Matter, Energy, Environment

(Bundled Homework)

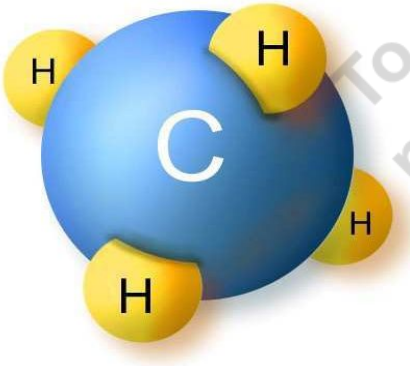
Name:

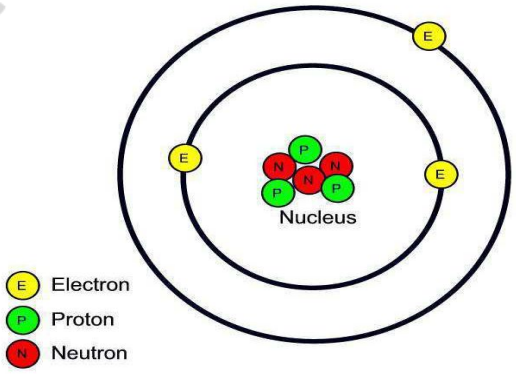
Due:

Sketch of Matter	Why is your sketch made of matter? How do you know?

Please try and destroy the picture above. Can you do it?

Which of the following drawings are of an element, and which is of a compound? Describe your reasoning in the spaces around each picture.



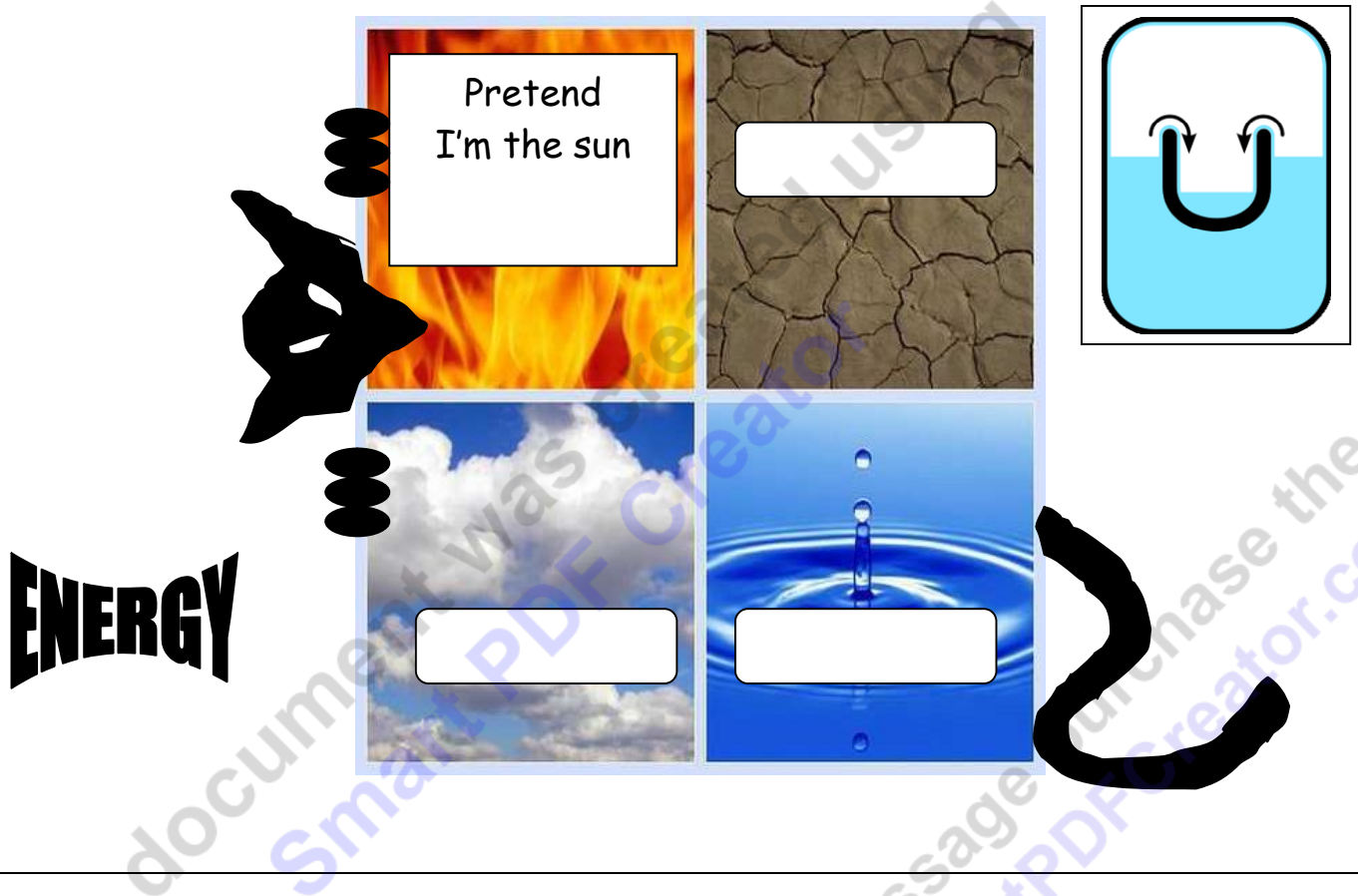


Please use these shapes below to **represent the mixtures.** ◊ □ ○ ×

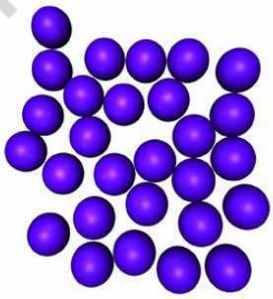
Homogeneous	Heterogeneous
	

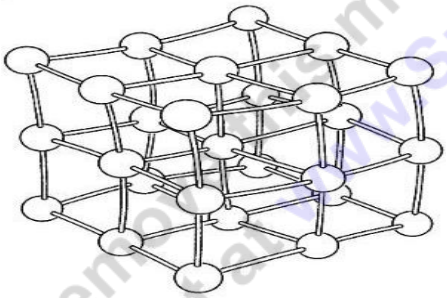
Make up a brand of soda for scientists. Please describe your solution using some science terminology.

