: $84\cancel{in} * \frac{1ft}{12\cancel{in}} = 7ft$



DO NOW – Translating Our Answer

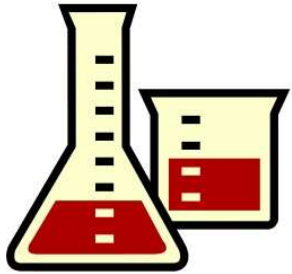
- **Answer:**

$$17.86\cancel{mL} * \frac{1cm^3}{1\cancel{mL}} = 17.86cm^3$$

- **Sci Fact** → Students, this is no typo! Its true! Milliliters and Cubic Centimeters are the SAME thing, since the “Liter” family of units was based off of the Volume of a cube! Why is it cm^3 though?!

What is volume?

I. Volume is the amount of space an object takes up.

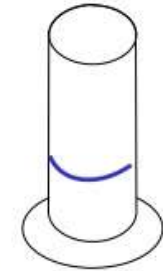
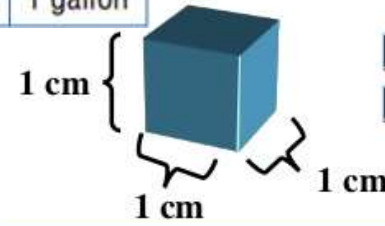


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Customary Units of Liquid Volume

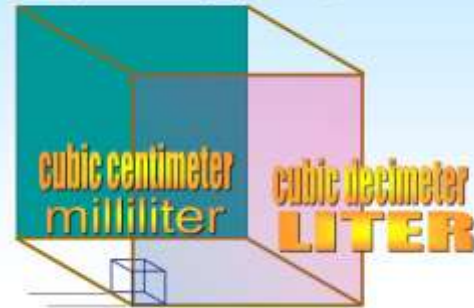
 CUP				
1 cup = 8 fluid ounces	1 pint	1 quart	1 half gallon	1 gallon

Equal Volumes



1 milliliter

1 gram defined as the mass of one cubic centimeter of water (or one milliliter [mL] of water...)



Volume = length x width x height
 $1 \text{ cm}^3 = 1 \text{ cm} \times 1 \text{ cm} \times 1 \text{ cm}$
 cc means cubic centimeter

1.00 ml = 1.00 cc
 1000 ml = 1000 cc = 1.0 liter

17.86 ml

Cubic decimeter = LITER

cubic centimeter

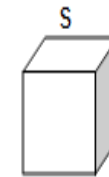
decimeter

1 centimeter

nts this is no typo! If
 ters are t

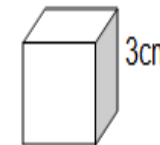
Metric Volume Units Liquid volume

- 1 ml = .001 L
- 1 centiliter (cl) = .01 L
- 1 deciliter (dl) = .1 L
- 1 decaliter (dal) = 10 L
- 1 hectoliter (hl) = 100 L
- 1 kiloliter (kl) = 1000 L



Volume = s^3

Example:



Volume = s^3
 Volume = $(3 \text{ cm})^3$
 Volume = $(3 \text{ cm} \cdot 3 \text{ cm} \cdot 3 \text{ cm})$
 Volume = 27 cm^3

Volume units are always cubed.

TUESDAY, DECEMBER 4th

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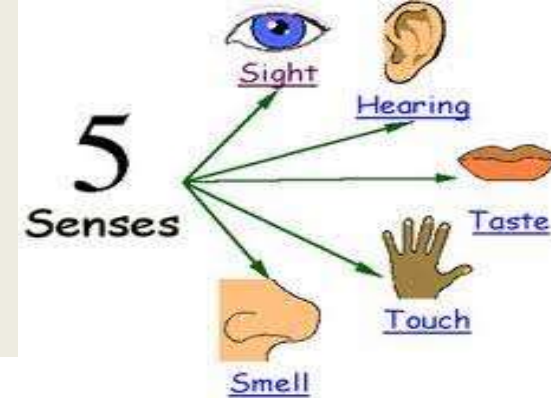
TODAY'S ACADEMIC OBJECTIVE

Today you will **MODEL** how actual Science Experiments are done by **PERFORMING** a Standard Identification-Based Scientific Procedure!

Today's Qualitative Prompt

LIST and SKETCH at least 5 different Physical Properties that Matter can have and then WRITE what you think “Chemical Properties” are!

- Students, “Physical Properties” are simply ANYTHING about a piece of MATTER that can be OBSERVED or MEASURED without changing its “Chemical Composition” aka Atoms!



Observations

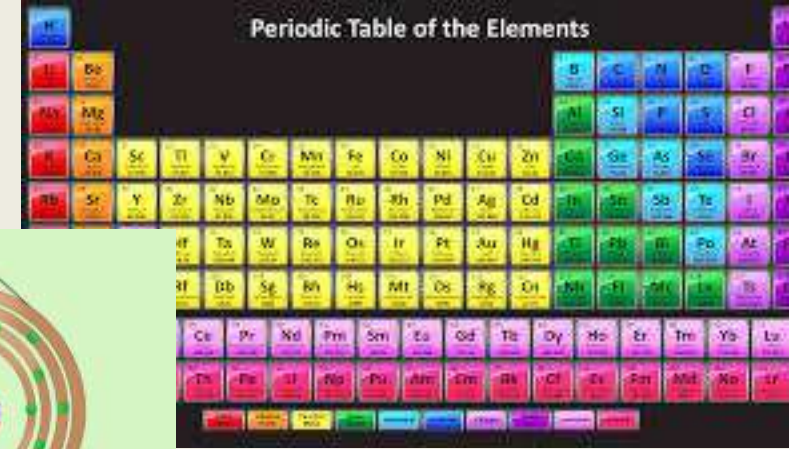
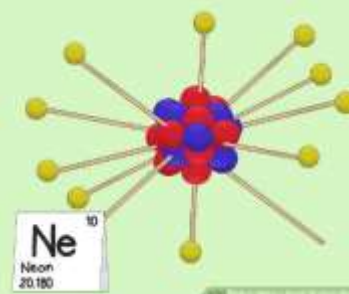
- Gathered through your **senses**
 - A scientist notices something in their **natural world**
 - Write an example of an observation.
-
-



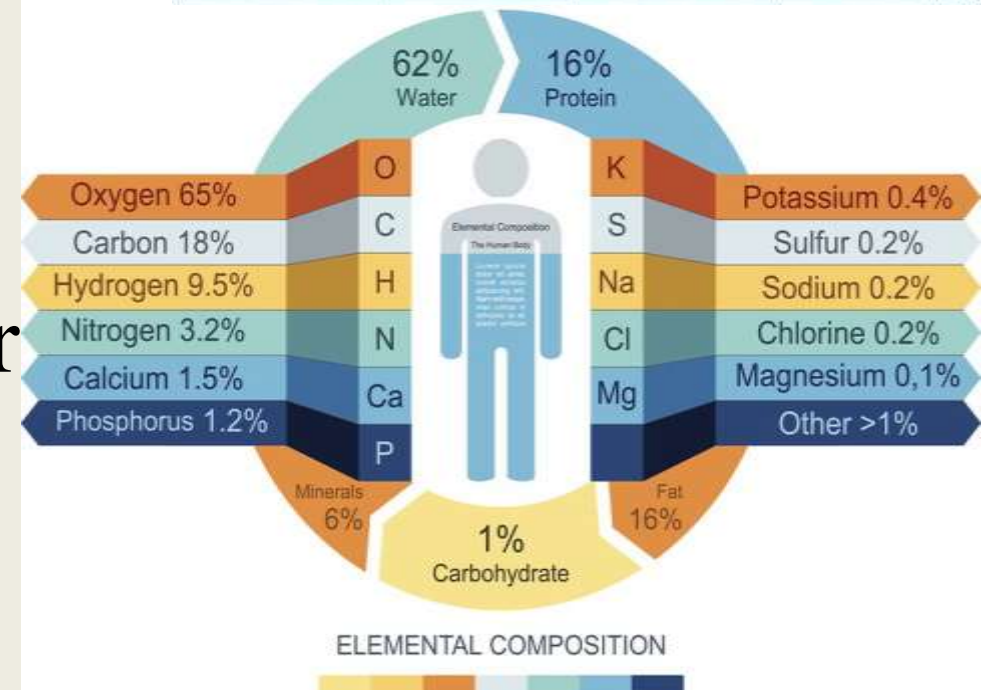
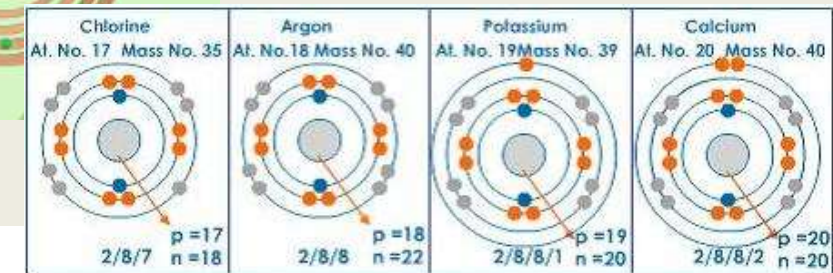
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Periodic Table of the Elements



Today's Qualitative Prompt

LIST at least 5 different Physical Properties that Matter can have and then WRITE what you think "Chemical Properties" are!

- Due to this, there are A LOT of Physical Properties that we can Measure and Observe such as Color, Melting Point, Strength, DENSITY, AND more!

Examples of physical properties

• Color



• Shape



• Odor



• Mass



• Volume



• Magnetism



• Conducting electricity



• strength



• flexibility



Physical Properties

Quartz

Crystal Shape

Luster

Color

Streak

Hardness

Cleavage

Fracture

Specific Gravity



Hexagonal

Nonmetallic (Vitreous)

Clear to Milky

No Streak

H = 7

No Cleavage

Conchoidal

S.P. = 2.65

Today's Qualitative Prompt

LIST at least 5 different Physical Properties that Matter can have and then WRITE what you think “Chemical Properties” are!

- However, knowing that “Chemical Composition” refers to the ATOMS Matter has we can thus learn that a “Chemical Property” is a property related to Matter undergoing a Chemical REACTION!

Chemical Properties

•Property of matter that describes a substances ability to participate in chemical reactions. (Change into new matter.)

