

Name: _____ Date: _____

Biology Mid-Term Study Guide

Date of midterm exam: Jan 26 Time of midterm exam: 9:35AM (Block 2)

DON'T BE LATE!

Exam Room: _____

This study guide packet is meant to help prepare for the mid-term exam.

The review covers the chapters in the first and second marking period.

To properly prepare for the exam you should:

1. Review this packet
2. Organize and review your notes
3. Review old tests & quizzes
4. Start Early!!

Bring to the exam: A #2 pencil with an eraser and a book or magazine to occupy you should you finish early. You will not be able to leave and go to your locker so bring everything with you.

Exam Structure

Part I: 145 multiple choice items

Part II: 5 short answer questions

Part III: One essay question

Good Luck!

Remember: Your exam accounts for 10% of your final grade!

Chapter 1: The Science of Biology

1. List and discuss the 8 characteristics of all living things:

- 1)
- 2)
- 3)
- 4)
- 5)
- 6)
- 7)
- 8)

2. What is biology?

3. What is homeostasis?

4. Define sexual and asexual reproduction.

Experimental Design

5. Read the experimental design and answer the questions:

A group of students was trying to determine which type of soil would rose bushes grow the tallest in. They had five rose bushes that they planted in five different types of soil. The size of the pots were the same, they were watered the same amount and kept in the same light and temperature conditions.

a. Identify the problem that needs to be studied or investigated?

b. What was the manipulated variable?

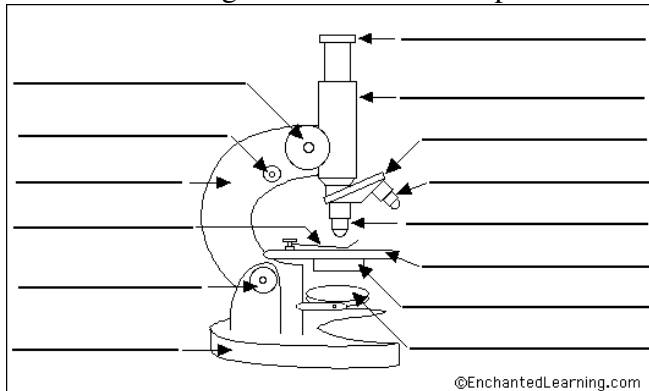
c. What was the responding variable?

d. Determine the controlled variables in the experimental design.

6. Another group of students were trying to determine at what temperature a newly discovered fish will thrive. They set up four different aquariums and kept each at different temperatures. They put 100 fish in each tank and then counted how many were alive at the end of a week.
 - a. What was the problem?
 - b. What was the independent (manipulated) variable?
 - c. What was the dependent (responding) variable?
 - d. What conditions need to be kept constant (controlled) during the experiment?

Microscopes

1. Label the diagram of the microscope.



4. What is the function of the following parts of the microscope?
 - a. diaphragm:
 - b. coarse adjustment:
 - c. fine adjustment:
 - d. stage clips:
 - e. eyepiece
 - f. scanning objective
5. Distinguish light compound and electron microscope in terms of magnification.
6. How are Scanning Electron Microscope and Tunneling Electron Microscope used?

Chapter 2: Chemistry of Life

1. Give the location and charges of the 3 subatomic particles in an atom.
2. What is an isotope?
3. What is the atomic number of an atom? What is the atomic mass of an atom?
4. What is the pH scale? Draw the scale and show where acids and bases are located.
5. What is a catalyst?
6. What factors affect enzyme catalyzed reactions?
7. What is activation energy and what effect do enzymes have on the activation energy of chemical reactions?

Organic Chemistry:

1. What is an organic compound?

2. Fill out the following table about organic compounds:

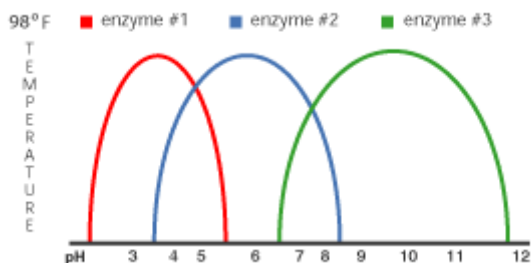
Organic Compound	Monomer	Examples	Where is it found in the body
Protein			
Carbohydrate			
Lipid			
Nucleic Acid			

3. What is an enzyme?

4. What is the lock and key model of enzyme activity? Use the following terms in your description (active site, enzyme, products, substrate).

