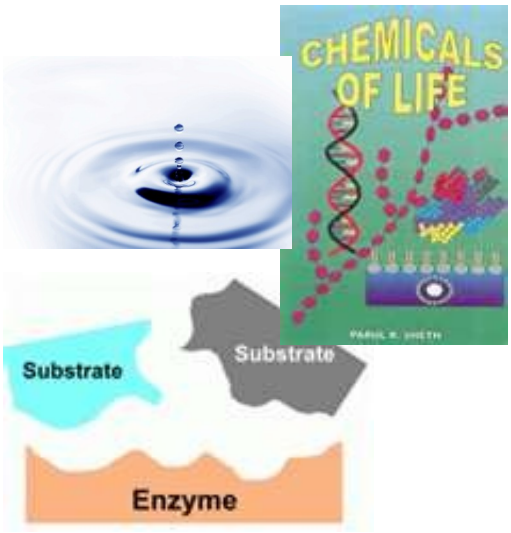
@ NEW SMYRNA BEACH HIGH SCHOOL

Accept our connectedness to events. It is not unknown forces that cause our problems. We are the cause and the cure. We create our own reality and we can change it.

Measurement Topic 9

Water, MacroMolecules, & Enzymes



1. Properties of Water
2. MacroMolecules
3. Enzymes as Catalysts

Properties of.... **WATER** *Chpt 2.2*

Is commonly referred to as the...

Universal Solvent

Because it is everywhere! It is absolutely necessary! Your (1)_____, and the (2)_____ of every living thing on Earth, are mostly water! Water gives your cells _____ & (3)_____ materials within organisms. All the processes necessary for (4) _____ take place in a WATERY environment!!

There are **4 properties** (Polarity, High Specific Heat, Cohesion, Adhesion) that make water an important substance for life:

Polarity

Means that water is a Polar Molecule….

Think of it as a magnet's poles… Polar molecules have a region with..

(5)

Polar molecules like water, form when atoms in a molecule have...

(6)_____ pulls on the electrons they share.

Opposite charges of polar molecules interact to form...

(7)_____ **bonds**

Which are 20 times weaker than other bonds!

Which allows many substances to be surrounded by water molecules... In other words...

Dissolved!

(8) High _____ _____

Which means **water absorbs heat more slowly**, so water resists changes in (9)_____

This property allows us to maintain a **constant internal body temperature** called….

(10) **H _ _ _ _ _ _ _ _ _ S**

One way we do this is by cooling ourselves by...

(11)

Conversely, when it is cold, we try to maintain our body temperature by...

(12)

Water is called a "sticky" molecule—you can see this in: Cohesion & Adhesion

Is an attraction among molecules that are the...

(13)

Cohesion makes water molecules...

(14)

You can see this when…

(15)

Cohesion also produces...

(16)

Water is **'sticky'** so surface tension prevents the surface of the water from stretching or breaking easily… thus producing a kind of (17)_____ on the water, so that some insects will not sink!

Is an attraction among. molecules that are...

(18)

In other words, water molecules...

(19)

Adhesion helps plants...

(16)

...because water molecules (17) _____ to the sides of the xylem vessels that carry water.

MT 09

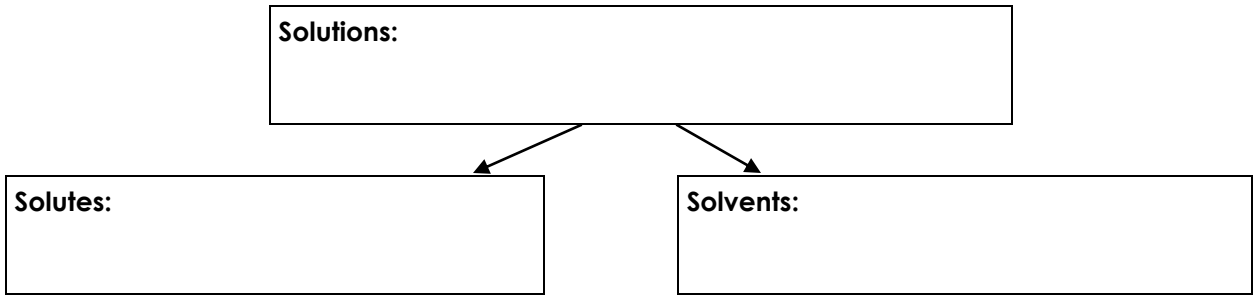
Water

Reading Comprehension Worksheet

Part 1, Water, cont.

- Sugars, oxygen, nutrients, waste, and other compounds (i.e. big stuff) etc. **CANNOT be transported** from one place to the other in a living thing or take part in the chemical reactions in our bodies **UNLESS they are DISSOLVED in water**! The fact that water is STICKY allows it to stick to other substances and thus dissolve those substances so they can move from one area to the other in a living thing!