–Flammability

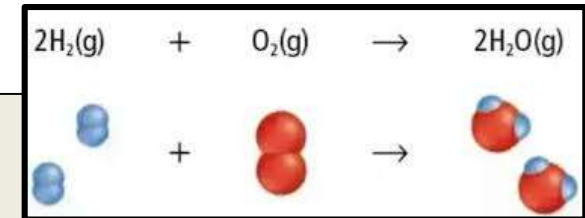
- ability to burn

- Burning wood creates ash and smoke

–Reactivity

- ability of two or more substances to combine and form a new substance

- Oxygen and iron create rust



Physical vs. Chemical Properties

• Physical Properties • Chemical Properties

- Color
- Shape
- Size
- Density
- Amount
- Volume



- Flammability
- Rusting
- Burning
- Corrosion
- Reactivity

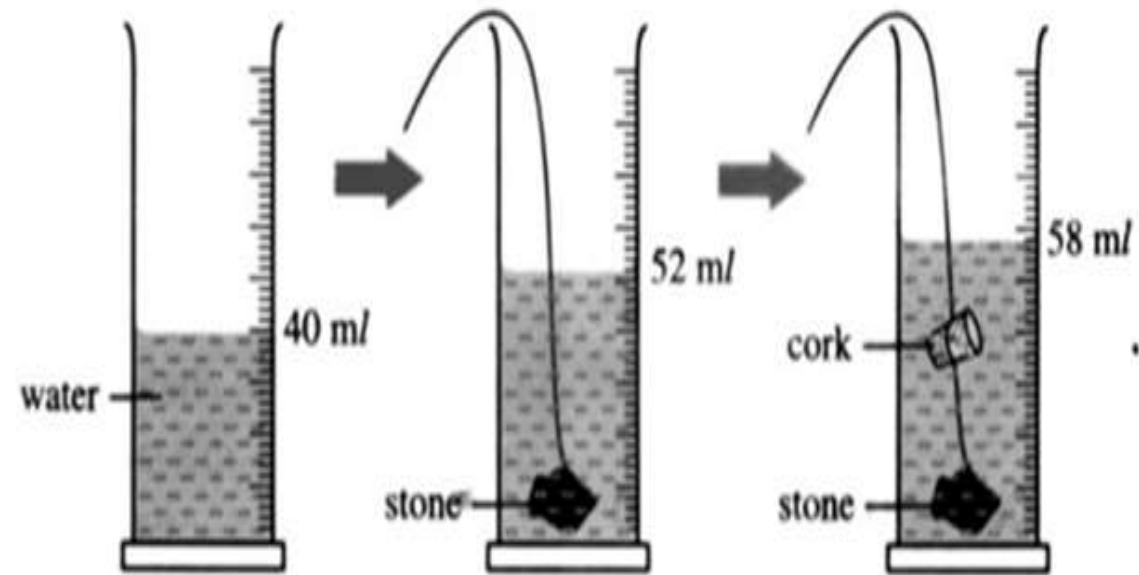


Measuring Density – Jot This Down!

- To find the DENSITY of an object, you must first MEASURE its MASS and VOLUME!

- Mass is “how much matter” an object has, and it is usually measured with a “Triple Beam BALANCE”!
- Volume is “how much space” an object takes up, and it can be measured with a formula (if it has a defined shape!) OR with the “Water Displacement Method”!

Estimating the volume of a cork



$$\begin{aligned}\text{Volume of the cork} &= (58 - 52) \text{ ml} \\ &= 6 \text{ ml} \\ &= 6 \text{ cm}^3\end{aligned}$$

WATER DISPLACEMENT METHOD

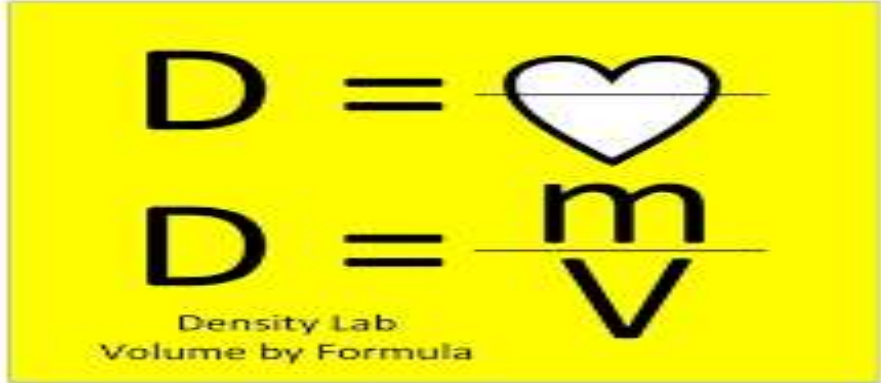
Measuring Density – Jot This Down!

Once you have the MASS and VOLUME of an Object, all you need to do to find the Density is to “plug and chug” these numbers into the DENSITY FORMULA!

$$D = \frac{m}{V}$$



Density calculations

- Density = Mass / Volume
- Everybody LOVES Density



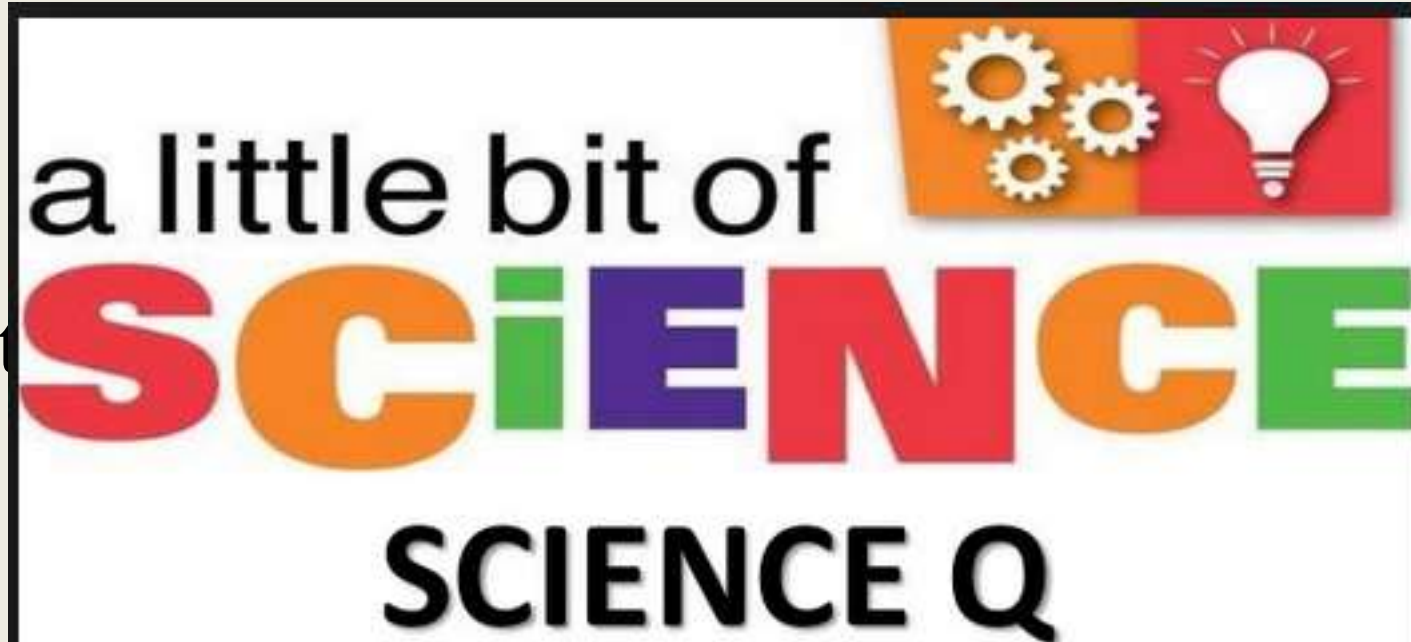
Density Lab:
Volume by Formula

What is Density?

Density is....	Which is denser?
<ul style="list-style-type: none">• "Mass per unit volume"• How closely packed the "stuff" is within an object.	
<ul style="list-style-type: none">• If something is <i>more dense</i> that means more <i>stuff</i> is taking up that objects space, and is more closely packed.	

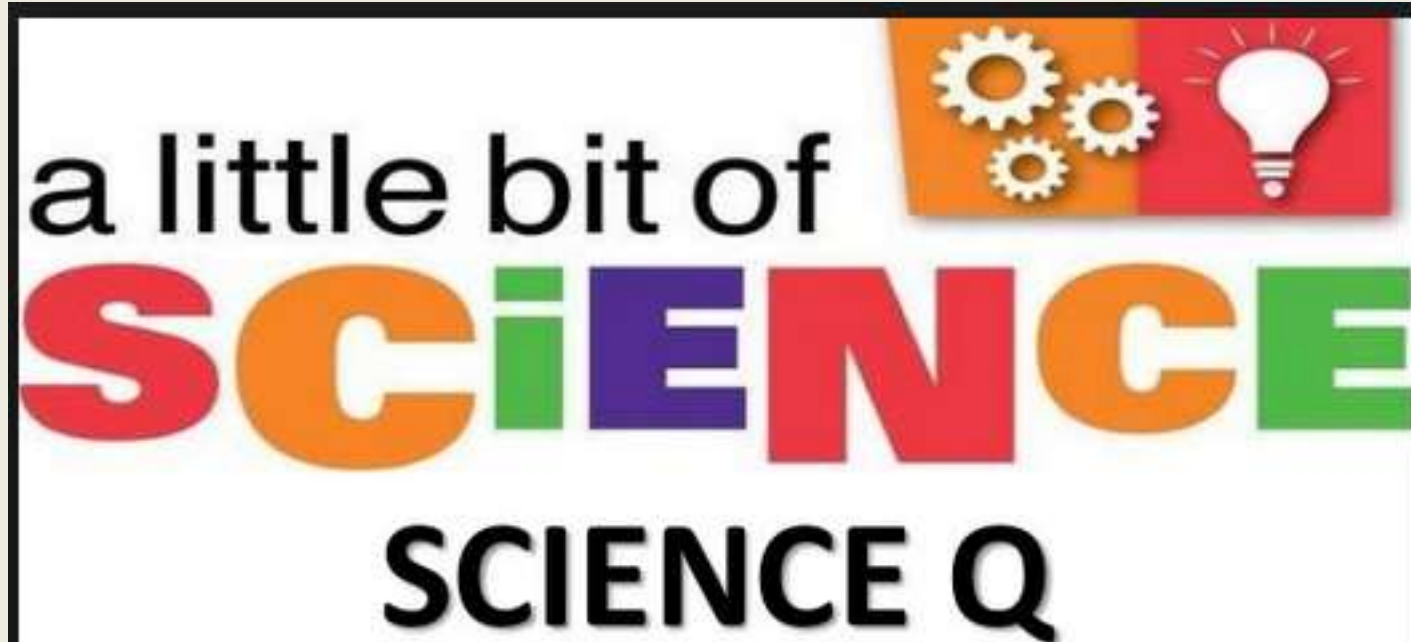
Bell 2 Bell

- We work what in this class?!?!?!
 - **BELL 2 BELL**
- Every single precious **SECOND** of academic instructional time is thus utilized in this classroom!
- You students will thus be vocally quizzed **EVERY DAY** until I **DISMISS** you at the end of class (with a positive greeting and a thank-you of course!).



Bell 2 Bell

- We work **BELL 2**
BELL in Mr. Floyd's class!
- I will thus quiz you about the science we learned today until the very end!
- Let us begin!



Tomorrow's Academic Objective and Plan

- Tomorrow you will MODEL how actual Science Experiments are done by PERFORMING a Standard Identification-Based Scientific Procedure!
- *HW = Finish Jot-Down Notes!



Jot This Down!



WEDNESDAY, DECEMBER 5th

DO NOW

Know: Bead X has a Density of $1.38 \frac{g}{cm^3}$, Bead Y has a Density of $0.90 \frac{g}{cm^3}$, and the Density of Water is $1 \frac{g}{cm^3}$.

Asked: What will happen when you put a mixture of 200 beads into water?