5. For each of the following statements, label as true or false

- _____ a. Enzymes are types of proteins
- _____ b. Enzymes slow down the rate of chemical reactions
- _____ c. Each enzyme is specific, it only works on one type of substance
- _____ d. Enzymes become denatured (melt) at high temperatures
- _____ e. Enzymes work best at a narrow pH range
- _____ f. Enzymes can not be reused.
- _____ g. Proteins are made of building blocks called amino acids
- _____ h. Proteins are made in the mitochondria of cells
- _____ i. Proteins make up our blood, hair, skin, heart, muscles, and bones



6. Use the graphs above to answer the questions:

- a. Does enzyme number one function at a pH of 5.5? _____
- b. What is the best pH for enzyme number two? _____
- c. Which enzyme has the broadest pH range? _____

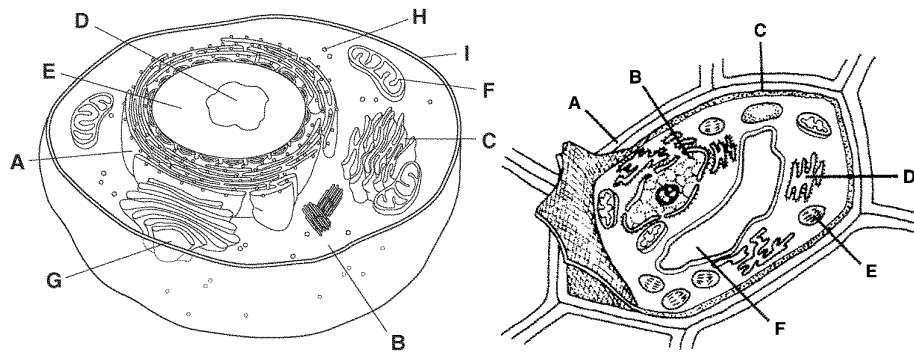
Chapter 3 and 4: Ecology and Biomes: You should be able to explain the following:

1. What is ecology?
2. Outline the six different levels of organization that ecologists study, in order from smallest to largest.
3. What ecological method would use to determine if the water in a certain stream is safe to drink?
4. Where does the energy for life processes come from?
5. How does energy flow through living systems?
6. How efficient is the energy among organisms in an ecosystem?
7. Give example of heterotroph and autotroph.
8. Give an example of a food chain and a food web.
9. Draw an energy pyramid for a five-step food chain. If 100 percent of the energy is available at the first trophic level, what percentage of the total energy is available at the highest trophic level?
10. How does the way that matter (water, carbon, nitrogen and phosphorous) flows through an ecosystem differ from the way that energy flows?
11. Identify three different biomes found on earth.
12. How are the three types of symbiotic relationships different?

Chapter 7: Cell Structure and Function

1. What is a cell?
2. What are the three parts of the cell theory?
3. What is a prokaryotic cell? What is a eukaryotic cell?
4. What are three differences between a plant cell and an animal cell?
5. Matching: Next to each organelle, write the letter of its function
_____ mitochondria a. where proteins are made
_____ cell membrane b. site of photosynthesis in plants, contains chlorophyll
_____ cell wall c. transport system of the cell
_____ endoplasmic reticulum d. provides support and protection for plant cell
_____ nucleus e. storage area for the cells
_____ Vacuole f. powerhouse of the cell, makes energy
_____ chloroplasts H. control center of the cell contains the genetic information.
_____ ribosome i. is selectively permeable, controls what goes in and out of the cell
6. Explain the function of the Golgi apparatus, lysosome, and cytoskeleton.

7. Label the diagrams of the cells below:



Animal Cell:

- A.
- B.
- C.
- D.
- E.
- F.
- G.
- H.

I.

Plant Cell:

- A.
- B.
- C.
- D.
- E.
- F.

8. What does selectively permeable mean?

9. What types of organic molecules make up a cell membrane?

10. What is the function of the cell membrane?

11. What is diffusion?

12. What is meant by equilibrium?

13. What is osmosis?

14. Define the following terms: isotonic solution, hypotonic solution, and hypertonic solution. Explain what would happen to the cell if it is placed in a hypertonic solution.

15. What is active transport?

16. What type of organic molecule is needed for active transport?

17. What is endocytosis and exocytosis?

18. What is the difference between diffusion and active transport?

Chapter 8 & 9: Photosynthesis and Cellular Respiration

1. Define photosynthesis.
2. What is the equation for photosynthesis?
3. Where does photosynthesis occur?
4. What type of organisms carry out photosynthesis?
5. What is the most important energy molecule in organisms?
6. Does respiration require oxygen?
7. What are the two types of fermentation that do not require oxygen? Define them.
8. What type of respiration yields more ATP?
9. What is the equation for cellular respiration?
10. Where does respiration occur in the cell?
11. What type of organisms carry out cellular respiration?

Chapter 10: Cell Division and Growth

1. What is a chromosome?
2. What is mitosis?
3. What is a centromere?
4. Write the following stages of mitosis in order:
Telophase, metaphase, interphase, prophase, anaphase
5. What happens during interphase?

Chapter 11: Fundamentals of Genetics

1. Define the following terms:

Homozygous

Heterozygous

Dominant

Recessive

Genotype

Phenotype

Hybrid

Pure

Allele

2. What is the principle of dominance?
3. What is the principle of segregation?
4. What is the principle of independent assortment?
5. What is probability and how does it apply to genetics?
6. What are genes and where are they located?
7. What is a monohybrid cross? Dihybrid cross?
8. What is codominance? Give an example of a trait that is codominant.
9. What is incomplete dominance? Give an example.
10. What are multiple alleles? Give an example.

