

**Biology Basic
Review Guide
Semester 1 Final Exam**

Chapter 1: Introduction

1. Define the following words and give examples to explain the word.

a. organism

b. cell

c. homeostasis

d. data

e. hypothesis

f. control group

g. independent variable

h. theory

i. biology

j. dependent variable

k. observation

l. experimental group

m. controlled variables

2. List the steps of the scientific method in order.

3. How many variables should scientists test at 1 time?

4. List the levels of organization of multicellular organisms from simplest to complex.

5. What are some requirements of a good hypothesis?

6. Jake decided to make spaghetti one day for lunch. He started to boil the water and decided to put salt in the water for fun. He noticed that the water started to boil instantly and rapidly. Jake wondered if salt affects the boiling rate of water. He believed that salt would increase the rate of boiling water. Jake conducted his experiment one time. He had a pan with water and a pan with water and 2 tablespoons of salt. He made sure the amount of water, type of pan, and the temperature of the stove were kept the same for both situations. Jake found that the pan with salt and the pan without salt took the same time for the water to come to a boil.

Observations:

Problem:

Independent Variable:

Dependent Variable:

Hypothesis:

Controlled Variables:

Did he prove his hypothesis?

7. What variable goes on the x-axis of the graph?

What variable goes on the y-axis of the graph?

What is an appropriate title for a graph?

Chapter 4 and 5: Chemistry

1. List the 4 common elements in living things.

2. Name the 3 parts of an atom. Write the charge and the location of the particle.

3. Given the atomic number and the atomic mass, how do you determine the number of protons, electrons, and neutrons?

4. Calculate the following knowing the atomic number is 12 and the atomic mass is 25.
 - Protons

 - Neutrons

 - Electrons

5. Define the following
 - a. reactant

 - b. product

 - c. water

 - d. covalent bond

 - e. organic molecule

 - f. inorganic molecule

6. Fill in the table for the following biomolecules.

Biomolecule	Function	Building Blocks
Lipids		
Carbohydrates		
Proteins		

7. How do enzymes work?

8. In the following chemical reaction ($\text{H}_2 + \text{O}_2 \rightarrow \text{H}_2\text{O}_2$), what happens to the atoms?

Circle the reactants and put a square around the products.

9. What is the relationship between matter, atoms, and elements?

10. Write the chemical symbol for the elements.

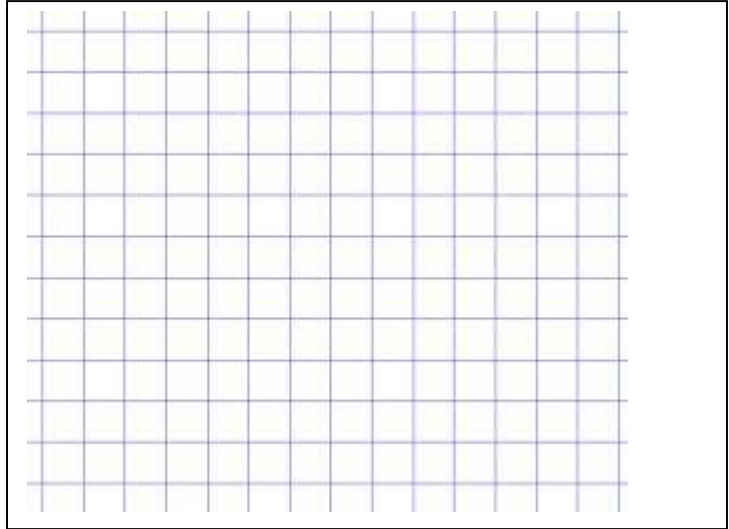
- | | |
|--------------------|--------------------|
| a. Sodium _____ | b. Potassium _____ |
| c. Magnesium _____ | d. Hydrogen _____ |
| e. Oxygen _____ | f. Sulfur _____ |
| i. Nitrogen _____ | j. Neon _____ |

11. Define acid, base, and neutral. Create the pH scale and label where acids, bases, and neutral solutions are located.

12.

Graph the following:

Rate of Activity (Enzyme X)	Rate of Activity (Enzyme Y)	Temp. (°C)
3%	0%	0
20%	12%	10
45%	22%	20
57%	44%	30
65%	56%	40
2%	62%	50
0%	68%	60
0%	70%	70
0%	71%	80
0%	72%	90
0%	0%	100



- Using the graph above, at what temperature does enzyme X and enzyme Y have the same rate of activity?
- What is the optimal temperature for each enzyme?
- Which enzyme is active over the smallest (narrowest) temperature range?