A: Both beads will float

B: Bead X will sink, Bead Y will float

C: Bead Y will sink, Bead X will float

TODAY'S PLAN

1. Do and review the **DO NOW** and **Qualitative Prompt (QP)**!
 - Today's **QP** = LIST and SKETCH 5 things you think are really Dense, 5 that you THINK aren't, and then WRITE what you think happens to the Density of two things when they're combined!
2. Open books, **WORK** on today's **AO!**
3. ***HW** = Finish Bring-Ins Lab!

TODAY'S ACADEMIC OBJECTIVE

Today you will **MODEL** how actual Science Experiments are done by **PERFORMING** a Standard Identification-Based Scientific Procedure!

DO NOW – It'll Never Be Dense In Here!

- **Know:** Bead X has a Density of $1.38 \frac{g}{cm^3}$,
Bead Y has a Density of $0.90 \frac{g}{cm^3}$, and the
Density of Water is $1 \frac{g}{cm^3}$.
- **Asked:** What will happen when you put a
mixture of 200 beads into water?

What is KA² format? This is an example of a “1-pointer” on a DO NOW!

- **Know:**

- Bead X has a Density of $1.38\frac{g}{cm^3}$, Bead Y has a Density of $0.90\frac{g}{cm^3}$, and the Density of Water is $1\frac{g}{cm^3}$.

- **Asked:**

- What will happen when you put a mixture of 200 beads into water?

- **Answer:**

- **B:** Bead X will sink, Bead Y will float

DO NOW – Translating and Concluding Our Answer!

- **Answer:**
 - **B:** Bead X will sink, Bead Y will float
- **Sci Fact** → Students, not all plastics are created equal, even if most float! **DENSITY** is a **PHYSICAL PROPERTY** unique to every specific plastic, but **ANYTHING** Denser than Water will still **SINK** while anything **LESS** Dense will **FLOAT!**



TYPE OF PLASTICS



WHICH TYPE OF PLASTIC WE CAN USE



N



WHICH TYPE OF PLASTIC WE SHOULD NOT USE



PLASTIC RESIN CODES



PETE



HDPE



V



LDPE



PP



PS



OTHER



ill float

ols

- Water has a density of 1.0 g/cm³
- If an object has less density than water, it floats
- If an object has a greater density than water, it sinks



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 - Today's **QP** = LIST and SKETCH 5 things you think are really Dense, 5 that you THINK aren't, and then WRITE what you think happens to the Density of two things when they're combined!
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3. ***HW** = Finish Bring-Ins Lab!

TODAY'S ACADEMIC OBJECTIVE

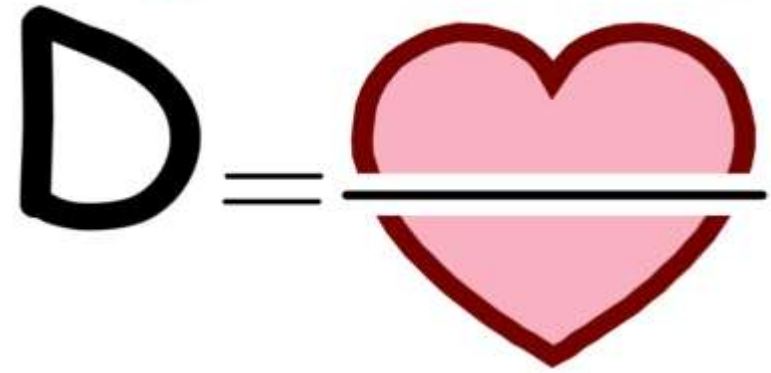
Today you will **MODEL** how actual Science Experiments are done by **PERFORMING** a Standard Identification-Based Scientific Procedure!

Today's Qualitative Prompt

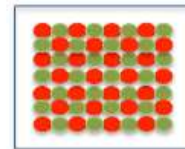
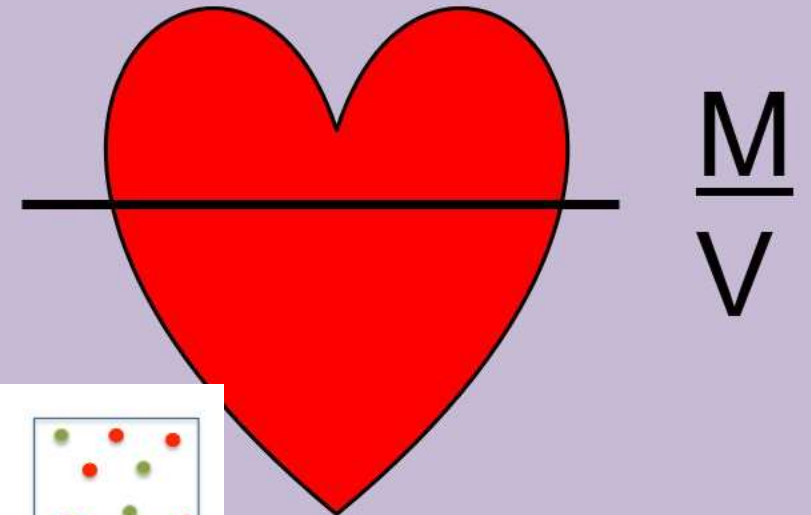
LIST and SKETCH 5 things you think are really dense, 5 that you THINK aren't, and then WRITE what you think happens to the Density of two things when they're combined!

- Students, recall that Density is a measure of “compactness”, and that it is equal to Mass DIVIDED by Volume!

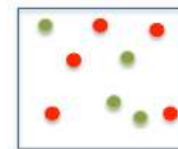
You've got to LOVE your Density!!!



Don't forget the formula for density, or you will break Chef Floyd's heart!



High Density



Low Density

Today's Qualitative Prompt

LIST and SKETCH 5 things you think are really Dense, 5 that you THINK aren't, and then WRITE what you think happens to the Density of two things when they're combined!

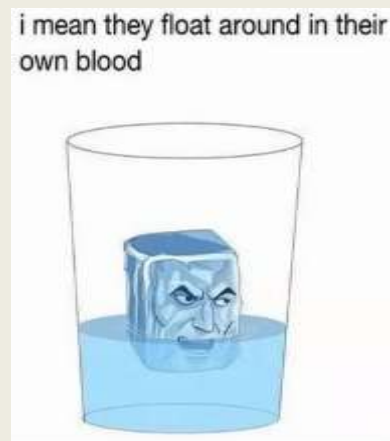
- We should thus already be familiar with what's DENSE and what's not!



Today's Qualitative Prompt

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- We should thus already be familiar with what's DENSE and what's not!



Today's Qualitative Prompt

LIST and SKETCH 5 things you think are really Dense, 5 that you THINK aren't, and then WRITE what you think happens to the Density of two things when they're combined!

- However, we might not know that the DENSITY of two substances is equal to the WEIGHTED AVERAGE of each substance's own Density!

Average Problem Formulas

$$\text{Average} = \frac{\text{Sum of Terms}}{\text{Number of Terms}}$$

$$\text{Weighted Average} = \frac{\text{Sum of Weighted Terms}}{\text{Number of Terms}}$$

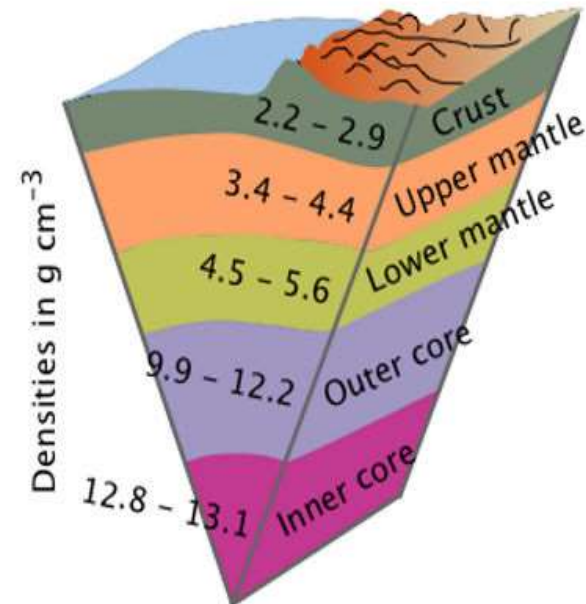


$$\text{Weighted Average Formula} = W_1X_1 + W_2X_2 + \dots + W_nX_n$$

$w = \text{relative weight}(\%)$
 $x = \text{value}$

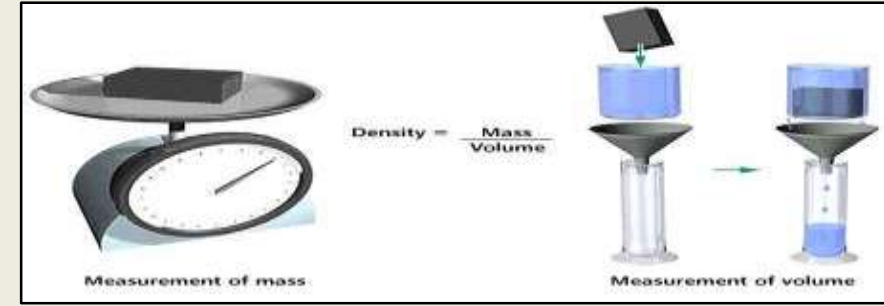
Earth / Density

5.51 g/cm³

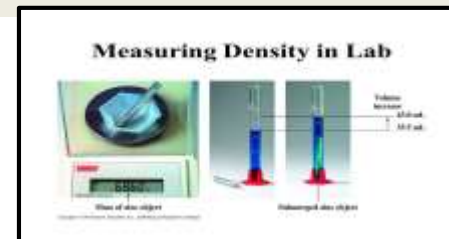
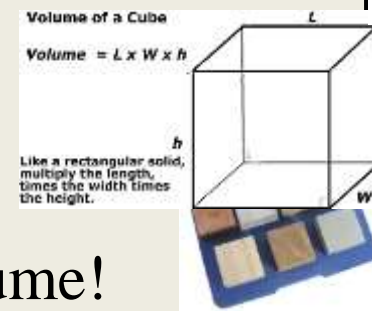


Bring-In's Lab Steps – Toy Space Rocks

1. First, get out your Science Notebooks and JOT-DOWN these few notes about how to measure DENSITY!
2. Next, JOT-DOWN this table and LISTEN UP as I tell you a quick little story about how the phrase “Eureka” was coined!
3. Then, break up into groups and PRACTICE measuring the Density of an object by finding the MASS and VOLUME of one of the Density Cubes and then CALCULATING its Density using $D = \frac{m}{V}$!
4. Note! Use BOTH the Cube Formula (length*width*height*) and the Water DISPLACEMENT Method to find the Volume!
5. Finally, repeat Step 3 with the ITEM you BROUGHT-IN, making sure to APPROXIMATE its Volume via the Displacement Method and ANSWER the HW Probs & Questions!