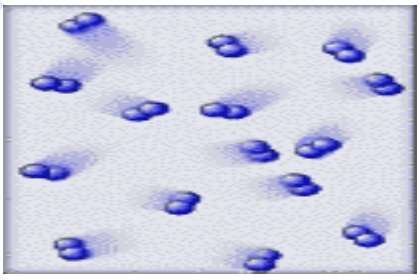
Please describe the states of matter below. Provide some properties of each state of matter.



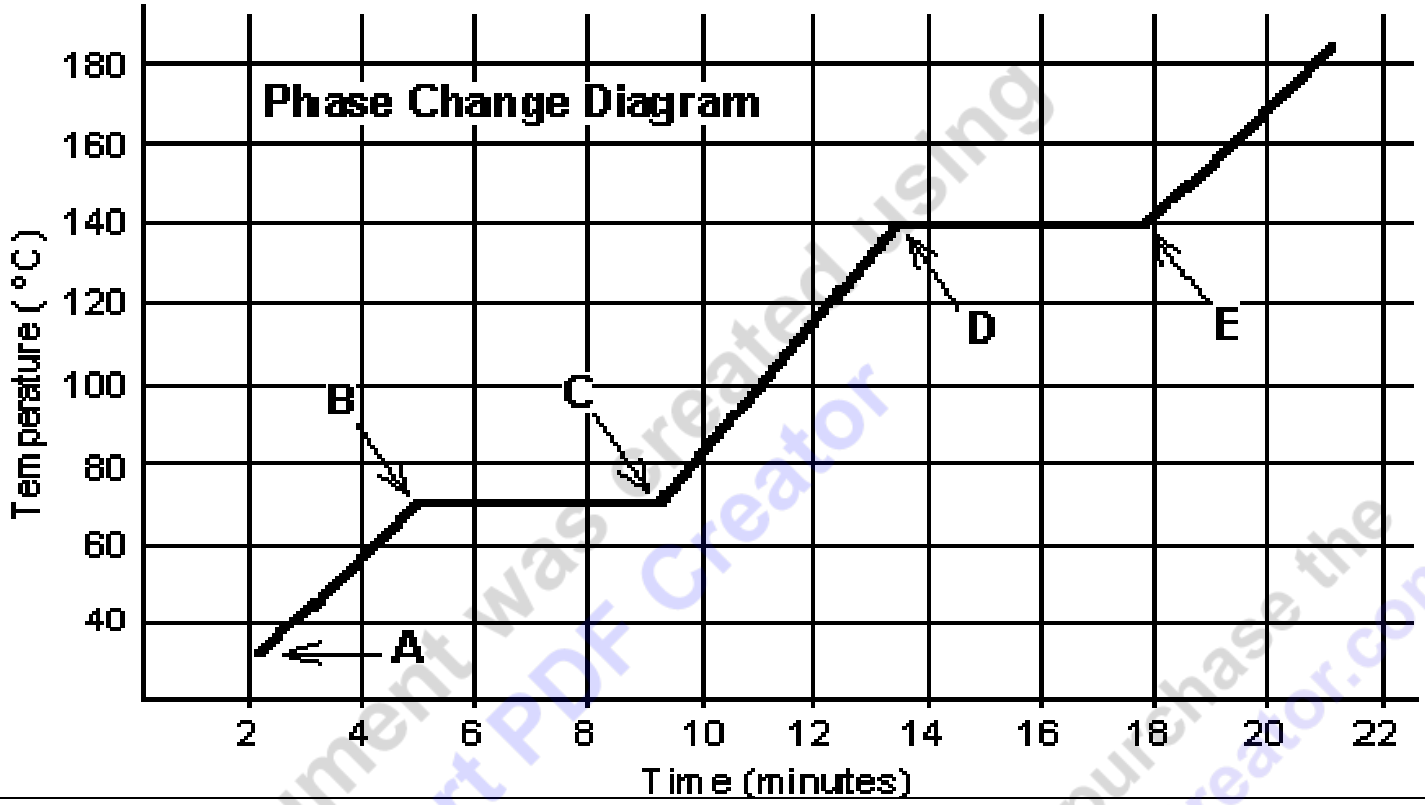
Name each state of matter on a molecular level. (Solid, Liquid, Gas)



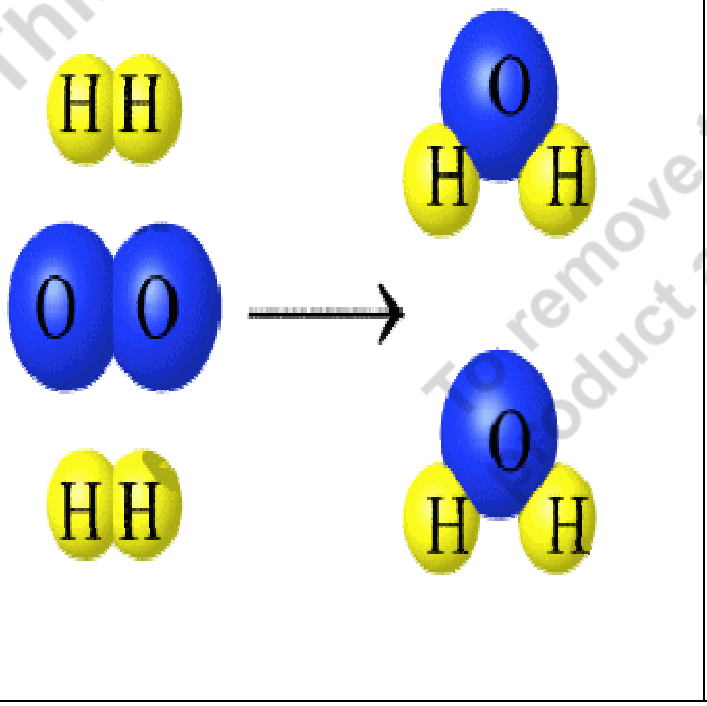




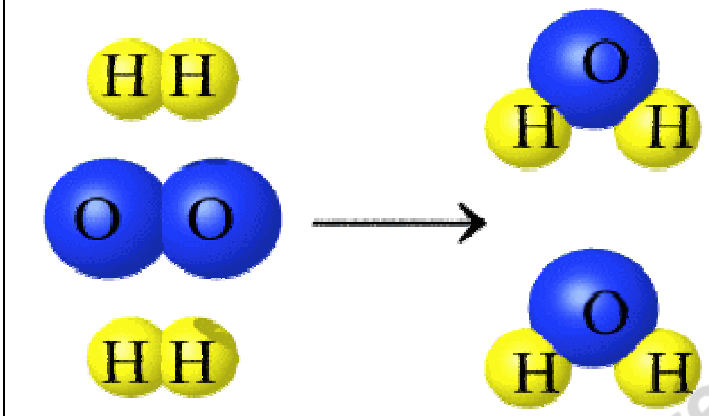
On the graph below, please place the following terms. Latent heat, Gas, Solid, Liquid, latent heat

