

ACADEMIC INSTRUCTIONAL LIBRARY



**Biology
Home Teacher
Program**

BIOLOGY

COURSE OVERVIEW

Biology is intended to expose students to the designs and patterns of living organisms that have been created by God. In preceding years, students should have developed a foundational understanding of life sciences. This biology course will expand upon that knowledge and incorporate more abstract knowledge. The student's understanding should encompass both the micro and macro aspects of life and this biology course includes both. The major concepts covered are taxonomy, the chemical basis of life, cellular structure and function, genetics, microbiology, botany, human anatomy and physiology, and ecological principles.

HOME TEACHER LABS

Labs for the Homeschool Plus program are those contained in the Ignitia Online Curriculum. No expensive equipment is required with only several requiring the purchase of small items or household items to conduct the experiments.

It is always advisable to be familiar with your surroundings and wear protective equipment when conducting any experiment. Never allow yourself to be distracted when completing an experiment.

UNIT 1 - TAXONOMY: KEY TO ORGANIZATION

1. **Course Overview**
2. **The History of Taxonomy**
3. **Quiz 1**

4. **Binomial Nomenclature**
5. **Concept of Species**
6. **Quiz 2**
7. **Plant and Animal Classification**
8. **Activity: Keying Plants** (*Select ten flowers from the list to use in making a dichotomous key. If actual specimens are not available, color pictures or artificial flowers may be substituted, or virtual presentations and descriptions may be used. You may also want to use a microscope, magnifying glass, razor blade, tweezers, or dissecting needles. Flowers choices are: azalea, carnation, chrysanthemum, daisy, four o'clock, gardenia, geranium, hydrangea, iris, lily, marigold, orchid, pansy, peony, petunia, poppy, rose, snapdragon, sweet pea, and tulip. Use your five senses and any of the preceding items to observe the flowers and construct a key. You may want to make more than one key when you discover how interesting scientific observation can be. Did you use ten different kinds of flowers? Were you able to use a two-name system to set up your key? What specific challenges, if any, did you encounter?)*
9. **Activity: Keying Animals** (*Make a list of ten to twenty animals of your area, or of one continent of the earth. If a wildlife reserve or a zoo is not easily accessible, pictures may be used to help you with this activity. From this list, construct a dichotomous key for animals*)
10. **Search For A System**
11. **Quiz 3**
12. **Taxonomy and Origins**
13. **Models of Origin**
14. **Project: Research** (*Write a report on the origin of life. Take a subject of origins or a question you have and write a minimum of 500 words as a research project. Be sure to list all references and resources as part of your bibliography.*)
15. **Quiz 4**

16. **Test**
17. **Alternate Test**
18. **Reference**

UNIT 2 - CHEMISTRY OF LIFE

1. **Molecular Basis of Life**
2. **Quiz 1**
3. **Properties of Compounds**
4. **Covalent Bonding**
5. **Importance of Inorganic Compounds**
6. **Quiz 2**
7. **Chemical Reactions**
8. **Quiz 3**
9. **Organic Compounds**
10. **Carbohydrates**
11. **Lipids**
12. **Nucleic Acids**
13. **Quiz 4**
14. **Enzymes**
15. **Quiz 5**
16. **Test**
17. **Alternate Test**
18. **Reference**

UNIT 3 – CELLS

1. **The Cell-An Introduction**
2. **The Microscope**
3. **Experiment: Introducing the Microscope**
4. **Experiment: Plant, Animal, and Algae Cells**
5. **Quiz 1**
6. **Cell Design**
7. **Cell Membrane Function**
8. **Project: Virtual Lab - Osmosis**
9. **Organelles**
10. **Production of Needed Material**
11. **Quiz 2**
12. **Cells in Organisms**
13. **Quiz 3**
14. **Test**
15. **Alternate Test**
16. **Reference**

UNIT 4 - CELL DIVISION AND REPRODUCTION

1. **Cell Division**
2. **Meiosis**
3. **Stages of Mitosis**
4. **Quiz 1**
5. **Asexual Reproduction**

6. **Plants**
7. **Practical Applications in Plants**
8. **Quiz 2**
9. **Sexual Reproduction**
10. **Fertilization**
11. **Quiz 3**
12. **Sexual Reproduction in Animals**
13. **Metamorphosis**
14. **Quiz 4**
15. **Sexual Reproduction in Plants**
16. **Life Cycles of Ferns and Pines**
17. **Quiz 5**
18. **Test**
19. **Alternate Test**
20. **Reference**