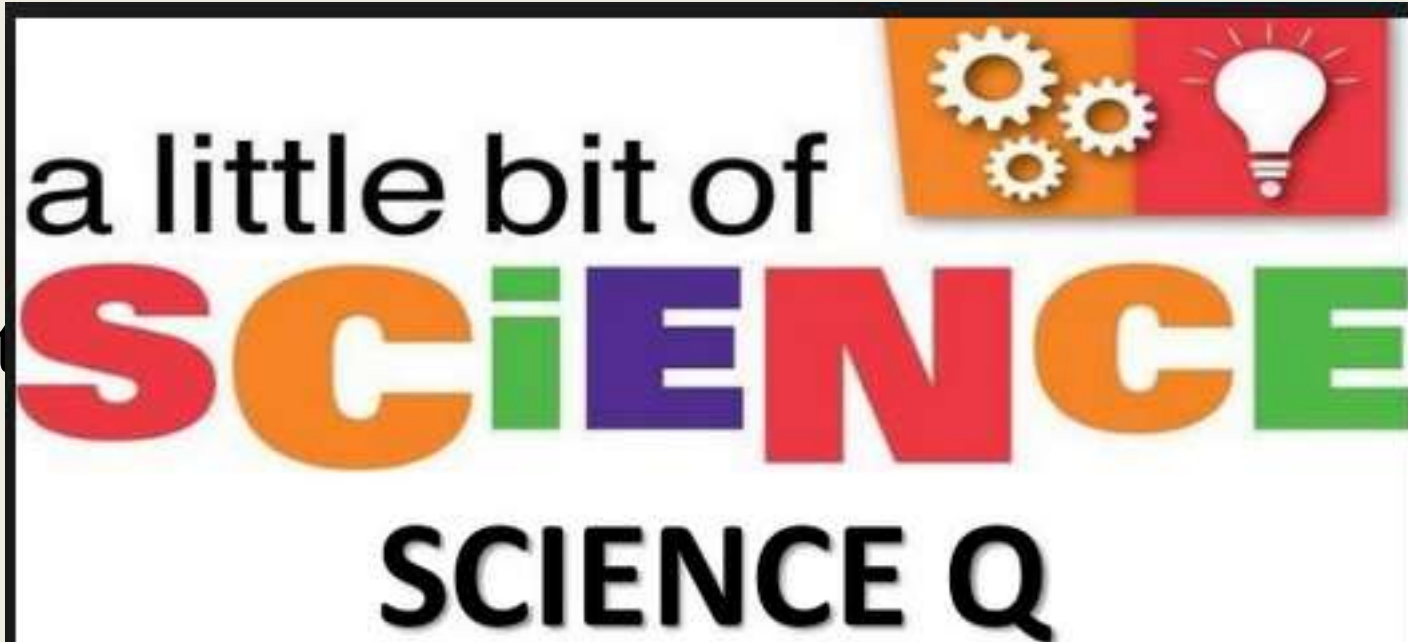


Object	Mass (g)	Volume (mL=cm ³)	Density ($\frac{g}{mL} = \frac{g}{cm^3}$)
Cube (Formula)			
Cube (Water Displ.)			
Bring-Ins item			



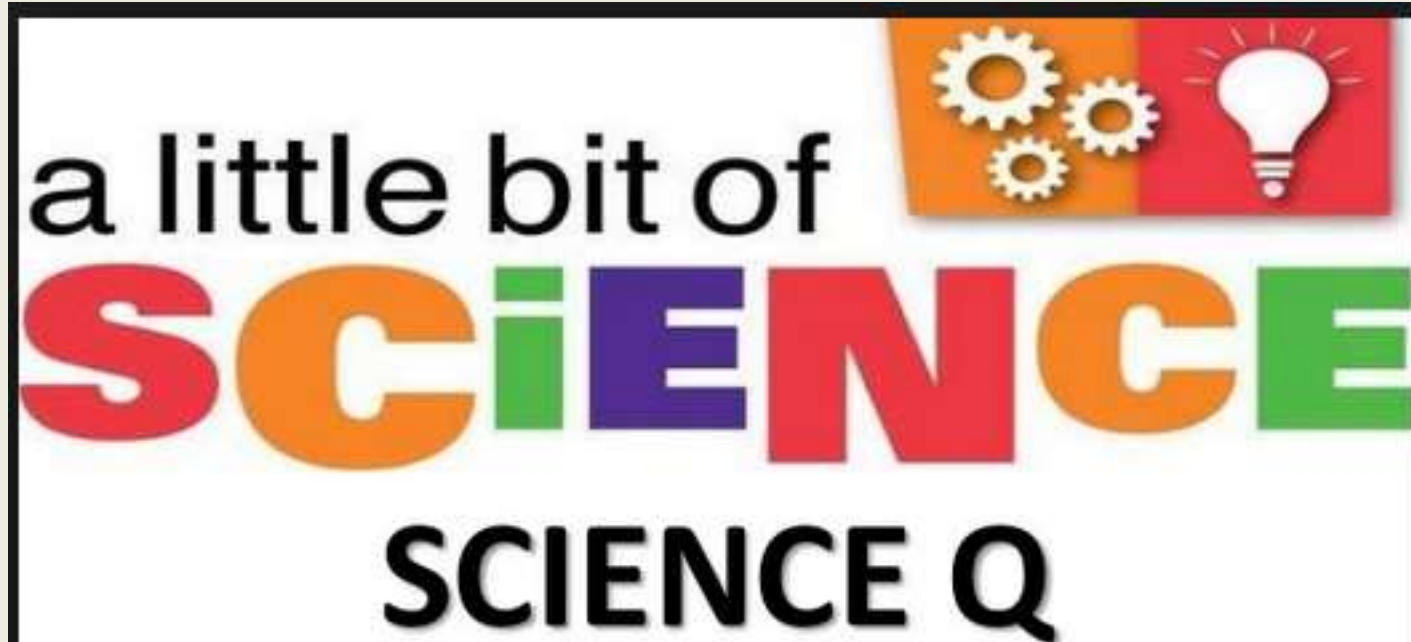
Bell 2 Bell

- We work what in this class?!?!?!
 - **BELL 2 BELL**
- Every single precious **SECOND** of academic instructional time is thus utilized in this classroom!
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Bell 2 Bell

- We work **BELL 2 BELL** in Mr. Floyd's class!
- I will thus quiz you about the science we learned today until the very end!
- Let us begin!



Tomorrow's Academic Objective and Plan

- Tomorrow you will LEARN how to use the Scientific Method to INQUIRE about the Universe!
- *HW = Finish Bring-Ins Lab!

$$\text{density} = \frac{\text{mass}}{\text{volume}}$$



THURSDAY, DECEMBER 6^h

DO NOW

- In your notebooks, to be checked, solve this problem...

There are 1000 milliliters in 1 liter. These are units of volume!

Know:

$$1000mL = 1L$$

Asked: How many milliliters are in 5000 liters?

TODAY'S PLAN

1. Do and review the **DO NOW** and **Qualitative Prompt (QP)**!
 - Today's **QP** = DRAW yourself tossing a SCHOOL BUS and an ICE CUBE into the Susquehanna River and then DESCRIBE and EXPLAIN which one you think will FLOAT!
2. Open books, **WORK** on today's **AO**!
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TODAY'S ACADEMIC OBJECTIVE

Today you will **MODEL** how actual Science Experiments are done by **PERFORMING** a Standard Identification-Based Scientific Procedure!

DO NOW – Units of Volume

There are 1000 milliliters in 1 liter. These are units of volume!

- **Know:**

$$1000mL = 1L$$

- **Asked:** How many milliliters are in 5000 liters?

**What is KA² format? This is an example of a “1-pointer”
on a DO NOW!**

• **Know:**

$$\begin{array}{r} 1000mL = 1L \\ \hline 1000mL \qquad 1L \\ \hline 1L \qquad 1000mL \end{array}$$

• **Asked:** How many milliliters are in 5000 liters?

• **Answer:** $5000L * \frac{1000mL}{1L} = 5,000,000mL$

DO NOW – Never Forget to Listen to Akila!

- To solve these problems, just multiply by the fraction with the units you want on top and “*Let the Units Guide You*”!

– Example: $84\cancel{in} * \frac{1ft}{12\cancel{in}} = 7ft$



DO NOW – Translating Our Answer

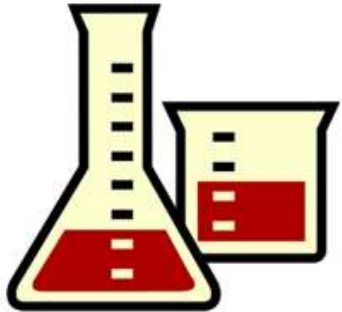
- **Answer:**

$$5000\cancel{L} * \frac{1000mL}{1\cancel{L}} = 5,000,000mL$$

- **Sci Fact** → Students, NEVER FORGET to listen to AKILA and you'll never get confused when converting units! Also, this is a decent amount of volume but its no where NEAR the size of Earth's oceans!

What is volume?

I. **Volume** is the amount of space an object takes up.



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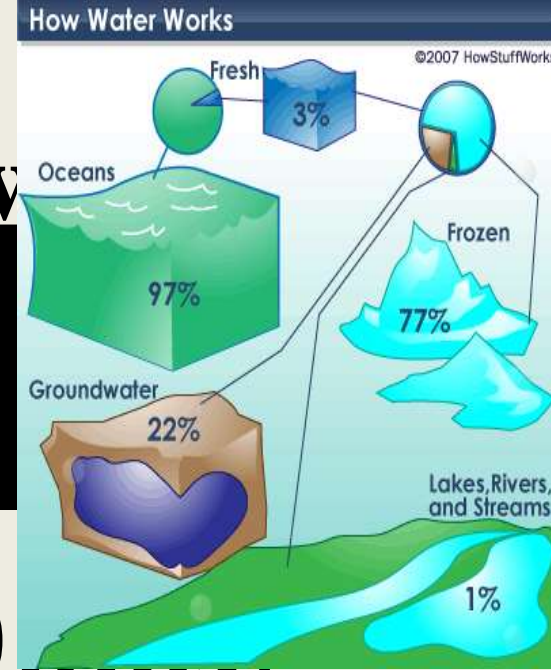
Metric Volume Units

Liquid volume

- 1 ml = .001 L
- 1 centiliter (cl) = .01 L
- 1 deciliter (dl) = .1 L
- 1 decaliter (dal) = 10 L
- 1 hectoliter (hl) = 100 L
- 1 kiloliter (kl) = 1000 L

Fr

r Ansv



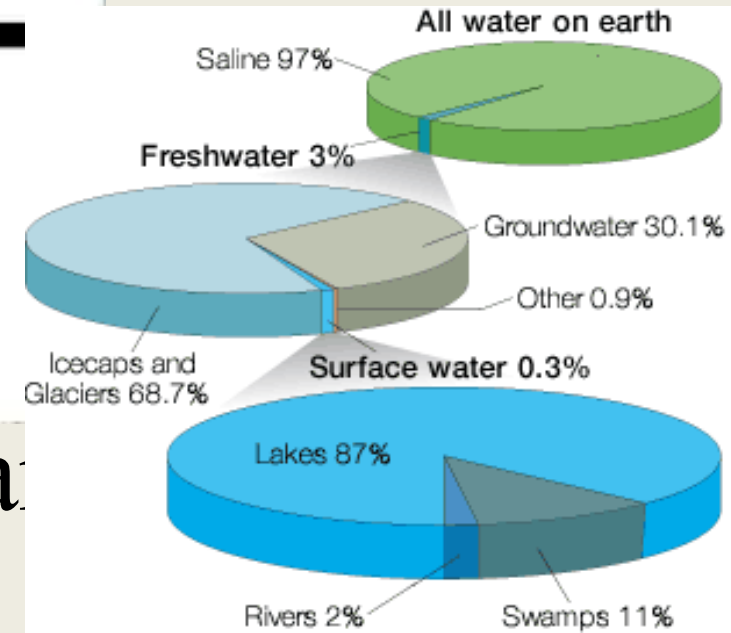
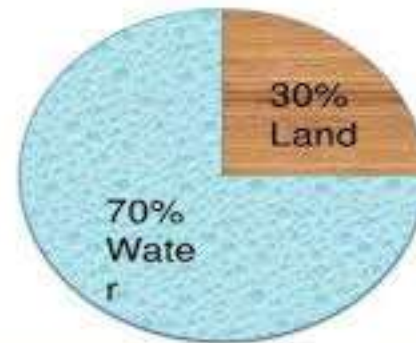
(1 cm³ = 1 mL)

Space Place
in a Snap!