1. A solution is made up of two parts. Define what a solution is and the two parts that make up a Solution:



2. There are many examples of solutes and solvents, both in the human body and out:
   A. What is the **solute** in human blood?_____;
   the **solvent**? _____

   B. In a glass of instant tea, what is the **solute**?_____;
   the **solvent**?_____

   C. In a glass of chocolate milk using Nestle's powder, what is the **solute**?_____;
   the **solvent**?_____

   D. Vinegar contains about 5% of what is called acetic acid and 95% water. Which of those is the **solute**? _____; the **solvent?** _____

   E. One thing to remember is that the solvent is present in the **greatest/lowest** amount? (choose one)

(water lab)

MT 09 pH

Reading Comprehension Worksheet

Part 2: pH

1. Some compounds break up into ions (charged particles) when they dissolve in water. When a substance is called an ACID or a BASE, it means how much hydrogen the substance has = **pH** = **presence of Hydrogen**

Acids =	**Neutral =**	**Base** =
pH range =	pH range =	pH range =

2. Most organisms need to keep their pH within a narrow range: _____; although some like a very acidic or basic environment.

3. pH is regulated by substances called _____ which help prevent any large changes.

   A. Just a small change in pH can disrupt processes that take place in your cells each and every moment of the day. A slight change can be **_____!**

   B. The point to keeping our pH at a certain range is to help the body stay in a steady state; also known as MAINTAINING _____ !

(pH lab)

The Compounds of Life

Macromolecules: 4 MAJOR CARBON-BASED MOLECULES FOUND IN LIVING THINGS:

Carbon is called the "Building Block of Life" because _____ _____ Carbon has unique bonding properties, so it can from bonds with up to 4 other molecules giving it 3 structures… _____ chains, _____ chains, and _____.So Carbon can form very small molecules to very large, complex molecules called MACROMOLECULES, which are large molecules made up of smaller molecules—the small molecules are subunits called _____; when these are linked together they forma chain called a _____.

There are 4 MAIN CARBON-BASED COMPOUNDS OF LIFE:

CARBOHYDRATES
Are composed of **C, H,** & **O**

includes examples like...

2._____
3._____

Carbs can be broken down to provide a source of...

4. _____ for both plants & animals!

5. They are also a major part of _____ _____, Specifically the cell walls of plants; it gives structural support.

LIPIDS
Composed of **C** chains + **O** & **H**

includes examples like...

5._____
6._____
7._____

Lipids are broken down & used as a...

8._____ _____

Others make up part of a cells...

9._____ _____, specifically the **cell membrane**.

Cholesterol is a lipid that can clog your arteries…. BUT it can be good because...

10._____ _____ _____

PROTEINS
Most varied of **C-based** molecules

Is a polymer (long chains) **of monomers** (smaller subunits)...called

12._____

Proteins are at work in...

13._____

14._____

15._____

- Proteins also carry oxygen in blood

NUCLEIC ACIDS
Store detailed instructions to build **proteins**...

… and are polymers made up of

17._____

Nucleic Acids have just one function...

18._____ _____ _____ _____

FYI there are 2 types of Nucleic Acids...