Chapter 6: Cells

1. What is the difference between prokaryotic cells and eukaryotic cells?
2. Give an example of a prokaryotic cell.
3. What is an organelle?
4. What happens to cells when they are placed in the following environments and why:
HYPOTONIC

HYPERTONIC

ISOTONIC

5. Describe the function of the following organelles. Draw a picture of the organelle by your function.

a. Nucleus

b. Mitochondria

c. Golgi

d. Chloroplasts

e. Cell membrane

f. Cell wall

g. Ribosome

h. Cytoplasm

6. Define the following;

a. diffusion

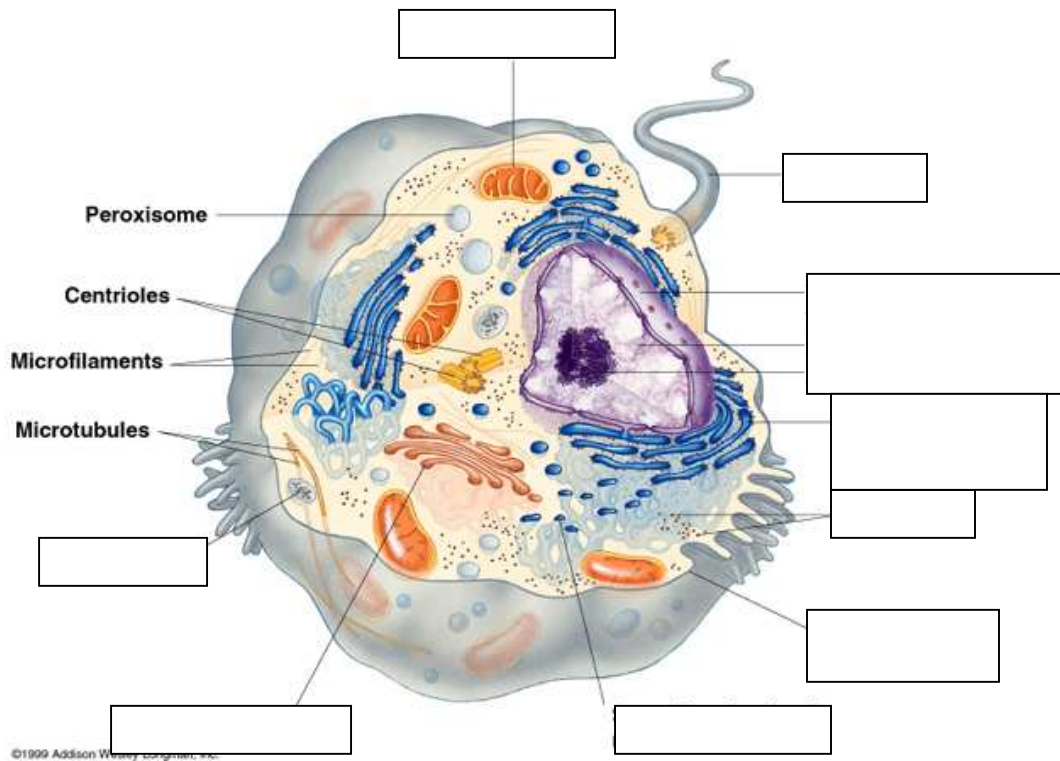
b. passive transport

c. osmosis

d. active transport

e. facilitated diffusion

7. Label the following picture with the correct organelles.



8. Explain 3 differences between plant and animal cells.

Chapter 7 and 8: Cell Respiration and Photosynthesis

1. Write the equation for cell respiration.

2. What are the 3 stages that take place during cell respiration?

3. Define autotroph and heterotroph.

Give an example of an autotroph and heterotroph.

4. What is the relationship between photosynthesis and cell respiration?

Draw a simple picture to show this relationship. There is one in your book.

5. Is cell respiration anaerobic or aerobic? Explain your answer.

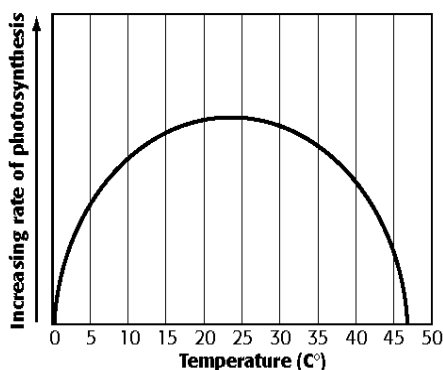
6. What causes muscle fatigue and soreness?

7. Write the equation for photosynthesis.

8. Why are plants green?

9. What would happen to a plant if carbon dioxide were removed?

10.



Graph 2

A. At what temperature is the rate of photosynthesis the greatest?

B. Explain how you came to this conclusion.