

Chapter 1: The Scientific Method (10%)

1. List and describe the steps of the scientific method in order.
2. What are the different types of variables? For the experiment below identify the different variables:
A scientist conducted an experiment to determine the effect of diet on the weight of lab mice. One set of lab mice were fed a special high fat diet for one month, while another set of lab mice were fed a regular diet for one month. All mice were housed in the same size cages, were given the same amounts of food and water, and had similar amounts of exercise.
3. What measurement system is used in science?
4. What are examples of the appropriate units for length and mass?
5. What are the characteristics that all living things have in common? Give an example of each characteristic.

Chapter 2: The Chemistry of Life (10%)

1. Draw an atom.
2. Define the following and list where they are located in an atom: proton, neutron, and electron.
3. Review bonding. What are covalent bonds and ionic bonds?
4. What are the special properties of water? Give an example of each characteristic.
5. What type of bond is found between two water molecules?
6. What makes water polar?
7. Give an example of a chemical reaction and label the products and reactants.
8. What are the four classes of organic macromolecules?
9. List the function and an example of each of the four macromolecules.
10. What is an enzyme? How is the structure of an enzyme related to its function?
11. What happens to an enzyme after it has been involved in a chemical reaction?

Chapter 3: The Cell (20%)

1. State the function of the following organelles: nucleus, Golgi body, ribosome, endoplasmic reticulum, lysosome, cell wall, chloroplast, and mitochondria.
2. What is the structure and function of the cell membrane?
3. Compare and contrast a prokaryote and a eukaryote.
4. Compare and contrast a plant and an animal cell.
5. What are the three parts of cell theory?
6. Who was the first person to identify and see cells?
7. Define the following: hypotonic, hypertonic, isotonic, osmosis, diffusion, active transport, passive transport, endocytosis and exocytosis.
8. What does it mean if a membrane is semi-permeable?
9. Draw three diagrams showing a cell in an isotonic solution, a cell in hypotonic solution and a cell in a hypertonic solution. Draw arrows to show the movement of water for all three diagrams.

Chapters 4: Photosynthesis and Cellular Respiration (20%)

1. What is ATP? What does it do?
2. Review photosynthesis. What is the function of photosynthesis?
3. What is the formula for photosynthesis?
4. What are the reactants (what goes in) and products (what comes out) of both light and dark reactions? Where do the products then go?
5. What are electron carriers? Name the electron carriers involved in photosynthesis and cellular respiration.
6. What is a pigment? Why do leaves of a plant appear green?
7. What is the difference between aerobic and anaerobic respiration?
8. Compare and contrast alcoholic and lactic acid fermentation.
9. Review cellular respiration. What is the function of cellular respiration?
10. What is the formula for cellular respiration?
11. What are the steps (in order) of cellular respiration?

12. What are the reactants (what goes in) and products (what comes out) of cellular respiration? Where do the products then go?
13. How many molecules of ATP are produced in each step of cellular respiration?
14. How many TOTAL ATPs are produced from one molecule of glucose when oxygen is present in cellular respiration?
15. Review the diagrams for photosynthesis and cellular respiration. Be able to label the diagrams.

Chapters 5: Cell Division (20%)

1. What is the purpose of cell division?
2. What are the stages of the cell cycle?
3. What are the stages of mitosis?
4. Define cancer in terms of the cell cycle.

Chapter 8: DNA (20%)

1. How did Griffith's and Avery's experiments contribute to the discovery of DNA?
2. What role did Hersey and Chase have in the identification of DNA as genetic material?
3. What is the unit that makes up the long molecule of DNA? What are the three parts of each unit?
4. State Chargaff's rule.
5. Who was credited for the discovery of DNA's structure?
6. What happens during DNA replication? What is DNA polymerase's role in building a new DNA strand?
7. What are the three types of RNA?
8. Compare transcription versus translation. Use the terms: codon, amino acid, anticodon, DNA, mRNA, nucleus, polymerase, ribosome, RNA and tRNA.
9. What is a mutation? What are the two kinds of mutations?
10. Compare a point and frameshift mutation.
11. List four types of chromosomal mutations.