How much water is on Earth?

R the size of Ea



THURSDAY, DECEMBER 6^h

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- In your notebooks, to be checked, solve this problem...

There are 1000 milliliters in 1 liter. These are units of volume!

Know:

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Today you will **MODEL** how actual Science Experiments are done by **PERFORMING** a Standard Identification-Based Scientific Procedure!

Today's Qualitative Prompt

DRAW yourself tossing a SCHOOL BUS and an ICE CUBE into the Susquehanna River and then DESCRIBE which one you think will FLOAT!

- Students, if you BELIEVE in yourselves you'll be surprised how STRONG you really are!



Today's Qualitative Prompt

DRAW yourself tossing a SCHOOL BUS and an ICE CUBE into the Susquehanna River and then DESCRIBE which one you think will FLOAT!

- So after tossing these into the river, you might be SURPRISED to find that they BOTH will FLOAT!



Today's Qualitative Prompt

DRAW yourself tossing a SCHOOL BUS and an ICE CUBE into the Susquehanna River and then DESCRIBE which one you think will FLOAT!

- Thus, knowing that ANYTHING with a Density LESS than Water will float in it, we can learn that the BUS will FLOAT since the OVERALL Density of all of its parts and the AIR inside is LESS than the Water...

Will it sink or float?

- If an object has a density greater than water (1.0), it will sink.
- If an object has a density less than water (1.0), it will float.

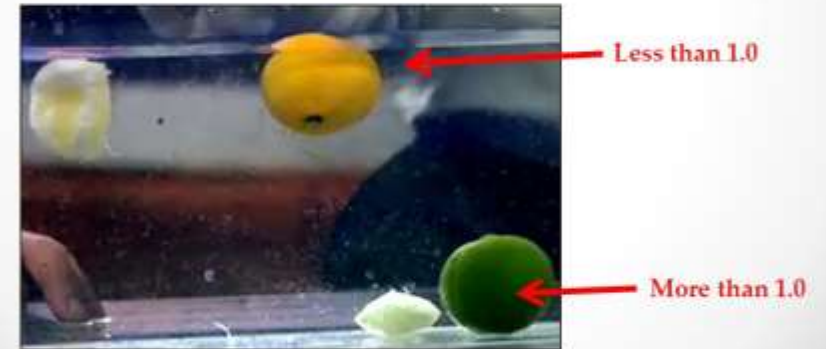
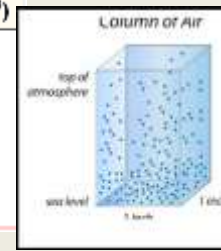


TABLE 1.6 Densities of Some Selected Substances at 25°C

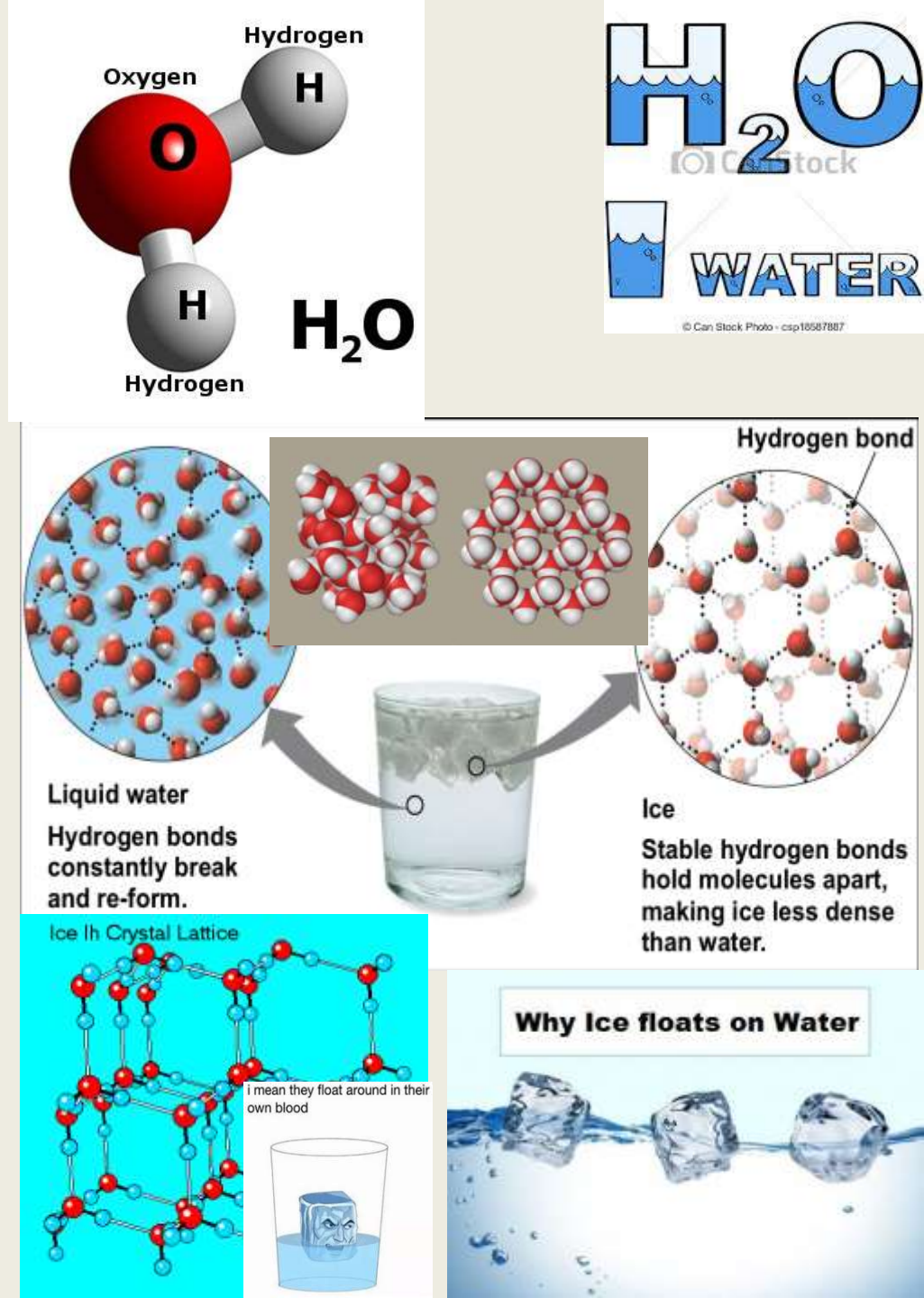
Substance	Density (g/cm ³)
Air	0.001
Balsa wood	0.16
Water	1.00
Table salt	2.16
Iron	7.9
Gold	19.32



Today's Qualitative Prompt

DRAW yourself tossing a SCHOOL BUS and an ICE CUBE into the Susquehanna River and then DESCRIBE which one you think will FLOAT!

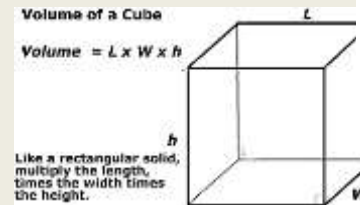
- ...while the ICE CUBE will also FLOAT since when Water FREEZES its “molecular” structure actually SPACES OUT to form a less compact CRYSTAL structure with a Density less than $1 \frac{g}{mL}$!



Bring-In's Lab Steps – Toy Space Rocks

1. First, get out your Science Notebooks and JOT-DOWN these few notes about how to measure DENSITY!
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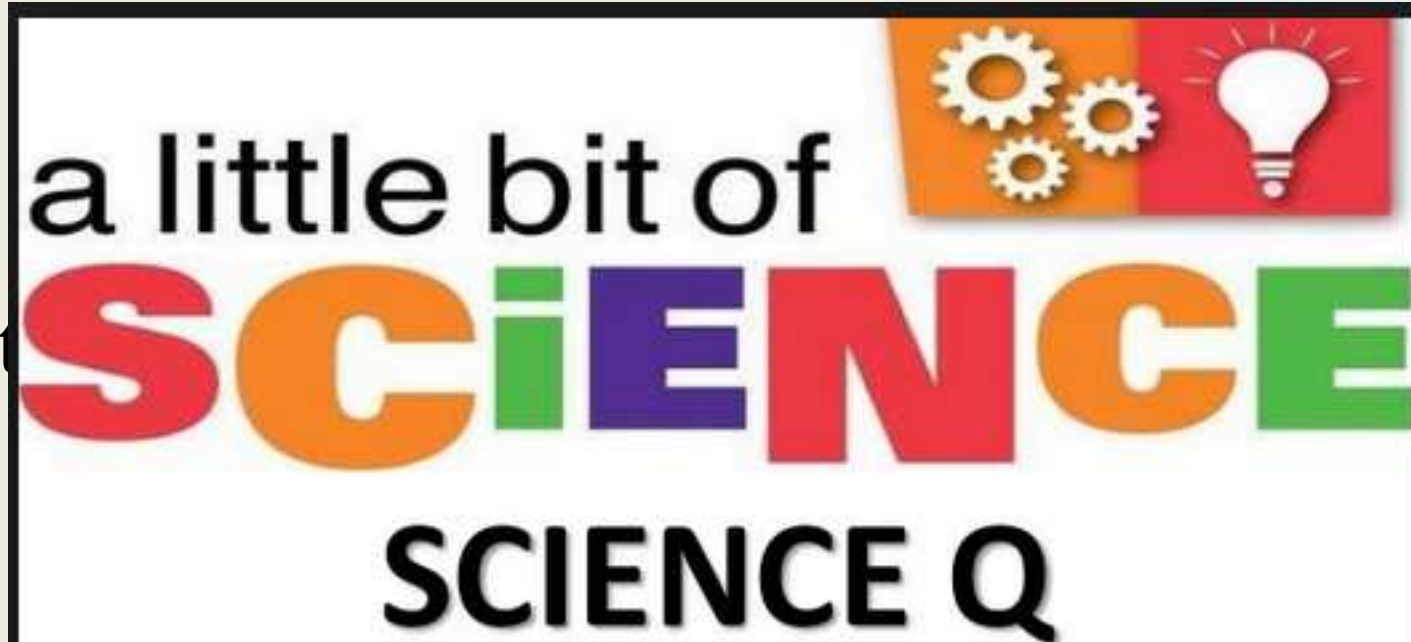
Material	Density (g/cm ³)
Copper	8.9
Brass	8.0
Steel	7.6
Aluminum	2.7
Acrylic	1.16 – 1.19
Oak (wood)	0.60 - 0.90
Nylon	1.13
Pine (wood)	0.35 – 0.60
Poplar (wood)	0.35 – 0.50
PVC	1.39 – 1.42