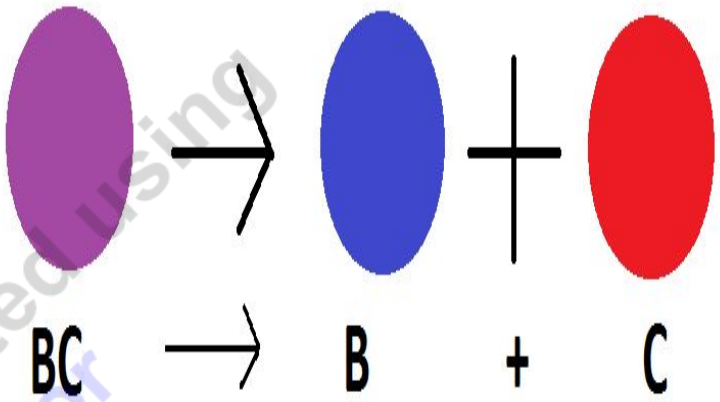


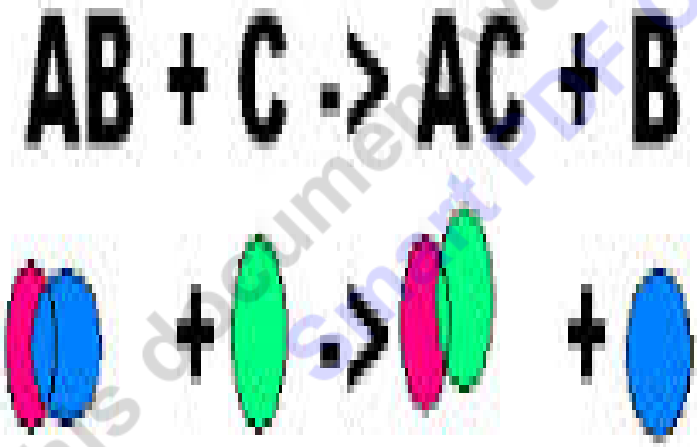
Which of the following pictures is a chemical change, and which is a physical change? Explain in the boxes next to the picture.

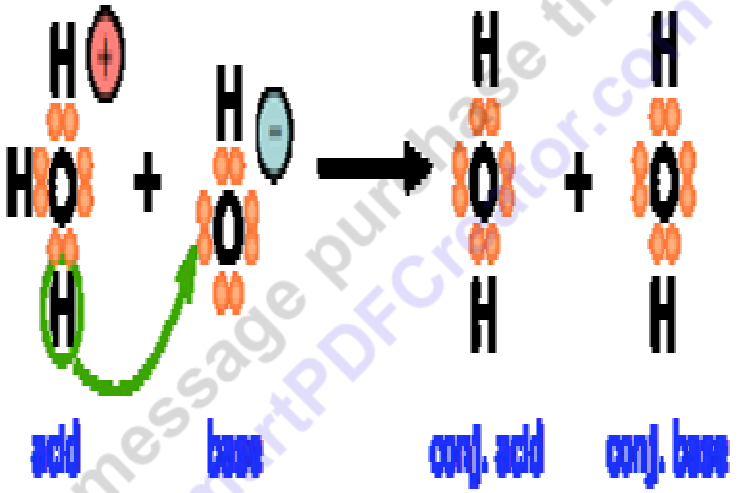


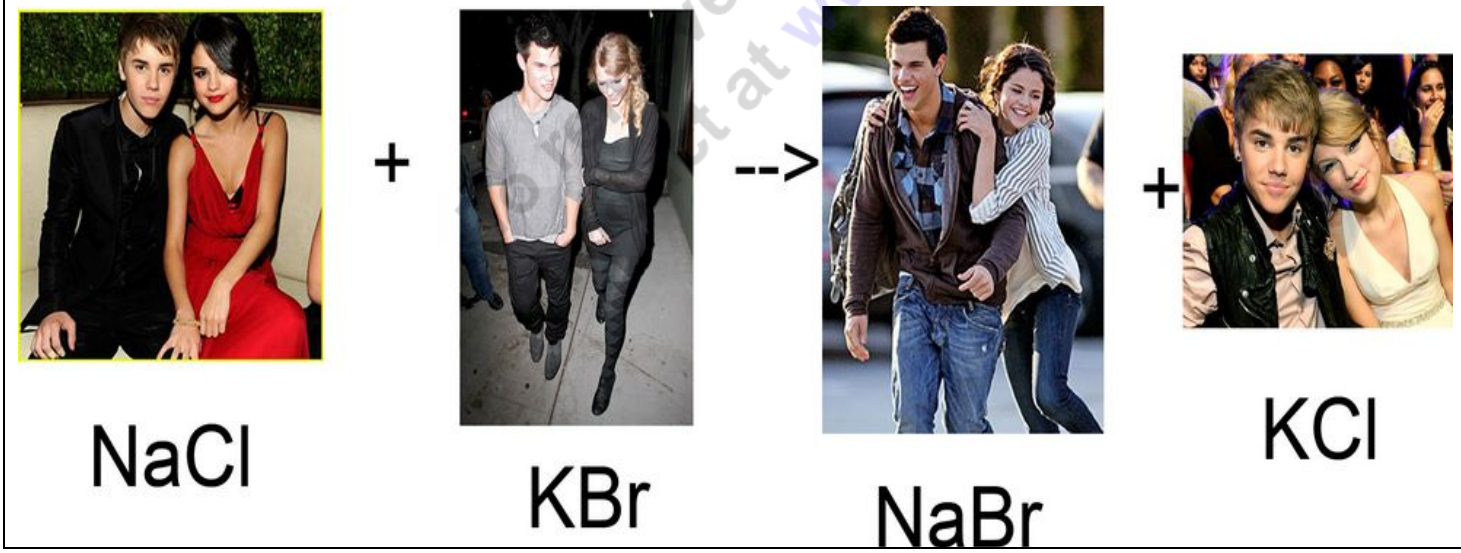
Name the six types of chemical reactions below?

