Biology Fall Final Exam Study Guide:

- Unit 1: Nature of Science/ Experimental Design
 - 1. What is a scientific theory? AN EXPLANATION OF PHENOMENA!
 - 2. What is a hypothesis? How should it be written? AN EDUCATED GUESS OR PREDICTION SHOULD BE WRITTEN IN A WAY THAT ENABLES IT TO BE TESTED.
 - 3. What should scientists do if their findings do not support their hypothesis? TRY AGAIN OR DO MORE DATA
 - How many changing variables should a good experimental design have?
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 - 5. What is the independent variable? THE VARIABLE THAT IS CHANGED
 - 6. What does quantitatively mean? THE AMOUNT, MEASURED USING NUMBERS
 - 7. What does qualitative mean? A DESCRIPTION
 - 8. What is the dependent variable? WHAT IS BEING MEASURED
 - 9. What are constants? THINGS THAT ARE NOT CHANGED IN AN EXPERIMENT
 - 10. What is the control variable? THE GROUP THAT DOES NOT GET TREATMENT
 - 11. What are the characteristics of life? ORGANIZATION, CELLS, GROWTH, RESPONDING, AND REPRODUCING

Unit 2: Biochemistry

- 1. What are the 3 subatomic particles of an atom? PROTONS, NEUTRONS, AND ELECTRONS
- 2. What is an ionic bond? Give an example. WHEN ELECTRONS ARE TRANSFERRED BETWEEN ATOMS. NaCl
- 3. What is a covalent bond? Give an example. WHEN TWO ATOMS SHARE THEIR OUTER ELECTRONS.
- 4. What property allows water to be the universal solvent? BECAUSE IT IS A POLAR MOLECULE.
- 5. Why is water a liquid at room temperature? BECAUSE OF ITS HYDROGEN BONDS
- 6. Why is water considered a polar molecule? THE OXYGEN IS SLIGHTLY NEGATIVE AND THE HYDROGENS ARE SLIGHTLY POSITIVE.
- 7. What is the pH scale?1-6.9=ACIDS 7=NEUTRAL 7.1-14=BASES
- 8. What are hydroxide ions (OH) and what type of solution has a higher concentration of them? THE ION THAT BASES HAVE A LOT OF.
- 9. What are hydrogen ions (H⁺) and what type of solution has a higher concentration of them? THE ION THAT ACIDS HAVE A LOT OF.
- 10. What makes a compound organic? CARBON
- 11. Does water give energy needed for bodily functions? NO
- 12. What is an element proteins have that carbohydrates and lipids do not have? NITROGEN (N)

- 13. What do fats do better than carbohydrates (sugars)? THEY ARE MORE EFFICIENT WHEN IT COMES TO STORING FAT.
- 1. What organic group do starches and sugars belong to? CARBOHYDRATES
- 2. What do carbohydrates look like? A HEXAGON
- 3. What do lipids (fats) look like? A LONG CHAIN OF CARBONS AND HYDROGENS
- 4. What do proteins look like? A ZIG ZAG
- 5. What do enzymes do for a chemical reaction? REDUCE THE ACTIVATION ENERGY AND SPEED UP THE REACTION
- 6. Are enzymes depleted during a chemical reaction? NO

Unit 3: The Cell

- 1. What is the difference between Eukaryotes and Prokaryotes? PROKARYOTIC CELLS HAVE NO NUCLEUS
- 2. What groups belong to Prokaryotes? BACTERIA
- 3. What groups belong to Eukaryotes? PLANTS, ANIMALS, FUNGUS, PROTISTS
- 4. What does a prokaryotic cell look like?



Flagellum

- 6. What are the 3 differences between a plant cell and an animal cell? CHLOROPLAST, CELL WALL, CENTRAL VACUOLE
- 7. What organelle does photosynthesis happen in? CHLOROPLAST
- 8. What organelle makes proteins? RIBOSOMES
- 9. What do lysosomes do? BREAK DOWN LARGE MOLECULES
- 10. What does the Golgi apparatus do? PROCESS AND PACKAGE MATERIALS
- 11. What does the nucleus of a cell do? CELL REGULATION
- 12. What does hypertonic mean? HIGHER INSIDE THE CELL, SO WATER MOVES OUT
- 13. What does hypotonic mean? HIGHER OUTSIDE THE CELL, SO WATER MOVES IN
- 14. What does isotonic mean? EQUAL CONCENTRATION
- 15. What is facilitated diffusion? A CARRIER OR CHANNEL PROTEIN HELPS A MOLECULE MOVE ACROSS A MEMBRANE FROM AN AREA OF HIGH CONCENTRATION TO LOW CONCENTRATION
- 16. What is simple diffusion? Give an example. WHEN MOLECULES LIKE OXYGEN MOVE FROM HIGH TO LOW

17. What does selectively permeable mean?

ONLY CERTAIN THINGS CAN PASS ACROSS THE MEMBRANE

- 18. What is the movement of water called? OSMOSIS
- 19. Draw the phases of mitosis in order.



Unit 4: Photosynthesis and Cellular Respiration

- 1. What are the two types of tissue in the roots of plants? What do they each carry? XYLEM-WATER, PHLOEM-SUGAR
- 2. Why would a leaf need to be flat? SO THEY CAN ABSORB SUNLIGHT
- 3. What is the male reproductive part of the flower? What does it carry? **STAMEN, POLLEN**
- 4. What is the female reproductive part of the flower? What does it hold? **PISTIL, EGGS**
- 5. Where does photosynthesis happen? CHLOROPLAST
- 6. What is the chemical equation for photosynthesis? (Include sunlight) $6CO_2 + 6H_2O + Energy \rightarrow 6O_2 + C_6H_{12}O_6$
- 7. What product of photosynthesis stores energy? GLUCOSE
- 8. What is the purpose of cellular respiration? CONVERT ENERGY INTO A USABLE FORM
- 9. What type of respiration do yeast do under anaerobic (no oxygen) conditions? ALCOHOLIC FERMENTATION, PRODUCES ALCOHOL, CARBON DIOXIDE, AND ATP
- 10. Where does cellular respiration happen? MITOCHONDRIA
- 11. What is the chemical equation for cellular respiration? $C_6H_{12}O_6 + 6O_2 \rightarrow 6 CO_2 + 6 H_2O$ +energy
- 12. What are the reactants of the cellular respiration equation? $$C_6H_{12}O_6+6O_2$$
- 13. What are the products of the cellular respiration equation? $6 \text{CO}_2 + 6 \text{H}_2\text{O}$ +energy

Unit 5: Protein Synthesis

- 1. What is the flow of information in protein synthesis? DNA TO RNA TO PROTEIN
- 2. What is DNA? STORES ALL GENETIC MATERIAL
- 3. What is DNA replication? What are the base pair rules? MAKING AN EXACT REPLICA OF THE DNA. A=T, T=A, G=C, C=G
- 4. What is RNA? RIBONUCLEIC ACID
- 5. How is DNA different from RNA? RNA IS SINGLE STRANDED, DNA IS DOUBLE STRANDED
- 6. What is a codon?A 3 LETTER SEQUENCE OF RNA
- 7. What is transcription? What are the base pair rules? DNA TO RNA. A=U, T=A, C=G, G=C
- How many nitrogen bases does it take to code for 1 amino acid?
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- 9. What is translation? RNA TO PROTEIN
- 10. What is an amino acid? THE BUILDING BLOCKS OF PROTEIN. CODED FOR BY RNA CODONS.
- 11. What is a protein? A CHAIN OF AMINO ACIDS