$$\text{density} = \frac{\text{mass}}{\text{volume}}$$

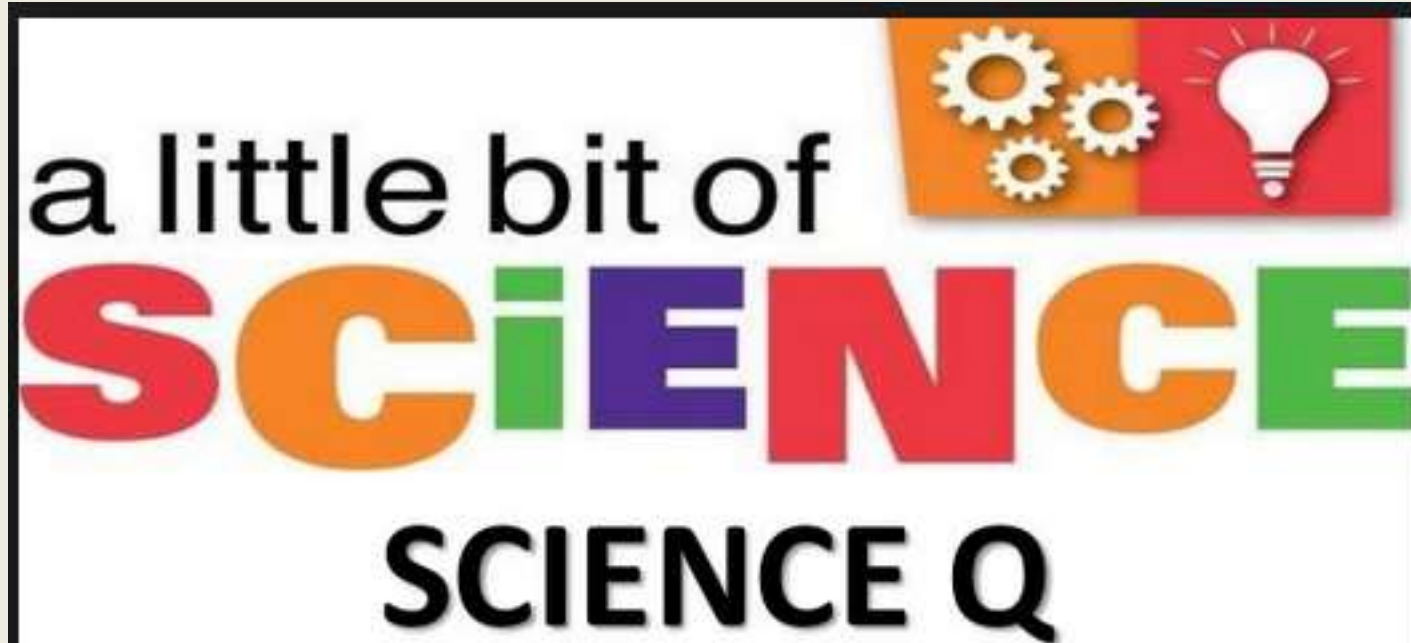
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Bell 2 Bell

- We work **BELL 2**
BELL in Mr. Floyd's class!
- I will thus quiz you about the science we learned today until the very end!
- Let us begin!



Tomorrow's Academic Objective and Plan

- Tomorrow you will LEARN how to use the Scientific Method to INQUIRE about the Universe!
- *HW = Finish Bring-Ins Lab!

$$\text{density} = \frac{\text{mass}}{\text{volume}}$$



FRIDAY, DECEMBER 7th

DO NOW

- In your notebooks, to be checked, solve this problem...

There are 12 inches in 1 foot.
These are units of length!

Know:

$$12in = 1ft$$

Asked: How many feet are in 132 inches?

TODAY'S PLAN

1. Do and review the **DO NOW** and **Qualitative Prompt (QP)**!
 - Today's **QP** = WRITE 3 questions that you could use SCIENCE to answer and then DESIGN and SKETCH an experiment to answer each one!
2. Open books, **WORK** on today's **AO!**
3. ***HW** = Finish Jot-Down Notes!

TODAY'S ACADEMIC OBJECTIVE

Today you will **LEARN** how to use the Scientific Method to **INQUIRE** about the Universe!

DO NOW – Units of Length

There are 12 inches in 1 foot. These are units of length!

- **Know/Given:**

$$12in = 1ft$$

- **Asked:** How many feet are in 132 inches?

What is KA² format? This is an example of a “1-pointer” on a DO NOW!

• **Know:**

$$12in = 1ft$$
$$\frac{12in}{1ft} \quad \frac{1ft}{12in}$$

• **Asked:** How many feet are in 132 inches?

• **Answer:** $132in * \frac{1ft}{12in} = 11ft$

DO NOW – Never Forget to Listen to Akila!

- To solve these problems, just multiply by the fraction with the units you want on top and “*Let the Units Guide You*”!

– Example: $84\cancel{\text{in}} * \frac{1\text{ft}}{12\cancel{\text{in}}} = 7\text{ft}$



DO NOW – Translating and Concluding Our Answer!

- **Answer:**

$$132\cancel{in} * \frac{1ft}{12\cancel{in}} = 11ft$$

- **Sci Fact** → *WOAH!* That's wayyy taller than Shaq!
- *Remember students, to perform these conversions always make sure to divide by the same unit so that they will cancel out! Isn't **SCIENTIFIC MATH** awesome!

ACROMEGALY AND GIGANTISM

ACROMEGALY: DISORDER OF IGF-1 WHICH CAUSES EXCESSIVE GROWTH OF THE HANDS, FEET, JAW, AND INTERNAL ORGANS IN ADULTHOOD

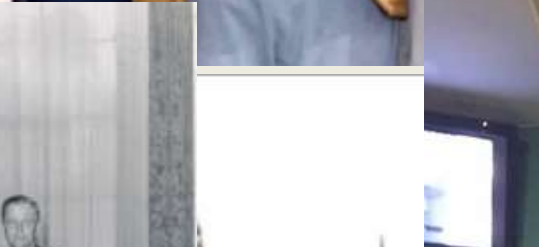
GIGANTISM: ABNORMALLY HIGH LINEAR GROWTH DUE TO THE EXCESSIVE ACTION OF IGF-1 BEFORE THE CLOSURE OF THE EPIPHYSEAL GROWTH PLATES IN CHILDHOOD

MRI SHOWS A PITUITARY TUMOR IN 90% OF ACROMEGALIC PATIENTS

THE BEST CONFIRMATORY TEST FOR ACROMEGALY IS THE ORAL GLUCOSE SUPPRESSION TEST

IN ACROMEGALY, GLUCOSE DOES NOT SUPPRESS GROWTH HORMONE

www.medcomic.com © 2013 Jorge Muntz



• **Sci Fact →**



ut! Isn

awesome!

FRIDAY, DECEMBER 7th

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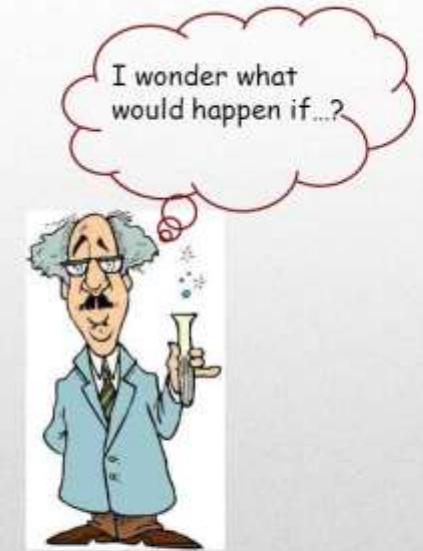
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Today you will **LEARN** how to use the Scientific Method to **INQUIRE** about the Universe!

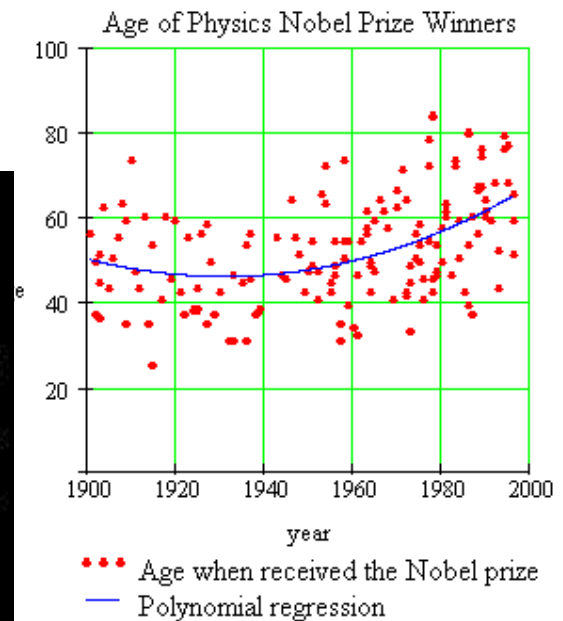
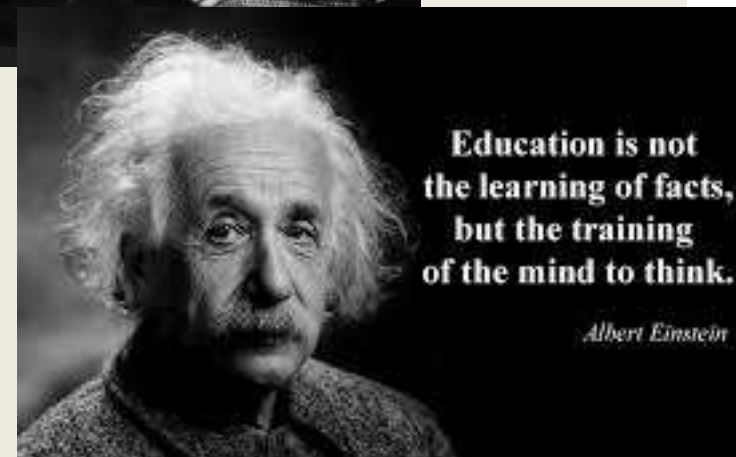
Today's Qualitative Prompt

WRITE 3 questions that you could use SCIENCE to answer and then DESIGN and SKETCH an experiment to answer each one!

- Students, the mark of any good scientist is NOT their ability to answer everything but their propensity to QUESTION everything!