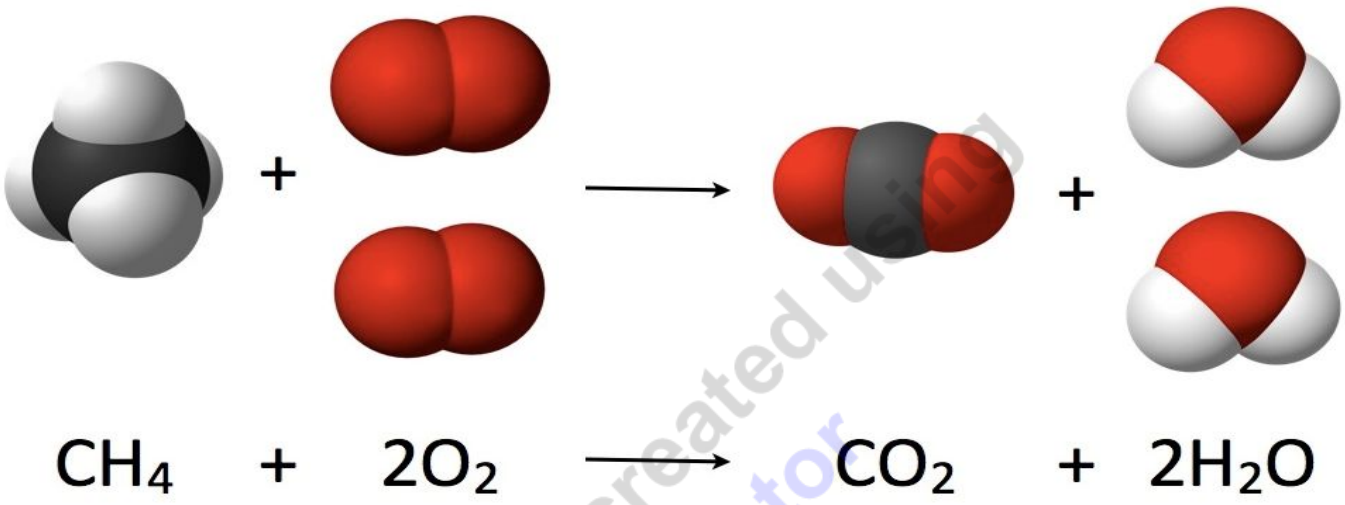






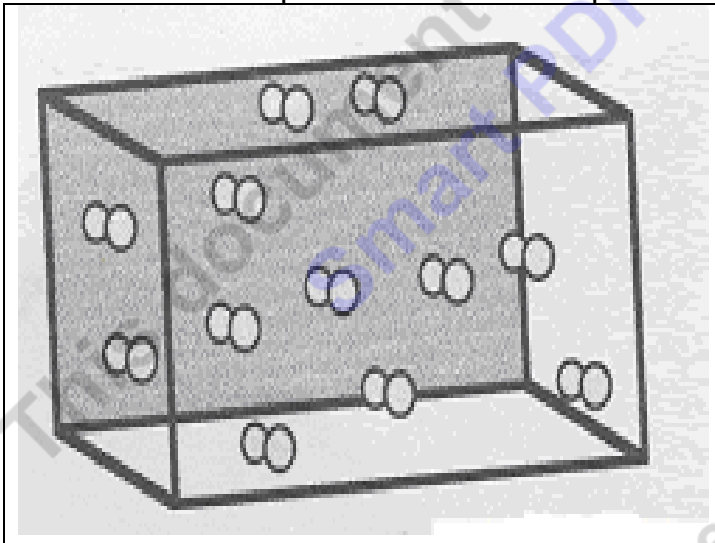




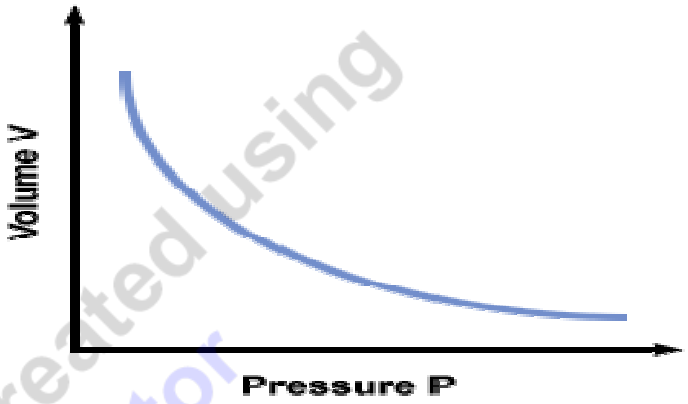


$CH_4 + 2O_2 \longrightarrow CO_2 + 2H_2O$

Which pictures best represent Charles Law and Avogadro's Law? Explain your reasoning next to each. A really strong answer, worth some bonus points will incorporate V over T = K

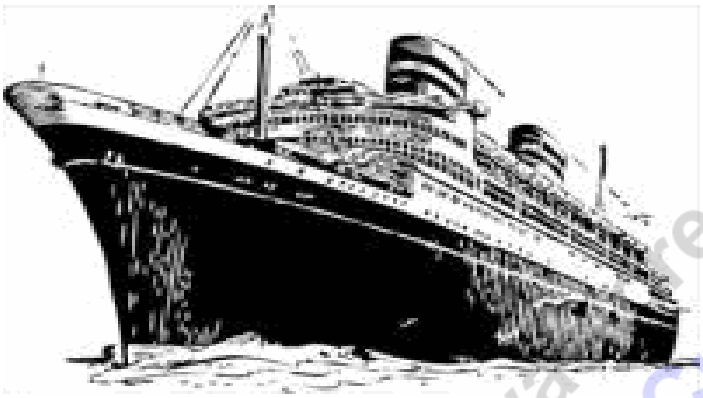


Describe the following graph where the X-axis is pressure, and the Y-axis is volume. Whose Law are we talking about and how does volume and pressure relate to a gas?

