Life Science

Study Group Module

**Learning Objectives**

Review the following Learning Objectives as an organized beginning to your study of this module. As you read the Learning Objectives, note key words which will aid you in finding the information in the texts. When you complete the module, revisit this list and check for areas that require further investigation.

* Understand the composition of matter.
* Review the concepts of kinetic and potential energy.
* Understand how matter is combined.
* Define types of mixtures.
* Identify the difference between mixtures and compounds.
* Identify types of chemical bonds and chemical reactions.
* Differentiate between organic and inorganic compounds.
* Identify the types of organic compounds found in living tissue and their physiologic activities.
* Identify basic cell structure and function.
* Identify modes of membrane transport.
* Understand the actions and properties of DNA and RNA.
* Identify the stages of cellular duplication and division.
* Understand the organization of cells into tissue.
* Identify basic types of tissue.
* Review Fertility and Conception module
* Review Embryology and Fetal Development module

**Study Sources**

The following texts are recommended for completion of this module. Use them to cross reference and build a more comprehensive understanding.

Using key words from the Learning Objectives, search the index. Read those pages listed, and read the chapter in which they are found. Establish a context for the information so that you understand how other topics are related. In addition, read the chapter headings in the Table of Contents, and flip through each text to familiarize yourself with the content of chapters. As you work through Study Group modules, you will eventually read each text in its entirety.

* Holistic Midwifery, Vol. I, Frye
* Human Anatomy and Physiology, Marieb
* Taber’s Cyclopedic Medical Dictionary

**Related Topics**

* Genetics
* Fertility and Conception
* Embryology and Fetal Development
* Organ Systems Functions
* PAP smears
* Breast Exams
* Hypoxia
* Ketone Acidosis
* Pharmacology for Midwives

Life Science Questions

1. What is matter?
2. What is the difference between kinetic and potential energy?
3. List and briefly define the forms of kinetic and potential energy.
4. Describe what an element is.
5. List the four most common elements found in the human body.
6. How many elements are found in the human body?
7. What is the make up of an atom?
8. Is the nucleus of an atom positively or negatively charged?
9. Does an atom have the same number of protons and electrons?
10. If that is true, does and atom have an overall positive, negative or neutral charge?
11. What makes up the greatest volume within an atom?
12. What three pieces of information give us a complete profile of any element?
13. Where can this information be found?

Describe the following:

atomic number

mass number

atomic weight

isotopes

radioisotopes

1. What is the combination of two or more atoms called?
2. What does O2 indicate?
3. Give an example of a compound molecule.
4. What is a mixture?
5. List and briefly define the three types of mixtures.
6. What is the difference between mixtures and compounds?
7. Name the types of chemical bonds.
8. What is the difference between an electron shell and a valence shell?
9. Describe how an atom with seven electrons in it’s covalent shell might be attracted to an atom with one electron in it’s covalent shell.
10. What kind of ions would be formed if the covalent shell with seven electrons acquired the single electron in the other covalent shell?
11. What are ionic bonds commonly called?
12. Two atoms may share electrons to form a more stable compound or molecule. What are these three bond types?
13. Water beading on your shower curtain is an example of what kind of bond?
14. Define ‘chemical reaction’.
15. Give at least one example of the following chemical reactions:

synthesis

decomposition

exchange

1. Describe ‘organic compounds’.
2. Is water an organic compound?
3. Salts are ionic compounds, also known as electrolytes. What important function do these electrolytes perform in the body?
4. What increases acidity?
5. What corrects an increase in acidity?
6. What does pH measure?
7. If the bases are more abundant than the protons in a solution, what end of the pH spectrum will the solution tend toward?
8. How many more hydrogen ions does it take to increase the acidity one full number value (from 4 to 5, or 6 to 7)?
9. What is the normal pH of blood in the body?
10. Name some compounds that contain carbon but are considered inorganic compounds.
11. List the categories of organic compounds found in living tissue.
12. What are carbohydrates? Describe their elemental content.
13. What are lipids? Describe their elemental content.
14. What is the elemental content of protein?
15. Describe the following forms and give examples of the correlating functions that protein make in living organisms.

peptide bond

alpha helix

beta pleated sheet

tertiary structure

quaternary structure

fibrous proteins

functional proteins

1. Describe protein denaturation.
2. What role does protein denaturation play in hypoxia?
3. Define enzyme.
4. How many nucleotide bases are there?
5. Describe the structural form of DNA.
6. What are the two functions of DNA?
7. What is ATP?
8. What are the three basic parts of a cell?
9. What are organelles and where are they found?
10. Define simple diffusion.
11. What is facilitated diffusion?
12. Describe the process of osmosis.
13. How does active transport move molecules against the concentration gradient?
14. Where is most of the cells’ ATP produced?
15. Which are the only cells in the body that have no nucleus in their mature state?
16. What are the three parts of a nucleus?
17. Do all cells in the body replicate themselves at the same rate?
18. What takes place during the interphase of a cell’s life?
19. Describe how DNA replicates.
20. Name the 2 stages of cell division with a brief explanation of what is occurring in each.
21. The cells of the body make up four basic types of tissue. Name them.
22. Where does connective tissue originate?
23. Name the types of muscle tissue.
24. What type of muscle makes up the uterus?
25. What are the nervous tissue cells called?