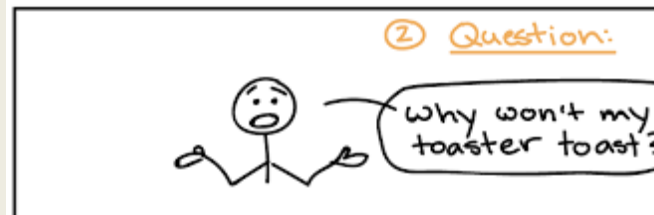
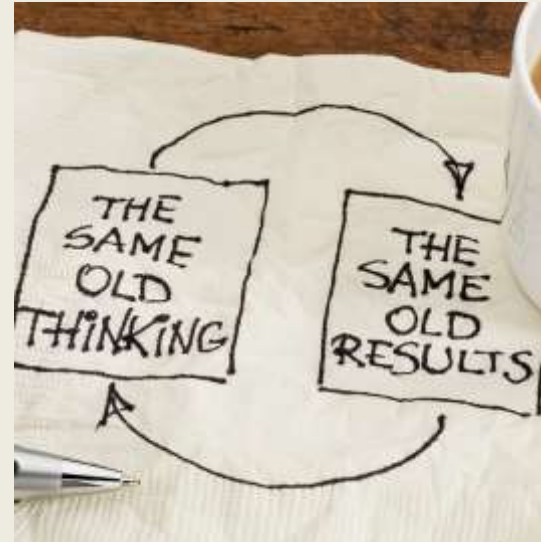
Scientists ask questions.



Today's Qualitative Prompt

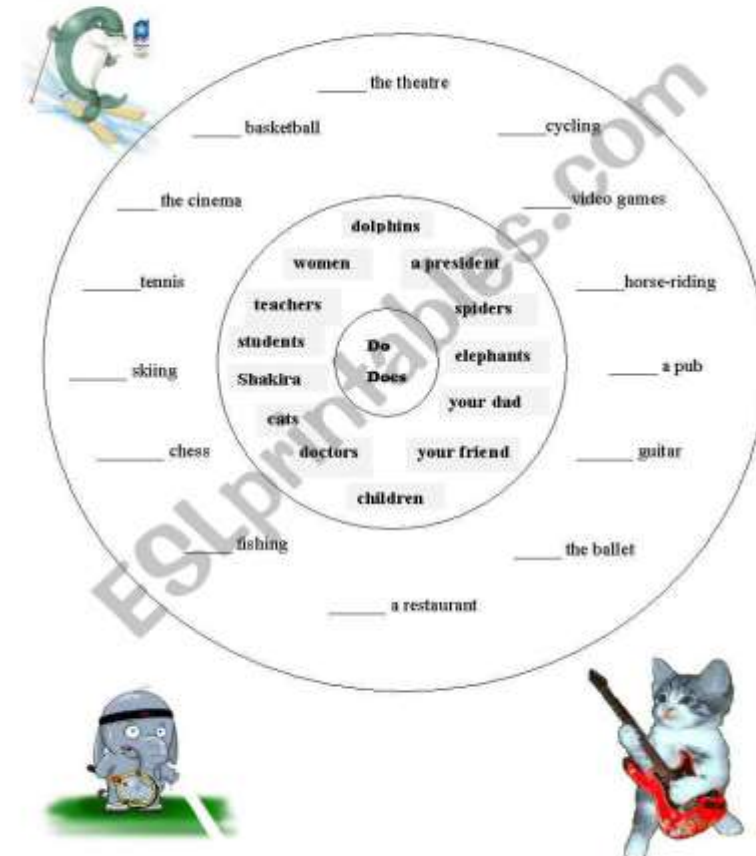
WRITE 3 questions that you could use SCIENCE to answer and then DESIGN and SKETCH an experiment to answer each one!

- Asking good scientific questions is a skill we rarely practice though, especially when we might not even know how to “use” Science!



Wheel of questions

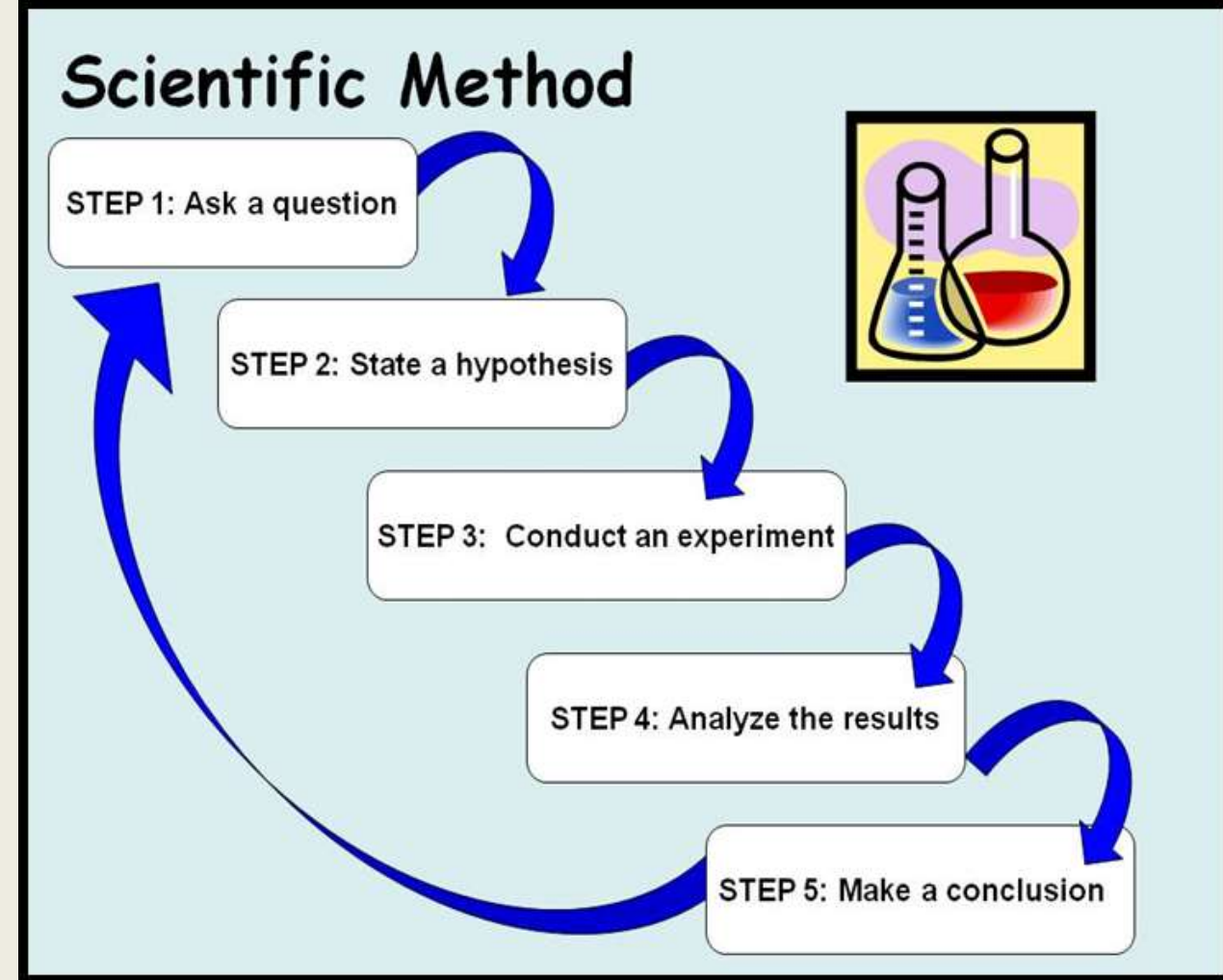
Fill the gaps with GO, PLAY, GO TO. Take turns to ask each other questions.



Today's Qualitative Prompt

WRITE 3 questions that you could use SCIENCE to answer and then DESIGN and SKETCH an experiment to answer each one!

- However, if I told you that “using Science” just meant using the STEPS of the Scientific Method I'm positive you'd be asking questions and DESIGNING experiments left and right!



- Hypothesis: An educated guess

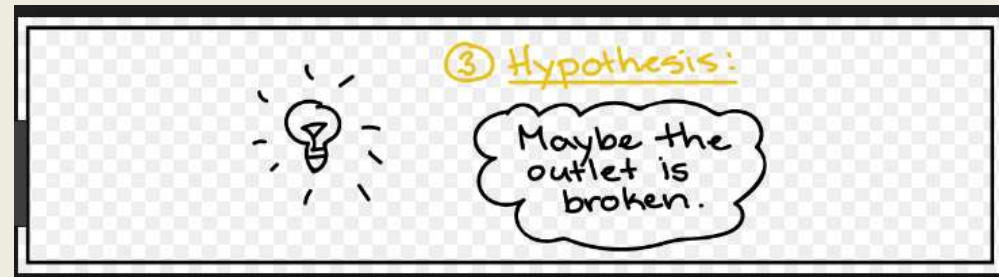
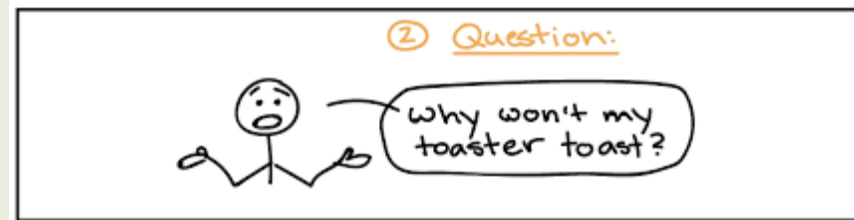
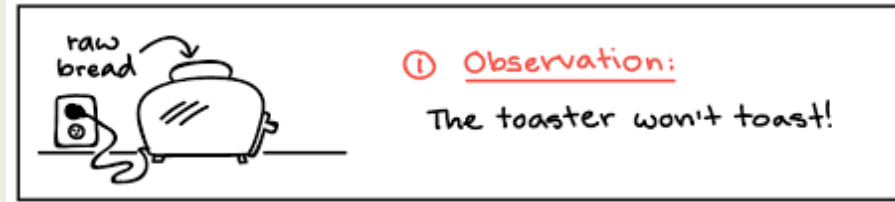
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Designing an experiment


- * Making an organized plan to test a hypothesis.
- * Usually follows a definite pattern.
 - * Pose a Question
 - * Develop a Hypothesis
 - * Plan the Procedure
 - * Control Variables
 - * Carry out the experimental procedure.
 - * Interpret the Data
 - * Draw Conclusions




Today's Qualitative Prompt

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- However, if I told you that “using Science” just meant using the STEPS of the Scientific Method I’m positive you’d be asking questions and DESIGNING experiments left and right!





④ Prediction:
If I plug the toaster into a different outlet, then it will toast the bread.



⑤ Test of prediction:
Plug the toaster into a different outlet & try again.

And the result is...

 <p>My bread toasts!</p> <p>Hypothesis is <u>supported</u>.</p>	 <p>My bread still won't toast.</p> <p>Hypothesis is <u>not</u> supported.</p>
--	---

⑥ Iteration time!