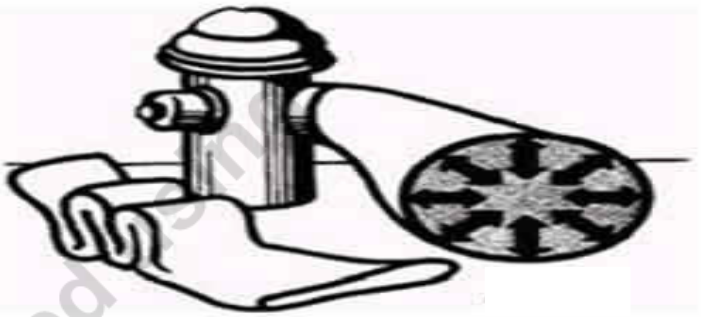


Please use the picture below to describe which fluids have a high and low viscosity?

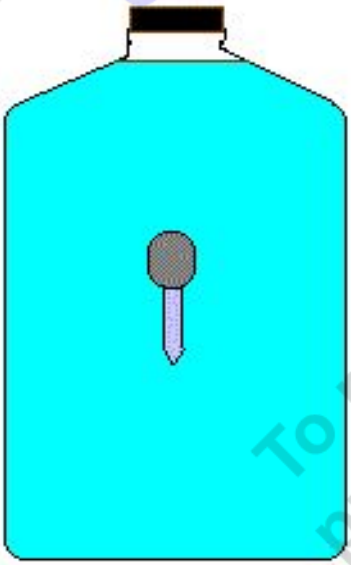
Please describe the principle shown below.



Which Law is being represented below?



Please describe how a Cartesian Diver works using the picture below as a resource.

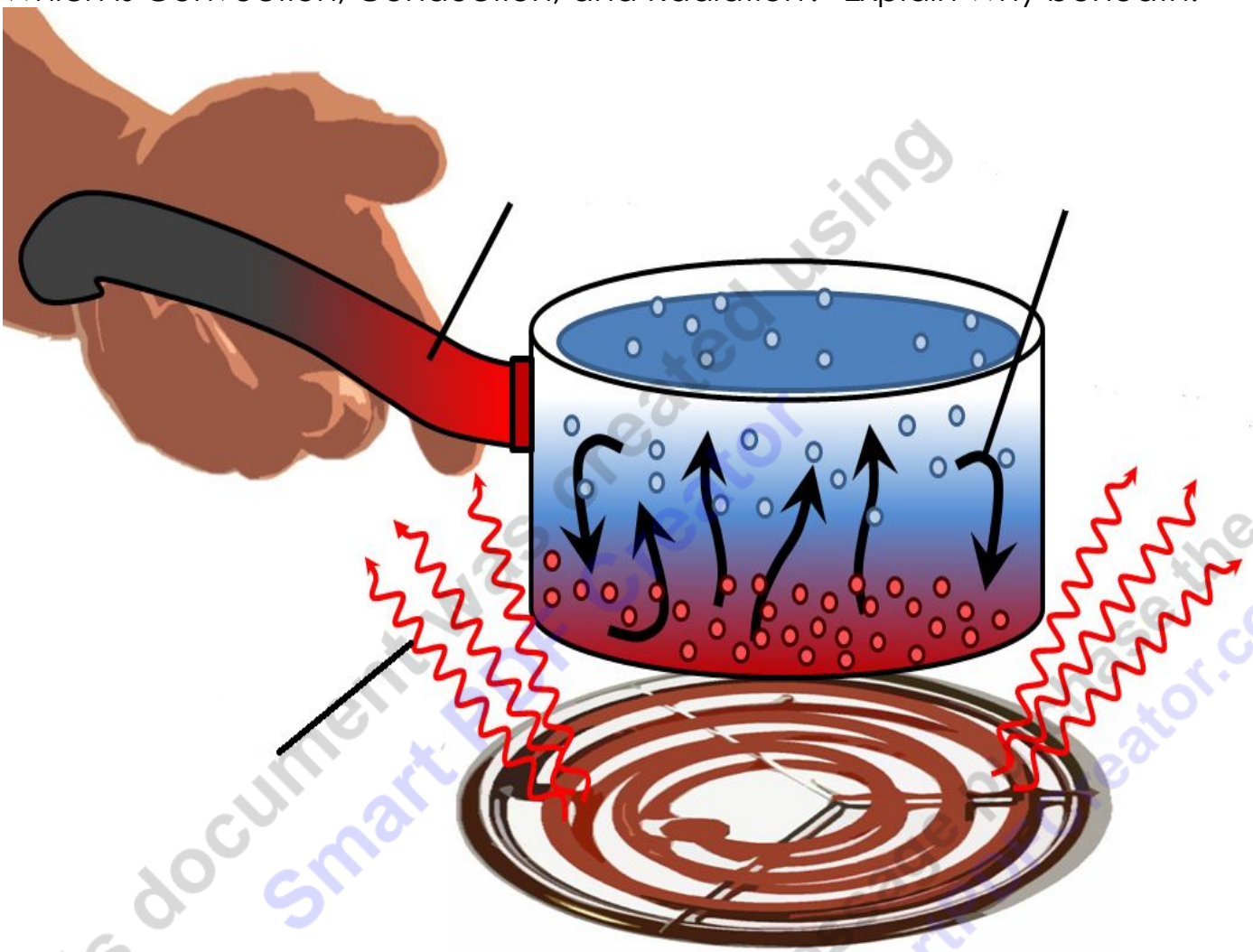


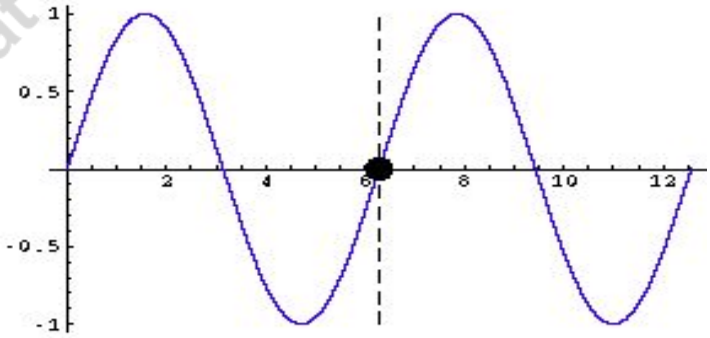
How does the picture on the left relate to the concept that "There is no such thing as a free lunch, AKA TINSTAAFL".

