Announcements & Turn

1. Welcome to Physical Science!

HAPPY NEW SEMESTER

Game Plan:

1. Welcome
2. Review the Syllabus
3. Safety Review in the classroom.

Daily Targets:

Students Will Be Able To:
- Follow classroom procedures and lab safety in the science lab.

Assignments (due next class*):

Get information letter and safety contract signed.

ALWAYS GIVE 100% ...UNLESS YOU'RE DONATING BLOOD

Unit 1
PHYSICAL SCIENCE

Mrs. Holley- Clayton High School

What is Physical Science?

- Required for graduation
- Need 3 sciences (Earth, Biology and Physical Science)
- ~ ½ Chemistry and ½ Physics
- 11 Units total
- 11 Tests total
- Credit Recovery is available on ALL TESTS!

Grade Breakdown:

— 15% content literacy/HW (warm-ups)

— 35% CW, Labs, Quizzes

— 50% Tests

Tutorials are Tuesday A and Thursday B

* After each test you may attend a tutorial for credit recovery. It is a half sheet of paper with 15-20 key concept questions. You may use your notes, google or textbook to look up the answers.

Credit Recovery

- You will earn back a percentage of your points.

- If you make a 60% or higher, you may earn back up to ½ of the points lost

- If you score a 59% or below you may earn back points up to a 69%.

- Let's look at some examples….

Credit Recovery Example

- Lets say a student earns a 66% the first time they take the test. They come and do credit recovery and get 15/20 questions correct (75%). That means that the student has earned 75% of the max points.

- What were the max points? 100-66 = 34. One half of 34 is 17. If the student had gotten 20/20 they would have earned 17 points back, however they did not and earned 75% of 17 which is 12.75 or 13 points.

- There new average for the test is now 13+66= 79.

- I DO THE MATH, YOU EARN THE CREDIT!

Credit Recovery Example

- Lets say a student earns a 40% the first time they take the test. They come and do credit recovery and get 12/20 questions correct (60%). That means that the student has earned 60% of the max points.

- What were the max points? 100-40 = 60. One half of 60 is 30. If the student had gotten 20/20 they would have earned 30 points back, however they did not and earned 60% of 30 which is 18 points.

- There new average for the test is now 18 + 40 = 58%

- I DO THE MATH, YOU EARN THE CREDIT!

Credit Recovery Example

- Lets say a student earns a 56% the first time they take the test. They come and do credit recovery and get 18/20 questions correct (90%). That mean that the student has earned 90% of the max points.

- What were the max points? 100-56 = 44. One half of 44 is 22. If the student had gotten 20/20 they would have earned 22 points back, however they did not and earned 90% of 22 which is 19.8 or 20 points.

- There new average for the test is now 56 + 20 = 69. (?)

- REMEMBER, YOU MUST EARN A 60% THE FIRST TIME TO BE ELIGIBLE TO EARN BACK A GRADE GREATER THAN A 69.

- Why? Because I want you to study and try hard the first time, not rely on second chances or credit recovery. Will credit recovery save your butt if science isn't you thing? YES. Will credit recovery give you a chance to earn "extra credit". YES.

You try.

- #1- Student scores an 86. Earns a 80% on credit recovery. What is the new score?
- #2 Student scores a 30. Earns 75% on credit recovery. What is the new score?
- #3 Student scores a 70. Earns a 100% on credit recovery. What is the new score?
- #4 Student scores a 48. Earns a 50% on credit recovery. What is the new score?
- What's the moral of the story?

Class Expectations

- 1) Be On Time, Be Prepared, Be Respectful.
- 2) Turn in all work to the BASKET by the door.
- 3) Make up all missed work during COMET time or in evening academy.
- 4) Only one person out to the restroom at a time.
- 5)Put your phones up. I'll let you know when you can have them out.

Other Stuff…

- All notes are on my website- as are ALL class assignments. If you are out or lose a copy of something print it out on your own.

- Folders beside the basket has returned work.

- My Syllabus and safety contract are on my website.