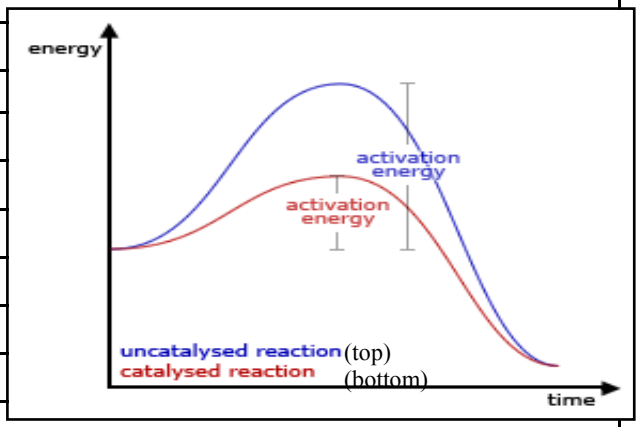
DNA: **D**eoxyribo**N**ucleic **A**cid

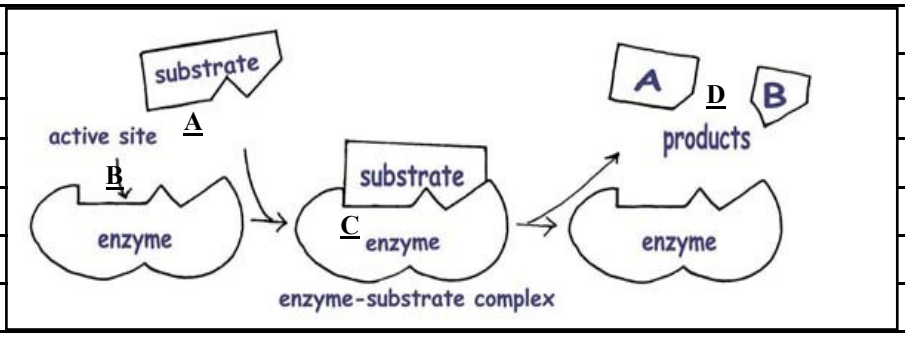
RNA: **R**ibo**N**ucleic **A**cid

NOTES

TOPIC: Enzymes, Section 2.5

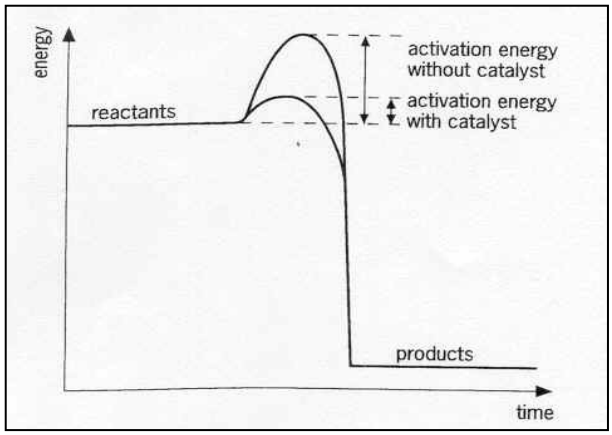
Possible Test Questions	***Notes:***
1. What are **enzymes?**	**1.**
** Make sure you understand the*	
*term **CATALYST***	
2. What is the importance	**2.**
of enzymes?	
3. What is **activation**	**3.**
energy? (page 53)	
4. Refer to graph at right :	**4.**
Does activation energy	
raise or lower in the	
presence of an enzyme?	
A Catalysed means...	**A.**
B. Uncatalysed means...	**B.**
5. Describe each part of	
the Enzyme- Substrate	
Complex diagram:	
	A. Substrate =
	B. Active Site =
	C. E-S Complex =
	D. Products =



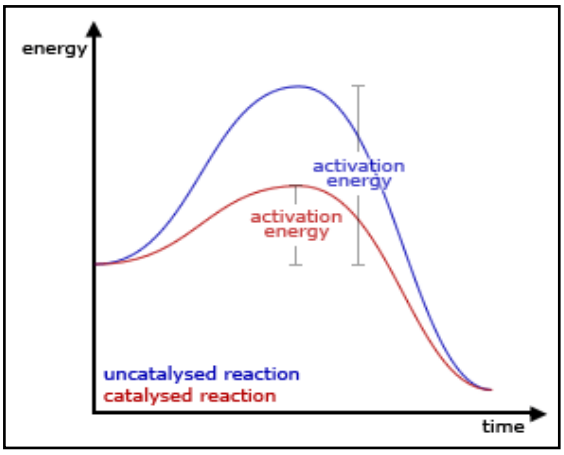


Review of Activation Energy Graphs

Refer to the graph at the right for questions 1-5.



1. What is the independent variable?_____
2. What is the dependent variable?_____
3. Does activation <u>with</u> OR <u>without</u> a catalyst use more energy?
4. What is a catalyst?_____
5. Just as in a written chemical reaction, reactants are on the _____ of an equation and products are on the _____ of an equation..



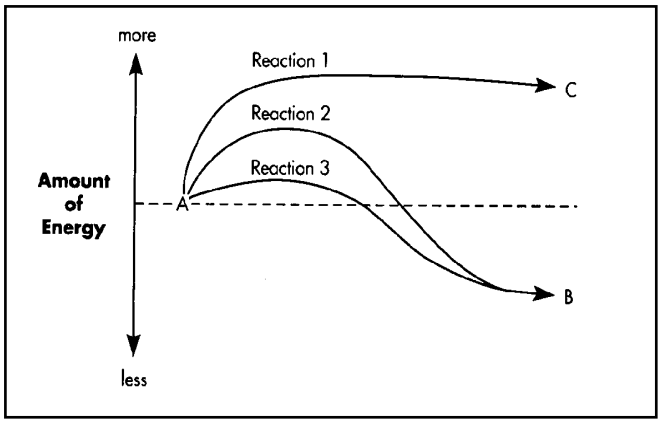
Refer to the graph at the left for questions 6-9.

6. What is the independent variable?_____
7. What is the dependent variable?_____
8. What does the phrase 'uncatalysed reaction' mean?_____

_____

9. Does an enzyme <u>raise</u> OR <u>lower</u> the activation energy required to initiate a chemical reaction? _____

Refer to the graph at the right for questions 10 & 11



10. Which of the following statements regarding the graph is true?
    A. Reaction 2 occurs faster than Reaction 3 because Reaction 2 requires more energy than Reaction 3.
    B. The difference between the graphs shown for Reaction 2 and Reaction 3 is because of a difference in the activation energy of these reactions.
    C. Reactant A contains more energy at the beginning of the reaction than product C has after the reaction.
    D. All of the above

11. Reaction 3 in the graph
    A. probably occurred in the presence of a catalyst.
    B. requires more activation energy than Reaction 2.
    C. is the same as Reaction 1, but faster.
    D. is slower than Reaction 2.