Use the box below to demonstrate knowledge of the seven forms of energy. Make sure to check off each box after you have drawn your specific example. Use text to support your drawings.

☐ Mechanical ☐ Sound ☐Chemical ☐Electrical ☐Light/EM ☐Thermal ☐Nuclear

Which is Convection, Conduction, and Radiation? Explain Why beneath.

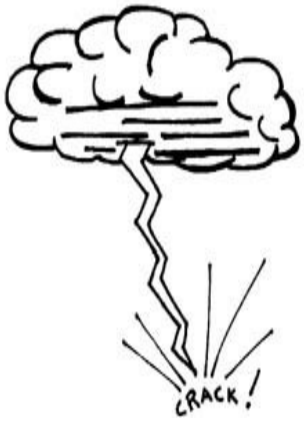


Please draw a convex lens and have it light focusing on the dot on the right.	Please label the wave below with the correct terms.
•	

Please fill in the Electromagnetic Spectrum in the box below. Please include the following as well. Check off each box once complete.

□ All of the waves names, □ In the correct order, □ From large to small, □ Using colors when appropriate, □ and providing one example of how each wave is utilized on earth.

Please describe your understanding of electricity below.

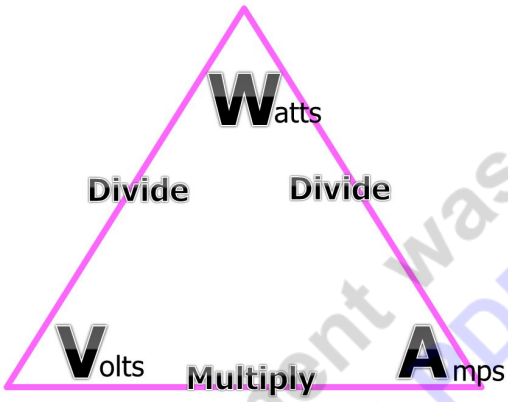


Complete a drawing of the invisible magnetic field based on the bar magnet below.

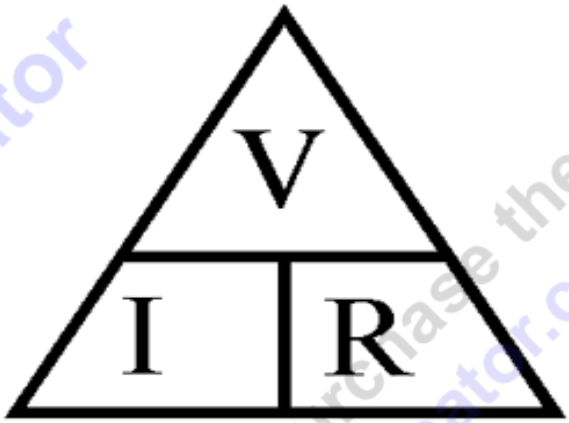
We have a 100 watt light bulb using 5 amps of power.

How many volts does it require?

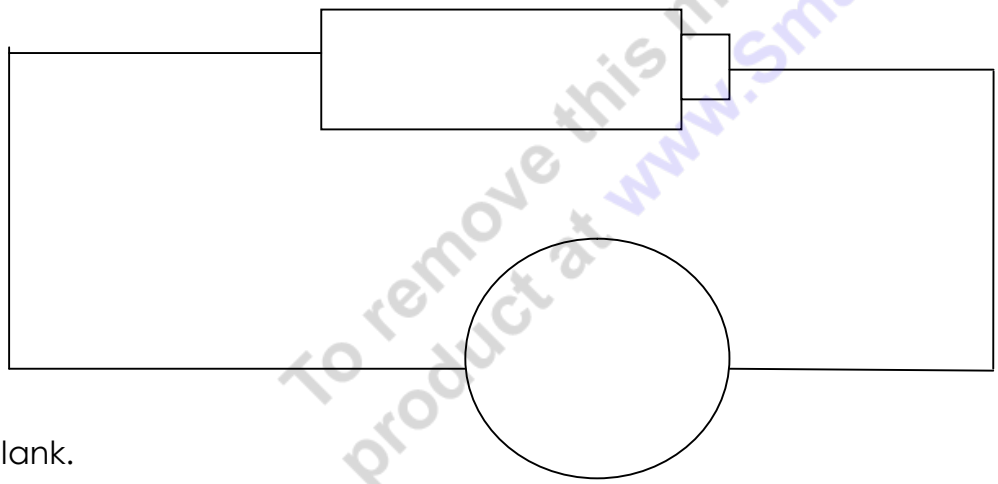
Electrical Current Conversion Triad



Question? A 6 volt battery supplies power to a cordless drill with a resistance of 12 ohms. How much current (I) is flowing through the drill?



Please label the simple circuit below. Include the following in your diagram. Also use the wire to describe conductors and insulators.



Fill in the blank.

_____: This is a measurement of electrical power created.
_____: This is a measurement of the current flow rate of electrons
_____: This is a measure of the force or pressure under which electricity flows
_____: Anything in an electrical circuit that impedes the flow of current

Which law is represented here? Where do we see the useful of this law everyday?	What does this mean? Give me your best middle school attempt.
	

Please fill in the correct words in the paragraph below about the first law of thermodynamics.

First Law of Thermodynamics

This is the law of the conservation of_____. It states that energy can neither be _____, nor can it be_____. This means that the total amount of energy in the universe always remains conserved, or constant. However, energy can be changed from one _____ to _____. There are several different forms of energy, such as_____, _____, _____,_____,_____ , _____,_____. The definition of energy is the ability to do W_____. Thus, with energy, biochemical reactions, the processes of life, can proceed.

Please describe how The Second Law of Thermodynamics and the idea of TINSTAAFL "No free Lunch" are connected to the cheap plastic toy below. It was made in Taiwan.

Match the term to the big concepts in environmental studies.