- You and your parent/guardian will sign off that you have looked at the syllabus and safety contract.

Lab Safety

- On the back of your HOMEWORK RECORD paper, draw a <u>birds-eye view</u> (view looking down) of the room.

- Label all safety equipment

Lab Safety

Did you draw or label?

- Fire extinguisher
- Lab stations, lab benches
- 7 sinks
- Emergency eye wash   15 minutes
- Safety shower
- Fume Hood   vents to outside
- Fire blanket   stop, drop, and roll
- First aid kit
- Goggles cabinet   used when heating, mixing
- MSD safety sheets   physical and chemical properties of chemicals
- 3 points of egress (exit)

- COMMON SENSE   Be aware! (Rule #1)

Time for Content!

- Today we will start a lab activity.

- It will allow us to discuss lab safety and to investigate the scientific method.

- You will do this in groups, one sheet per group with everyone's name on it.

Is there Water on Zork?

- Some students are visiting the planet Zork. They are running low on water. Through remote sensing techniques, they know that water exists on Zork, but they're not sure where it is. Fortunately, they encounter some friendly Zorkians who speak English; unfortunately, their words for water, clear and liquid are different from ours. The visiting students need to explain to the Zorkians that they are looking for water.

Answer these questions:

1. If you were a Zorkian what questions could you ask about this commodity (For example: What does water feel like? What is it used for? Why do you need it?)

2. If you were a visiting student and you didn't speak Zorkian, how would you describe the characteristics of water? (Hint: use all 5 senses)

Announcements & Turn

1. 2 sheets signed

HAPPY **NEW** SEMESTER

Game Plan:

1. Questions
2. Metric notes and Scientific Notation Notes
3. Metric Problems
4. Zork

Daily Targets:

Students Will Be Able To:
- Follow classroom procedures and lab safety in the science lab.
- use metrics and metric conversions in the science lab.

Assignments (due next class*):

You need your powerschool log in tomorrow.

ALWAYS GIVE **100%** ...UNLESS YOU'RE DONATING BLOOD

Physical Science
Chapters 1-3

SI system

- Used by all scientists
- SI base units of measurement
  - Length → Meters
  - Volume → Liters
  - Mass → Grams

KHDa__(base unit)__DCM

- King Henry Died BY Drinking Chocolate Milk
- K = Kilo
- H= Hecto
- Da= Deca
- D= Deci
- C= Centi
- M= Milli

"I got you ten roses. I believe strong relationships are based on the metric system."

Intro to Metric

- Nye Metric

- At your table locate the graduated cylinder, meter stick and look at the front of the room to see a triple beam balance.

At your table…

- **Find the length of 5 objects that your group sel*ects.***
- **Draw the chart below, list your items and their measurements. One sheet per lab table, put everyone's name on the sheet.**

Unit of Measurement	Items selected in your group	Measurements (List the unit)
Mass (g) (Balance)	(1)	
Volume (L) (Graduated cylinder)	(1)	
Length (m) (Meterstick)	(1)	
	(2)	
	(3)	
	(4)	
	(5)	

At your table...

- **Find the mass of 1 object that your group selects.**

- **Find the volume of 3 objects your group selects.**

- **Find the length of 5 objects that your group selects.**

- **Draw the chart below, list your items and their measurements. One sheet per lab table, put everyone's name on the sheet.**

Unit of Measurement	Items selected in your group	Measurements (List the unit)
Mass (g) (Balance)	(1)	
Volume (L) (Graduated cylinder)	(1)	
	(2)	
	(3)	
Length (m) (Meterstick)	(1)	
	(2)	
	(3)	
	(4)	
	(5)	

Metric Conversion Practice Sheet

- Work independently or in small groups to complete the metric conversions. We will go over these as a class.

Density

- Density- the ratio of a material's mass to its volume

- Denisty = $\dfrac{\text{Mass (grams)}}{\text{Volume (cm\textasciicircum 3 OR mL)}}$

Announcements & Turn In:

Check your answers from yesterday's activity with your lab partner.