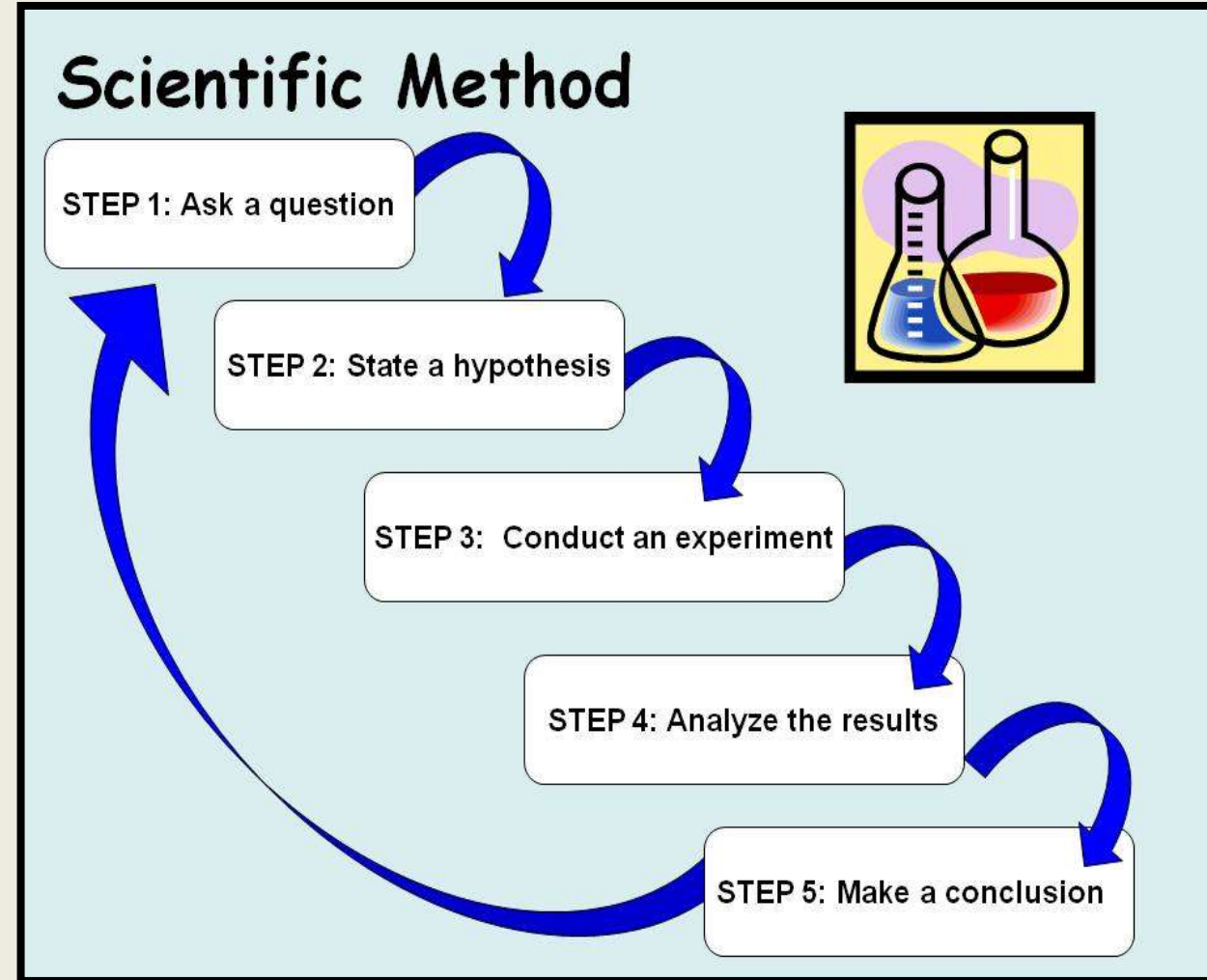
But what is actually wrong with that outlet?

Hmm... maybe there is a broken wire in the toaster.



Scientific Method – Jot This Down!

- The “Scientific Method” is simply a sequence of steps that scientists follow to perform **GOOD** science experiments!
 - GOOD Science = No opinions, false information, or assumptions!
- It is a way to ask and answer scientific questions by conducting **EXPERIMENTS** and collecting **DATA**!
 - Note! A “hypothesis” is just an educated guess or prediction that you make to answer the question!



• Hypothesis: An educated guess

What is a Control? – Jot This Down!

- Why could only ONE person blow the bubble in the previous example?
 - To do GOOD Science, you must CONTROL aka not change anything but the one VARIABLE you are testing!
- In this experiment we are testing which BRAND of bubble gum makes the biggest bubbles, so the person making the bubbles must remain CONSTANT (since people can vary in their bubble-blowing abilities)!

A variable is anything that could be changed that may affect the results or output of an investigation.



CONTROLLED VARIABLE

What I KEEP THE SAME

Types of Variables – Jot This Down!

- Variables are ANYTHING that can be changed in a Science EXPERIMENT!
- There are 3 main types!
 - Independent Variable = This is the thing you CHANGE to cause a result!
 - Dependent Variable = This is what CHANGES; it DEPENDS on what you do to the Independent Variable!
 - Controlled Variable = Every other variable that could be changed to affect the experiment must be held CONSTANT and is thus a CONTROL VARIABLE!

3 types of variables

INDEPENDENT VARIABLE



DEPENDENT VARIABLE

What I OBSERVE

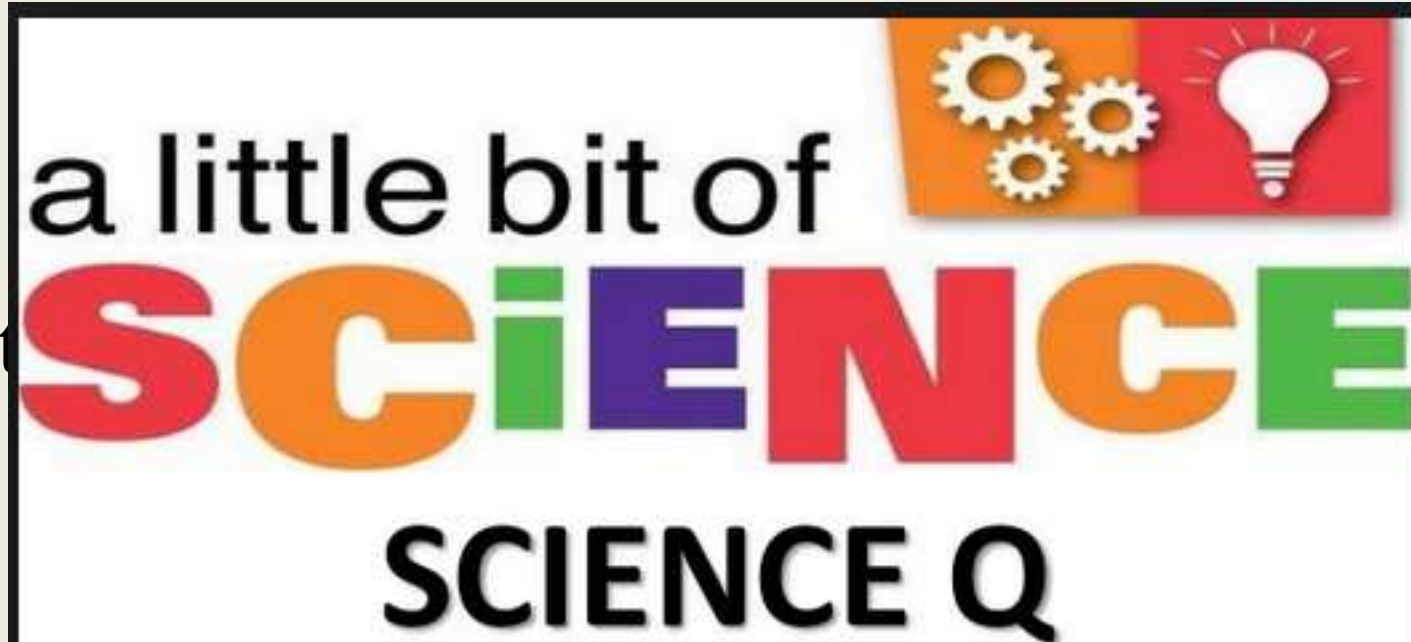


CONTROLLED VARIABLE

What I KEEP THE SAME

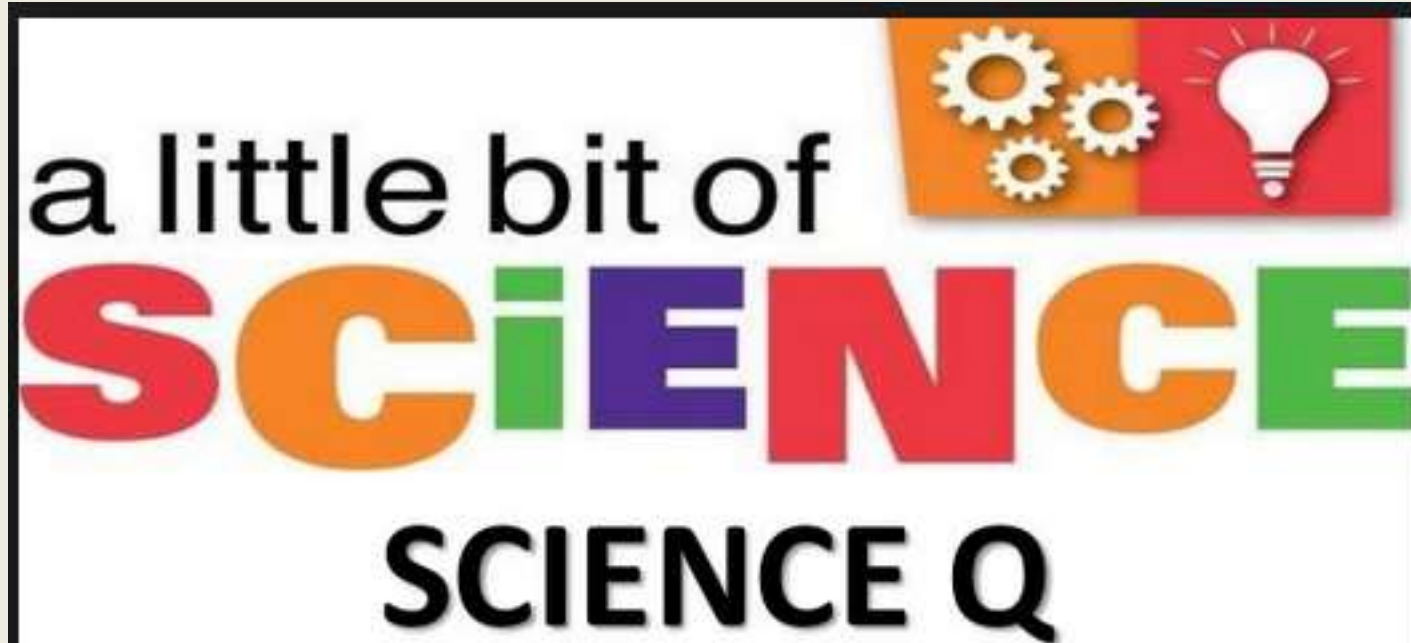
Bell 2 Bell

- We work what in this class?!?!?!
 - **BELL 2 BELL**
- Every single precious **SECOND** of academic instructional time is thus utilized in this classroom!
- You students will thus be vocally quizzed **EVERY DAY** until I **DISMISS** you at the end of class (with a positive greeting and a thank-you of course!).



Bell 2 Bell

- We work **BELL 2 BELL** in Mr. Floyd's class!
- I will thus quiz you about the science we learned today until the very end!
- Let us begin!



Tomorrow's Academic Objective and Plan

- Tomorrow you will **INQUIRE** about something that can be tested with Science and **DESIGN** a way to test it!
- *HW = Finish Jot-Down Notes!



Jot This Down!