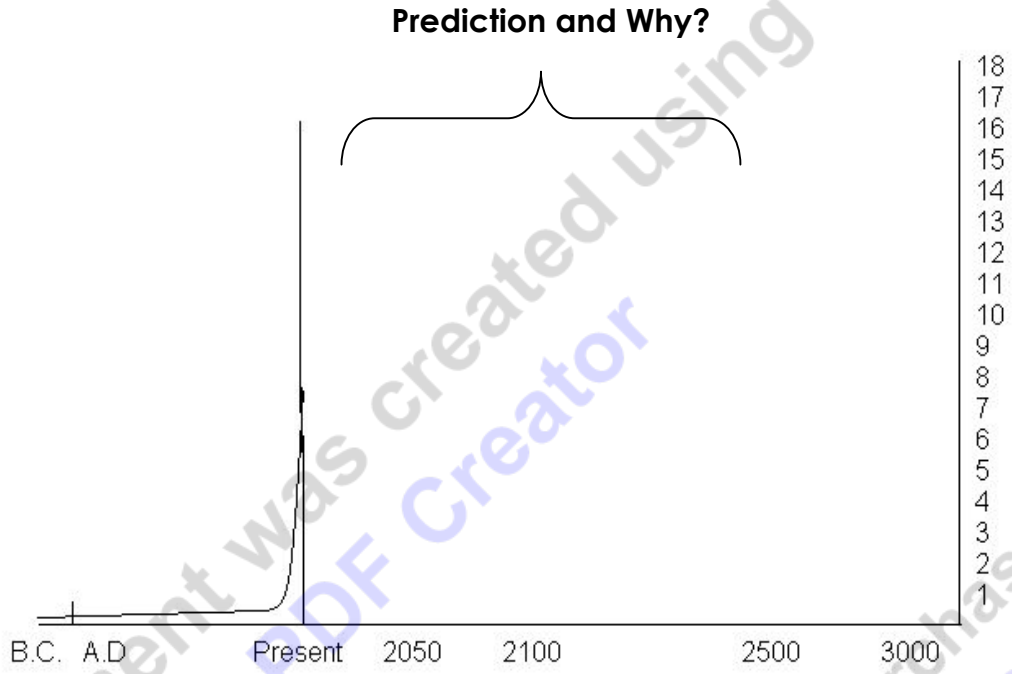
A	B	C	D	E	F
Energy Conversions Underlie all ecological processes	Envs. problems have cultural and social context	The earth itself is one interconnected system	Science is a process	Human survival depends on developing sustainable systems	Humans alter Natural Systems

- 1_____
  - – Humans have an impact on the environment.
  - – Technology and population growth have enabled humans to increase both the rate and scale of their impact on the environment.
- 2_____
  - – Natural systems change over time and space.
  - – Biogeochemical systems vary in ability to recover from disturbances.
- 3_____
  - – Energy cannot be created; it must come from somewhere.
  - – As energy flows through systems, at each step more of it becomes unusable.
- 4_____
  - – Science is a method of learning more about the world.
  - – Science constantly changes the way we understand the world.
- 5_____
  - - A suitable combination of conservation and development is required.
  - – Management of common resources is essential.
- 6_____
  - – Understanding the role of cultural, social and economic factors is vital to the development of solutions.

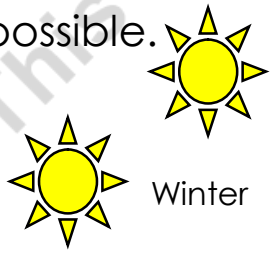
What are the 4 R's, Why do we recycle last? Try to imagine the 4th "R", and describe this somewhere below.

Please fill in the graph below showing human population growth from millions of years ago to present. Please include some key events along that way that affected population growth.

Please reflect on the graph from the previous page. Please make sure you define carrying capacity in your response. Also **make a prediction** by adding to the graph below.



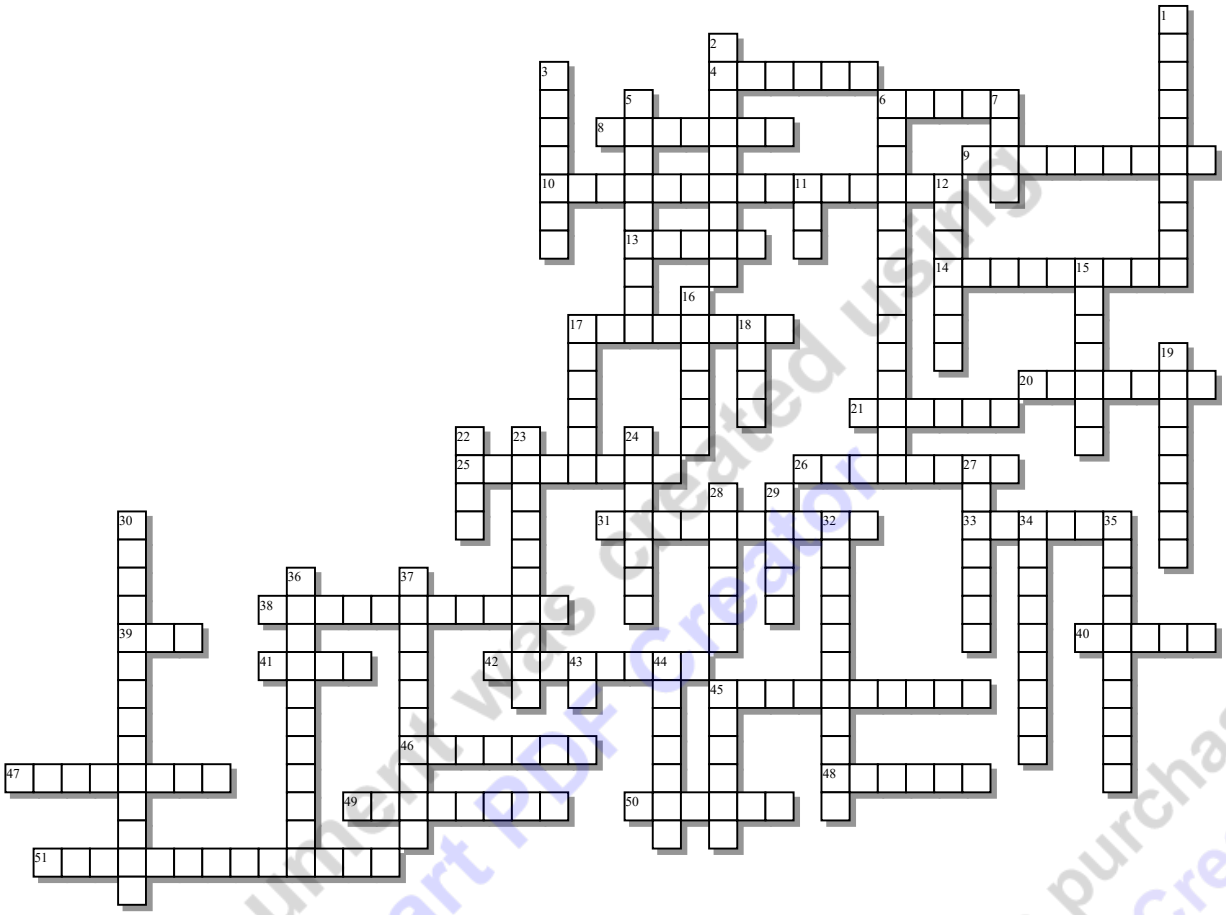
Please decorate a house below with some features that make it sustainable and one that has a little impact on the environment as possible.