Game Plan:

1. Warm-up on Metrics and Scientific Notation
2. Chromebook work – email Mrs. Holley, find website, Density Activity
3. Zork Lab

Daily Targets:

Students Will Be Able To:
- Review density measurement and the metric system.
- Access Physical Science resources on Mrs. Holley's website.

Assignments (due next class*):

1. Notebook – organized and up to date.

ALWAYS GIVE
100%
...UNLESS YOU'RE
DONATING BLOOD

* unless otherwise noted.

K h da base d c m Practice

1. Convert 3.876 Kg to dg
   - Moves to the right = 38760 dg
2. Convert 526 dL to hL
   - Moves to the left = 0.526 hL
3. Convert 2.8 s to ms
   - Moves to the right =2800 ms
4. Convert 45 g to Kg
   - Moves to the left = 0.045 Kg

Scientific Notation

- When writing very large or very small numbers, scientists use a kind of shorthand called scientific notation.

- This is a way of writing a number without so many zeros.

All you do is move the decimal so that you **only have one** number before the decimal.

- 850,000,000.0

8 5 0 0 0 0 0 0 0 . 0

$$= 8.5 \times 10^8$$

For large numbers the exponent is positive!!

All you do is move the decimal so that you **only have one** number before the decimal.

- 0.000,000,025

0 . 0 0 0 0 0 0 0 2 5

$= 2.5 \times 10^{-8}$

For small numbers the exponent is
negative!!

Scientific Notation Examples

- 0.007899 = ?
  - Small number = - exponent 7.899×10^{-3}
- 898745.30 = ?
  - Large number = + exponent 8.9874530×10^{5}
- 0.00003657 = ?
  - Small number = - exponent 3.657×10^{-5}
- 531120 = ?
  - Large number = + exponent 5.31120×10^{5}

Getting numbers **out of** Scientific Notation

- Look at the exponent of the number to determine if it needs to get smaller or larger.
  - Positive exponent means the number gets larger so the decimal moves to the right.
  - Negative exponent means the number gets smaller so the decimal moves to the left.
- Add zeros to fill in any "BLANK" spaces.

- Example 1: 2.35×10^5
  - The exponent is positive so the number needs to get larger
  - 2 3 5   .

  - 2 3 5 0 0 0.   or 235000
- Example 2: 8.68×10^{-4}
  - The exponent is negative so the number needs to get smaller
  - .   8 6 8

  - 0. 0 0 0 8 6 8   or 0.000868

Scientific Notation Examples

- 3.256×10^4
  - positive exponent = large number   3256

- 9.78×10^9
  - positive exponent = large number 978000000000

- 5.24×10^{-3}
  - Negative exponent = small number   0.00524

- 2.41×10^{-7}
  - Negative exponent = small number   0.000000241

Chromebook

- 5 technology tasks!

- Complete the 5 tasks on the chromebook that has been assigned to you for physical science. You will turn in the handout in the basket before you leave. Watch the board – we will do some things together as a class.

Let's try to find the density of unknown minerals

- [Density Lab- Displacement (Volume) and Mass - Computer Simulation](#)

Scientific Notation Review

- Complete the worksheet with your lab partners. Write all answers in your notes.

- We will go over the sheet.

Algebra Review

- Before we move on to solving single variable equations we will do an algebra review. You should work on this independently or in small groups. I will demonstrate a few problems.

- We will go over the sheet.

Practice Problems

- A piece of metal has a mass of 46.7 grams and a volume of 3.7 mL. What is its density?

- First, write down what you know!!

- Mass = 46.7 g

- Volume = 3.7 mL

- Plug in the numbers!

- Density = $\dfrac{46.7\ g}{3.7\ mL}$

Answer? = 12.62 g/mL

(DON'T FORGET THE UNITS)

Practice Problems

- Solid gold has a density of 19.3 g/cm^3. If the mass of a piece of gold is found to be 32 grams what is the volume of the piece of gold?

- Density = 19.3 g/cm^3

- Mass = 32 g

- Volume = ?

