

# Semester 1 Final Exam Study Guide

## Unit 1: Structure & Function

*Related Textbook Chapters: 1.1, 1.3, 2.1, 2.3, 7.3, 7.4 and pg. 732-733 & pg. 808-809*

### **Vocabulary for this Unit:**

Atom	Positive Feedback	Polymer
Molecule	Semi-permeable	Carbohydrate
Cell	Solute	Monosaccharide
Tissue	Solvent	Polysaccharide
Organ	Diffusion	Lipid
Organ System	Osmosis	Saturated
Cell Differentiation	Hypertonic	Unsaturated
Stimuli	Hypotonic	Protein
Response	Isotonic	Antibodies
Homeostasis	Organic Molecule	Amino acids
Negative Feedback	Monomer	Polypeptide

### Hierarchy of Life

- Know the organization of matter and life, from the smallest parts to the largest parts
- Understand the purpose of our major body systems (digestive, circulatory, respiratory, nervous system).
- Be able to identify an organic molecule when written out with chemical symbols.

### Homeostasis & Feedback

- Understand what homeostasis is, and how the body responds to stimuli in order to maintain it.
- Be able to explain a negative feedback loop, and a positive feedback loop, and the difference between the two.
- Know that most feedback mechanisms tend to be negative feedback mechanisms.

### Cell Transport

- Understand the concept of diffusion, and how it strives to achieve equilibrium.
- Know what osmosis is, and how water moves across a semipermeable membrane in order to equalize concentrations.
- Be able to explain our egg osmosis lab, and what happens when you place a cell in a hypertonic, hypotonic, and isotonic solution.
- Know what happens to the water movement once the cell and solution are at equilibrium.

### Macromolecules

- Know the following about each of the four macromolecules (Carbohydrates, Lipids, Proteins, Nucleic Acids):
  - Function (what it does for you)
  - Monomer (building block)
  - Polymer (complex structure)
  - Elements found in each
  - Examples of each
- Know what an organic molecule is, and what it must contain to be organic.
- Understand what we did in the Vomit Lab, and be able to explain your results.

## **Unit 2: Energy Flow in Ecosystems**

*Related Textbook Chapters: 3.2-3.3, 8.1-8.3, 9.1-9.3 & pg. 82-83*

### **Vocabulary for this Unit:**

Photosynthesis	Aerobic respiration	Biosphere
Autotroph	Anaerobic respiration	Biome
Chlorophyll	Fermentation	Ecosystem
Chloroplasts	Biomass Pyramid	Community
Pigment	Energy Pyramid	Population
Cellular Respiration	Food chain	Species
Heterotroph	Food web	Carbon cycle
ATP	Energy pyramid	

### **Energy & Life**

- Know how to release energy from ATP
- Know that ADP forms when ATP releases energy
- Be able to identify an ATP molecule vs. an ADP molecule
  
- Know the equation for Photosynthesis  
 $6\text{CO}_2 + 6\text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$
- This process takes place in plant cells only!
- Know where chlorophyll is found, and what the function of it is.
- Understand the reactants of photosynthesis (what goes in) and the products (what comes out).
- Know why plants look green
- Know where the light dependent reactions and the Calvin Cycle take place in the chloroplast
- Know that the purpose of the Calvin Cycle is to convert  $\text{CO}_2$  into carbohydrates (sugars)
- Know the 3 factors that affect photosynthesis (water availability, light intensity, and temperature)

### **Cellular Respiration**

- Know the equation for cell respiration  
 $6\text{O}_2 + \text{C}_6\text{H}_{12}\text{O}_6 \rightarrow 6\text{CO}_2 + 6\text{H}_2\text{O} + \text{Energy}$
- This process takes place all eukaryotic cells (animals AND plants)
- Understand the reactants of cellular respiration (what goes in) and the products (what comes out).
- Know the steps in order.
- Know where each step of cell respiration happens in the cell
- Know how many ATP we make in cellular respiration.
- Know the starting molecule for glycolysis = glucose & krebs cycle = pyruvate
- Know whether cellular respiration is an aerobic process or an anaerobic process.
- Know how photosynthesis and cellular respiration processes are connected.

### **Fermentation**

- Know how many ATP are made in fermentation.

### **Food Webs & Carbon Cycle**

- Know the role of producers and consumers in a food web.
- Understand the Energy Pyramid, and be able to describe what it shows.
- Know that energy flows in one direction, while nutrients recycle.
- Understand the Biomass Pyramid and what it shows.
- Be able to interpret a diagram of the carbon cycle.

## **Unit 3:Ecology**

*Related Textbook Chapters: 4.1-4.4, 5.1-5.3, 6.1-6.3*

### **Vocabulary for this Unit:**

Habitat	Secondary succession	Logistic growth
Niche	Pollution	Biodiversity
Predation	Habitat fragmentation	Invasive species
Competition	Emigration	Abiotic factor
Symbiosis	Immigration	Biotic factor
Mutualism	Carrying capacity	Community
Commensalism	Density dependent limiting factor	Population
Parasitism	Density independent limiting factor	Biodiversity
Primary succession	Exponential growth	

### **Ecological Relationships**

- Know the difference between habitat and niche
- Be able to describe the three types of ecological relationships
- Also be able to define and give an example of each of the types of symbioses

### **Global Warming and Succession**

- Know the two types of succession and where each can occur
- Understand how global warming links to the carbon cycle.
- Why do farmers burn their fields in a controlled burn?
- Know what the major sources of pollution are on our planet.
- Be able to explain how cutting down rainforests promotes global warming.
- How does the human population affect

### **Populations**

- Know how to use a population distribution map and a population density map
- Know the difference between immigration and emigration.
- Know what the difference is between exponential growth and logistic growth, and know what each look like on a graph.
- What is carrying capacity, and what does the graph look like?
  - Be able to suggest things that reduce carrying capacity for a given area/population.
- Be able to explain why limiting factors (both density dependent and density independent) reduce populations.
- What are two ways that a population can decrease in size?
- What are two ways that a population can increase in size?

### **Invasive Species & Biodiversity**

- Know what an invasive species is, and the dangers they pose toward native populations.
- Know the major causes of reduced biodiversity
- What are the repercussions of having reduced biodiversity?
- Know what biological magnification is.