UNIT 5 – GENETICS: GOD’S PLAN OF INHERITANCE

1. **Genetics: God's Plan of Inheritance**
2. **Probabilities**
3. **Experiment: Probability**
4. **Cross Predictions**
5. **Application of Mendelian Genetics**
6. **Quiz 1**
7. **Chromosome Basis of Heredity**

8. **Chromosomes in Meiosis**
9. **Sex Chromosomes**
10. **Quiz 2**
11. **Molecular Genetics**
12. **Experiment: Molecular Genetics**
13. **Quiz 3**
14. **Human Genetics**
15. **Factors Studied**
16. **Inherited Diseases**
17. **Quiz 4**
18. **Test**
19. **Alternate Test**
20. **Reference**

UNIT – 6 MICROBIOLOGY

1. **Microbial Taxonomy**
2. **Fungi**
3. **Quiz 1: Microbial Taxonomy and Fungi**
4. **Animal-like Protists**
5. **Quiz 2: Animal-like Protists**
6. **Plant-like Protists (Algae)**
7. **Experiment: Protozoan Culture**
8. **Fungus-like Protists**
9. **Quiz 3: Plant- and Fungus-like Protists**

10. **Eubacteria**
11. **Activity: Pathogenic Bacteria Report**
12. **Archaea**
13. **Viruses, Prions, and Viroids**
14. **Quiz 4: Eubacteria, Archaea, Viruses, Prions, and Viroids**
15. **Test: Microbiology**
16. **Alternate Test: Microbiology**
17. **Reference**

UNIT 7 – PLANTS: GREEN FACTORIES

1. **How Is a Plant Made?**
2. **Parts of the Plant Cell**
3. **Anatomy and Morphology**
4. **Quiz 1**
5. **How do Plants Grow?**
6. **Developmental Anatomy**
7. **Quiz 2**
8. **How do Plants Work?**
9. **Experiment: Seeds**
10. **Photosynthesis: A Closer Look**
11. **Respiration**
12. **Quiz 3**
13. **How do Plants Help People?**
14. **Quiz 4**

15. **Test**
16. **Alternate Test**
17. **Reference**

UNIT 8 - HUMAN ANATOMY AND PHYSIOLOGY

1. **Digestive System**
2. **Excretory System**
3. **Respiratory System**
4. **Circulatory System**
5. **The Heart**
6. **Experiment: Heart Rate**
7. **Quiz 1**
8. **Body Framework**
9. **Muscular System**
10. **Reproductive System**
11. **Quiz 2**
12. **Environmental Interactions**
13. **Sensory Systems: The Eye**
14. **Sensory Systems: Hearing, Taste, Touch**
15. **Endocrine System**
16. **Immune System and Disease**
17. **Quiz 3**
18. **Test**
19. **Alternate Test**

20. Reference

UNIT 9 - ECOLOGY, POLLUTION, AND ENERGY

1. Principles of Ecology
2. Environmental Factors
3. Food Chains
4. Quiz 1
5. Ecological Relationships
6. Communities and Habitats
7. Experiment: Habitats
8. Experiment: Chose from one of the experiments listed: Biomes, Quadrats, and Inventory.
9. Quiz 2
10. Pollution Affects Ecology
11. Pollution Problems
12. Quiz 3
13. Energy Affects Ecology
14. **Essay: Stewardship** (*Clues to ecological principles are given in numerous passages of the Bible. A Bible study of ecology actually opens the doors to better understanding of God's love and concern for the earth. Use a concordance to locate Bible passages associated with words concerning our stewardship of the earth. You may use a dictionary to find synonyms for these words: dominion, replenish, subdue, judgment, stewardship. Find each of the passages using these words related to principles of ecology. List all passages by quote, book, chapter, and verse under each word. Use your own interpretation to rewrite what you think each verse is saying. Your essay of these words should list at least 10 words and give*

your understanding of how the word is being used in the verse and how it references stewardship responsibilities.)

15. **Quiz 4**
16. **Test**
17. **Alternate Test**
18. **Reference**

UNIT 10 - PRINCIPLES AND APPLICATIONS OF BIOLOGY

1. **Study of Life**
2. **Definition of Life**
3. **Quiz 1**
4. **Basic Principles of Life**
5. **Control System**
6. **Environment of Life**
7. **Quiz 2**
8. **Applications of Biology**
9. **Green Revolution**
10. **Quiz 3**
11. **Test**
12. **Alternate Test**
13. **Reference**