- 19.3 g/cm^3 = <u>32 g</u>
                   Volume cm^3

    How do you solve?

Practice Problems

19.3 g/cm^3 *Volume = 32 g

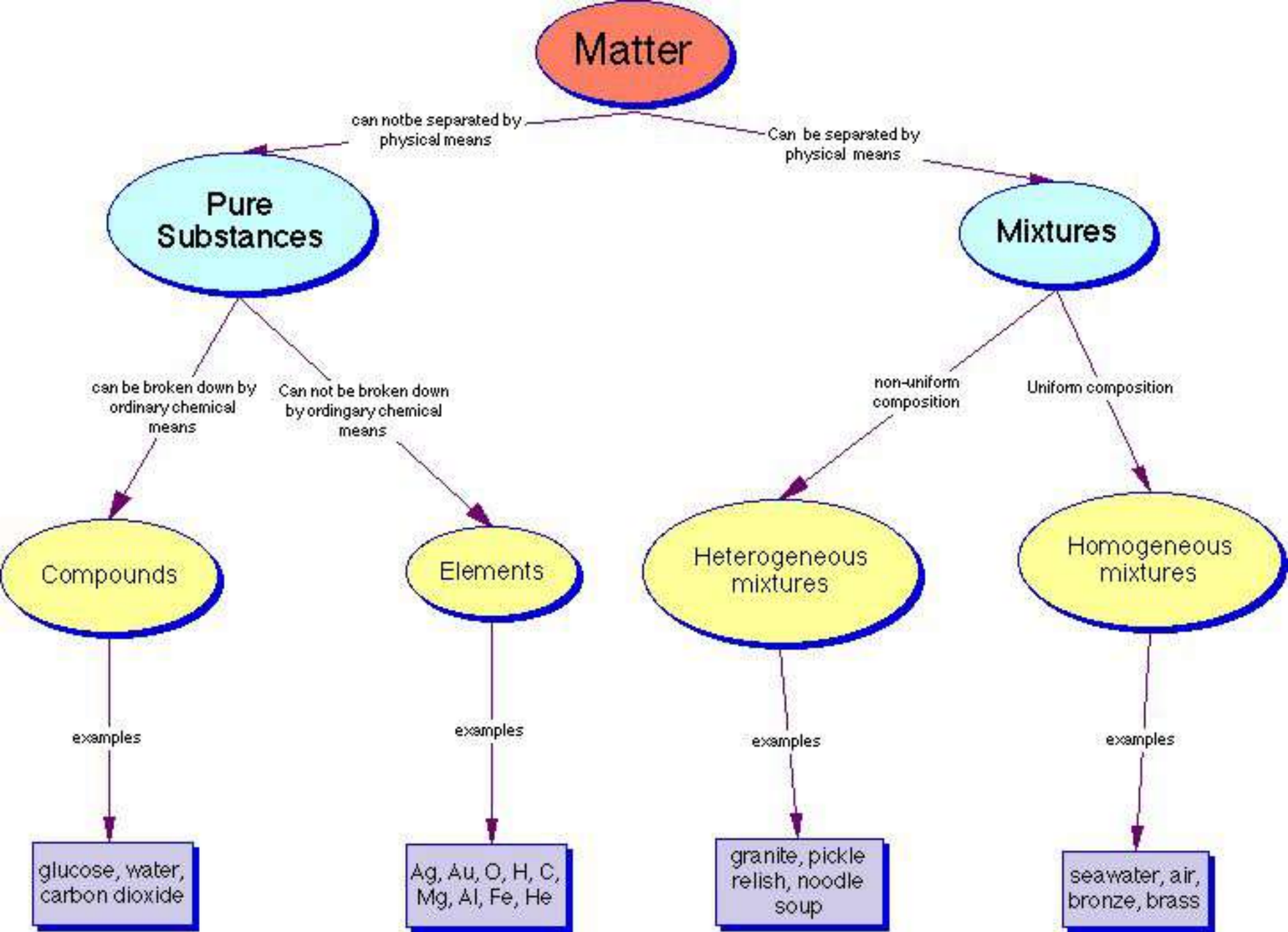*I multiplied both side by volume.
*Now divide 32 g by 19.3 g/cm^3

Answer?
 1.66 cm^3

Volume and Displacement

- Example: I have a graduated cylinder with 24.2mL of water. I drop my ring in the water and the level rises to 24.8mL. What is the volume of my ring?

