Chapter 2 Biology Review

Scientific Method

* Parts to the Scientific Method
  + Problem – Observing
  + Hypotheses- educated guess
  + Experiment
    - Control- never changes
    - Variable- the change
      * Independent- what you manipulate
      * Dependent- what is measured (outcome)
* Conclusion
* Items in an experiment
  + Safety goggles, gloves, apron
  + Graduated Cylinder
* What does a graduated cylinder measure?
  + Liquid volume
* Interpreting Graphs
  + X –independent variable- the thing you manipulate
  + Y – Dependent variable – the outcome, what you’re trying to find out.
* Microscope-magnifies
  + How do I get total magnification power?
  + Objective times the eyepiece (or ocular)
* Biochemistry
  + Organic Compounds: What makes them organic?
    - Contains Carbon
* Water (H20) is inorganic
* Water is a polar compound: it dissolves
* A water molecule is slightly positively charged on one side and slightly negatively charged on the other side. Makes it cohesive; sticks to itself.
* Anything polar can dissolve in water.
* Non polar does not dissolve in water (fats, lipids)
* Four Organic Compounds
  + Carbohydrates
    - Sugars and starches
    - Sugars, glucose, sucrose
    - Monosaccharide, disaccharides, polysaccharides
    - Gives Energy
    - Organelle associated with energy; mitochondria
* Lipids (Fats)
  + Non polar: doesn’t dissolve in water
  + Cell Membrane made of lipids
  + Lipids store energy
  + It is important for a cell membrane to be a lipid because a rigid wall would break down
  + Other examples, oil, steroids, wax
* Proteins
  + Made up of smaller units (monomers) of amino acids
  + Enzymes are made of proteins
  + Function of enzymes; speeds of chemical reactions
  + Most enzymes end in *ase*
  + What can change an enzyme? pH and temperature, changes the shape of the enzyme
  + If an enzyme changes shape, it doesn’t work.
* Nucleic Acids
  + DNA and RNA
  + Stores genetic information
  + Found in chromosomes
  + Found in the nucleus
  + DNA- double helix, dexyribose nucleic acid, ATCG, has thymine
  + RNA- single strand, ribose nucleic acid, AUCG, has uracil
  + Replication: DNA copies DNA
  + A nucleotide is a section of DNA, consist of a sugar, phosphate, and a nitrogen base.
* Enzymes
  + Affected by pH and temperature
  + Enzymes have certain shapes
  + Change the shape and the enzyme doesn’t work
  + Substrates
  + Substance the enzyme works on
  + Enzymes end is *ase*
  + Lact*ase* acts on Lact*ose*
  + Enzymes made of amino acids
* Homeostasis and Metabolism
  + Metabolism: all of the chemical activities that take place in an organism
  + Homeostasis: Balance or equilibrium
    - All of your body systems work together
* Levels of organization
  + Cells
  + Tissues
  + Organs
  + Organ system
  + Organism

* OSMOSIS  
  (DIFFUSION OF WATER)
  + **WATER** MOVES FROM AN AREA OF HIGH CONCENTRATION TO AN AREA OF LOW CONCENTRATION THROUGH A **MEMBRANE.**
  + IS WATER PART OF A SOLUTION?
  + WHAT ARE THE TWO PARTS TO A SOLUTION?
  + 1. SOLVENT AND SOLUTE.
* *DIFFUSION*
* *GIVE EXAMPLES:*
  + 1. SUGAR GOING INTO A CELL.
  + 2. WASTE LEAVING A CELL.
  + 3. OXYGEN GOING INTO A CELL.
  + 4. CARBON DIOXIDE GOING OUT OF THE CELL.
* MOVEMENT OF SUBSTANCES FROM AREAS OF HIGH CONCENTRATION TO LOW CONCENTRATION.
* WHAT IS A SOLVENT?
  + 1. THAT WHICH CAUSES THE DISSOLVING.
* WHAT IS A SOLUTE?
  + THAT WHICH IS DISSOLVING.
* TYPES OF SOLUTIONS
  + 1. ISOTONIC – A BALANCED SOLUTION.
  + 2. HYPOTONIC – MORE SOLVENT THAN SOLUTE. MORE WATER THAN SUGAR.
  + 3. HYPERTONIC – MORE SOLUTE THAN SOLVENT. MORE SUGAR THAN WATER.
* DRAW A CELL WHICH IS HYPOTONIC SURROUNDED BY A SOLUTION WHICH IS HYPERTONIC IN SALT.
* DRAW A CELL WHICH IS HYPERTONIC IN SALT SURROUNDED BY A SOLUTION WHICH IS HYPOTONIC.
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* PH SCALE
* THE SCALE MEASURES?
  + 1. ACIDS AND BASES
* WHAT NUMBERS MAKE UP THE SCALE?
  + 1. ZERO (0) TO FOURTEEN (14).
* WHAT NUMBERS SHOW AN ACID?
  + 0 TO 6
* WHAT NUMBERS SHOW A BASE?
* 7 TO 14
* WHAT DOES THE NUMBER 7 SHOW?
  + NEUTRAL: NOT AN ACID OR A BASE.