Please describe some forms of renewable energy in the boxes below.

Please respond to the movie the 11th hour. Some questions to consider.

Is it really the eleventh hour?
What problems did they highlight?
What solutions did they offer?
What do you think is the future of our civilization?
How will everyone's lifestyle need to change to avoid…?



Across:

4 - Dark _____: A hypothetical form of energy that permeates space and exerts a negative pressure, which would have gravitational effects to account for the differences between the theoretical and observational results of gravitational effects on visible matter.

6 - State of matter that has a definite shape and volume

8 - _____ Molecular Theory: The molecules are in constant motion.

9 - Getting the maximum value for your dollar while living. This is lost nowadays.

10 - The E_____ spectrum: The entire frequency range of electromagnetic waves.

13 - The _____ form of energy. Mechanical, Sound, Chemical, Electrical, Light / Radiant, Heat,

Down:

1 - Anything in an electrical circuit that impedes the flow of current is referred to as resistance

2 - Energy cannot be created or _____ but can diminish in quality from useful to less useful.

3 - This is a flow of electrons, or individual negative charges. C_____

5 - Resistance of liquid to flow.

6 - Meeting the needs of the present without compromising the ability of future generations to meet their own needs.

7 - _____ Matter: A hypothetical form of matter that is believed to make up 90% of the universe; it is invisible (does not absorb or emit light)

11 - A state of matter with no definite shape or volume

Nuclear
14 - This is a type of energy that will be around year after year. R_____ Energy
17 - Type of change where the substances identity does not change identity. P_____ Change
20 - The changing of a magnetic field can create voltage. F_____'s Law
21 - DC: _____ Current
25 - Equal volumes of gases, at the same temperature and pressure, contain the same number of particles, or molecules. A_____'s Laws
26 - This force is equal to the weight of fluid displaced by the body. Bu_____
31 - Longest wave in the EM spectrum.
33 - Anything that has mass and takes up space.
38 - This is related to charges, and both electrons and protons carry a charge.
39 - E=_ _ _
40 - The amount of electricity consumed per second is measured by what are called W_____.
41 - Third Law of Thermodynamics: All molecular movement stops at absolute _____.
42 - Made up of two or more elements bonded together.
45 - This is a theory of the structure of spacetime. General _____
46 - A substance that is made entirely from one type of atom
47 - _____ Radiation: Wavelengths between microwaves and visible light. (heat)
48 - S_____ Law of Thermodynamics: The energy content of the universe is always diminishing in quality.
49 - The change of substances into other substances through a reorganization of the atoms. C_____ Change
50 - Law that deals with confined fluids.
12 - Laws where volume of a gas increases with temperature. C_____ Laws
15 - How much current moves through a wire in one second is measured in _____.
16 - State of matter that has definite volume but not shape
17 - A state of matter that is ionized gas that emits electrons.
18 - A basic unit of matter consisting of a dense, central nucleus surrounded by a cloud of negatively charged electrons.
19 - C_____ Capacity: The amount of food that an area of land will yield and, therefore, the number of people that an area of land will support.
22 - This is a name for a back and forth and up and down movement in physics.
23 - Human _____ Growth. Shows exponential growth after in the last 200 years.
24 - In any physical or chemical change, matter is neither _____ nor destroyed but merely changed from one form to another.
27 - A navigational instrument for determining direction relative to the Earth's magnetic poles.
28 - These fuels are borrowed light: The energy rich organic matter from millions of years ago.
29 - Highest energy, shortest wavelength. Emitted during radioactive decay of a fission product. G_____ RAY
30 - First Law of T_____: Energy can be transformed (changed from one form to another), but it can neither be created nor destroyed.
32 - Believing the ecosphere, rather than any individual organism, is the source and support of all life.
34 - There Is No Such Thing As A Free Lunch

P_____'s Law
51 - By running electric current through a wire, you can create a magnetic field.

35 - The bending of a wave when it enters a medium where it's speed is different.
36 - AC:_____ Current
37 - Principle that states a body that is submerged in a fluid is buoyed up by a force equal in magnitude to the weight of the fluid that is displaced.
43 - The ideal gas Law: _ _ = nRT
44 - The type of energy that deals with the changes in the nucleus of an atom. N_____ Energy
45 - The first R in the 4 R's.

Possible Answers:
Alternating, Amperes, Archimedes, Atom, Avogadro, Buoyancy, Carrying, Charles, Chemical, Compass, Compound, Created, Current, Dark, Destroyed, Direct, Ecocentrism, Electricity, Electromagnet, Electromagnetic, Element, Energy, Faraday, Fossil, Frugality, Gamma, Gas, Infrared, Kinetic, Liquid, Matter, MC2, Nuclear, Pascal, Physical, Plasma, Population, PV, Radiowaves, Reduce, Refraction, Relativity, Renewable, Resistance, Second, Seven, Solid, Sustainability, Thermodynamics, TINSTAAFL, Viscosity, Watts, Wave, Zero