- Solve:

- 24.8 mL– 24.2 mL= 0.6 mL

- *Be sure to read and complete ALL parts of a problem. Most problems have more than one calculation that needs to be done to get a final answer.

Practice with Multiple types of Density Problems

- Always show your work (or no credit)
- Always label your units (or you lose credit)
- Always try first
- Always ask for help if you need it after you try.

Matter

can not be separated by physical means → **Pure Substances**

Can be separated by physical means → **Mixtures**

Pure Substances:
- can be broken down by ordinary chemical means → **Compounds**
- Can not be broken down by ordingary chemical means → **Elements**

Mixtures:
- non-uniform composition → **Heterogeneous mixtures**
- Uniform composition → **Homogeneous mixtures**

Compounds — examples → glucose, water, carbon dioxide

Elements — examples → Ag, Au, O, H, C, Mg, Al, Fe, He

Heterogeneous mixtures — examples → granite, pickle relish, noodle soup

Homogeneous mixtures — examples → seawater, air, bronze, brass

Pure Substance

- Pure Substance: fixed uniform composition (every part is the same)

  - Element : cannot be broken down into simpler substances

  - Compound : made of two or more simpler substances

    - fixed proportions

    - molecules

Mixture

- Mixture: not uniform composition
  - Heterogeneous : parts are noticeably different from each other (chocolate chip ice cream, rocks, sand)
  - Homogeneous : parts are mixed so well, it looks uniform (tap water, metal alloy, Gatorade)

Additional Mixtures

– Solution (homogeneous)

  » Completely dissolved, and will not separate over time

  » Very small particles

  » Transparent

Additional Mixtures

- <u>Suspension</u> (heterogeneous)
    - –Will separate into layers over time
    - –Large particles
    - –Cloudy (Italian dressing, dust in the air)

Additional Mixtures

- Colloid
  - Will not separate (like solution)
  - Acts like a solid and a liquid at the same time
  - Not completely dissolved (like suspension)
  - (milk, shaving cream, paint, mayo, jelly, cheese, Styrofoam)

Practice Identifying Types of Mixtures

- Apply what you have learned to correctly identify a substance as homogeneous or heterogeneous.

Physical and Chemical Properties

Physical Property: any characteristic of a material that can be measured or observed without changing the composition of the material

- Viscosity: ability to resist flow

- Conductivity: ability to transfer heat or electricity

- Malleability: ability to be hammered without shattering

- Hardness: ability to resist scratching

Physical and Chemical Properties

- –Ductility: ability to be drawn into a thin wire
- –Density: ratio of mass to volume
- –Melting Point: temp. at which a substance melts
- –Boiling Point: temp. at which a substance boils

Physical and Chemical Properties

- Chemical Property – the ability to produce a change in the composition

- Ex. Flammability, reactivity

- Physical Change: reversible, chemical composition **DOES NOT** change

- Chemical Change: not easily reversible, chemical composition **DOES** change

Physical and Chemical Properties

- How to identify a chemical change:
  - 1) create something new
  - 2) form a gas
  - 3) form a precipitate
  - 4) something burns
  - 5) create heat or light
  - 6) endothermic / exothermic
  - 7) dramatic color change

Identify if ….

- A chemical or physical change has occurred.
- The property is chemical or physical.

Phases of Matter

- ## Solid
  - Definite size (volume and shape)
  - Particles are arranged in a **crystalline** structure
  - Particles have a low amount of energy

Phases of Matter

- Liquid
  - Definite size (volume) but not a definite shape
  - Takes on the shape of the container
  - Particles have a higher amount of energy than solids (not as tight)

Phases of Matter

- Gas
  - No definite size (volume) or shape, gasses will fill the entire space (size and shape) takes on size and shape of container.
  - Particles have higher amount of energy and are loosely arranged, moving quickly and bouncing all around
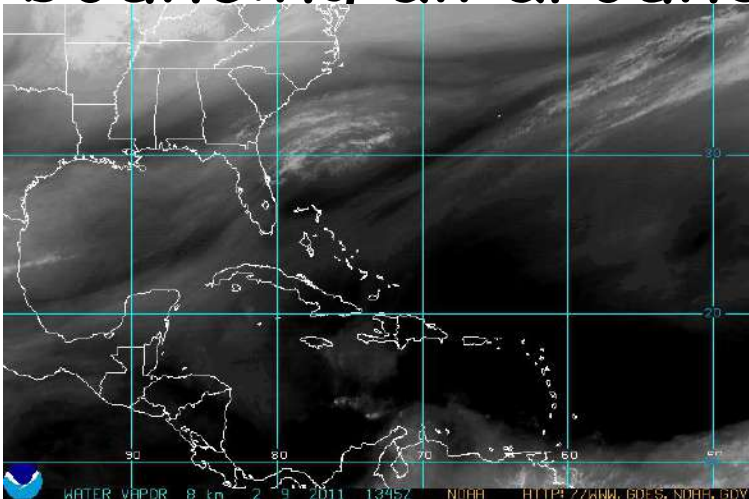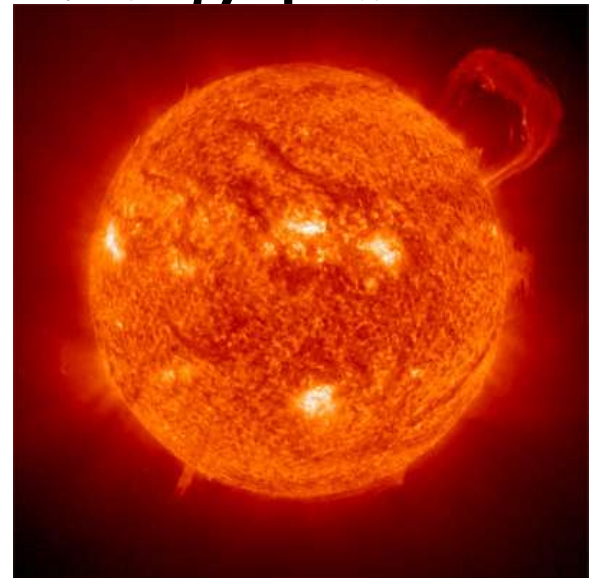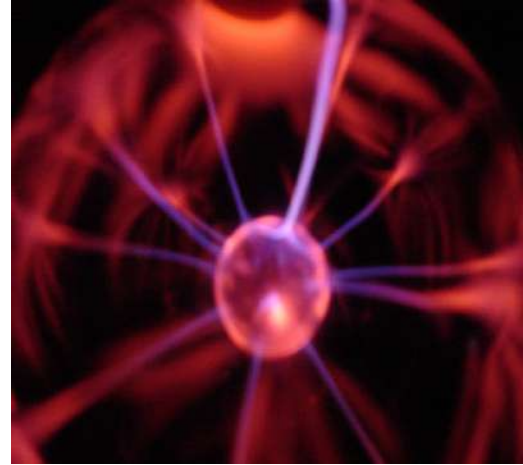
Phases of Matter

- Plasma
  - What 99% of the universe is composed of
  - Very, very, very high energy particles

Phase Changes

- Solid → (Melting)→ Liquid
- Liquid→ (Boiling) → Gas
- Gas → (Condensation) → Liquid
- Liquid → (Freezing) → Solid
- Solid → (Sublimation) → Gas
- Gas → (Decomposition) → Solid

Graph Indicating Temperature of a Substance When Heated

Temperature

Solid=>Liquid

Gas

Solid

Liquid=>Gas

Liquid

Time