

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.

Students at this level should show development in their ability and understanding of scientific inquiry. The units contain experiments and projects that seek to develop a deeper conceptual meaning for the student and actively engage the student. The continued exposure of science concepts and scientific inquiry will serve to improve the student's skill and understanding.

Biology should be preceded or accompanied by an Algebra I course.

Upon completion of the course, students should be able to do the following:

- Classify different animals using taxonomy.
- Demonstrate a knowledge of molecular structure as it relates to organic compounds.
- Use a microscope to study microscopic organisms.
- Describe cells, their different parts, and the function of a cell.
- Discuss the different parts of a plant.
- Describe and explain the function of each system in the human body.
- Perform Punnett square functions to determine probability of inheritance.
- Differentiate between mitosis and meiosis and between asexual and sexual reproduction.
- Understand the impact man has on the environment.

UNIT 1: TAXONOMY: KEY TO ORGANIZATION				
Assignment Titles				
BIOLOGY	1.	Course Overview	12.	Quiz 3
	2.	The History of Taxonomy	13.	Taxonomy and Origins
	3.	Quiz 1	14.	Models of Origin
	4.	Binomial Nomenclature	15.	Project: Research
	5.	Concept of Species	16.	Project: Origins*
	6.	Quiz 2	17.	Quiz 4
	7.	Plant and Animal Classification	18.	Special Project*
	8.	Experiment: Fruit	19.	Test
	9.	Activity: Keying Plants*	20.	Alternate Test*
	10.	Activity: Keying Animals*	21.	Reference
	11.	Search For A System		

UNIT 2: CHEMISTRY OF LIFE	
Assignment Titles	
BIOLOGY	1. Molecular Basis of Life
	2. Quiz 1
	3. Properties of Compounds
	4. Experiment: Static Electricity
	5. Covalent Bonding
	6. Experiment: Temperature Control*
	7. Importance of Inorganic Compounds
	8. Experiment: Water Properties
	9. Experiment: Indicators*
	10. Quiz 2
	11. Chemical Reactions
	12. Quiz 3
	13. Organic Compounds
14. Carbohydrates	
15. Experiment: Starch*	
16. Lipids	
17. Nucleic Acids	
18. Quiz 4	
19. Enzymes	
20. Experiment: Digestion*	
21. Quiz 5	
22. Special Project*	
23. Test	
24. Alternate Test*	
25. Reference	

UNIT 3: CELLS	
Assignment Titles	
BIOLOGY	1. The Microscope
	2. Experiment: Introducing the Microscope
	3. Experiment: Plant, Animal, and Algae Cells
	4. Experiment: Onion Cells*
	5. Quiz 1
	6. Cell Design
	7. Cell Membrane Function
	8. Experiment: Osmosis
	9. Organelles
	10. The Microscope
11. Production of Needed Material	
12. Quiz 2	
13. Cells in Organisms	
14. Experiment: Tissues*	
15. Quiz 3	
16. Special Project*	
17. Test	
18. Alternate Test*	
19. Reference	

UNIT 4: CELL DIVISION AND REPRODUCTION	
Assignment Titles	
BIOLOGY	1. Cell Division
	2. Meiosis
	3. Stages of Mitosis
	4. Experiment: Mitosis
	5. Quiz 1
	6. Asexual Reproduction
	7. Experiment: Regeneration*
	8. Plants
	9. Experiment: Bulb Structure
	10. Practical Applications in Plants
	11. Experiment: Cuttings*
	12. Quiz 2
	13. Sexual Reproduction
	14. Fertilization
	15. Experiment: Sexual Reproduction*
16. Quiz 3	
17. Sexual Reproduction in Animals	
18. Experiment: Tissue Structure	
19. Metamorphosis	
20. Quiz 4	
21. Sexual Reproduction in Plants	
22. Life Cycles of Ferns and Pines	
23. Experiment: Ferns and Pines*	
24. Experiment: Flowers*	
25. Quiz 5	
26. Special Project*	
27. Test	
28. Alternate Test*	
29. Reference	

UNIT 5: GENETICS: GOD'S PLAN OF INHERITANCE				
Assignment Titles				
BIOLOGY	1.	Genetics: God's Plan of Inheritance	12.	Experiment: Molecular Genetics
	2.	Probabilities	13.	Quiz 3
	3.	Experiment: Probability	14.	Human Genetics
	4.	Cross Predictions	15.	Factors Studied
	5.	Application of Mendelian Genetics	16.	Inherited Diseases
	6.	Quiz 1	17.	Quiz 4
	7.	Chromosome Basis of Heredity	18.	Special Project*
	8.	Chromosomes in Meiosis	19.	Test
	9.	Sex Chromosomes	20.	Alternate Test*
	10.	Quiz 2	21.	Reference
	11.	Molecular Genetics		

UNIT 6: MICROBIOLOGY				
Assignment Titles				
BIOLOGY	1.	Microbial Taxonomy	12.	Eubacteria
	2.	Fungi	13.	Activity: Pathogenic Bacteria Report
	3.	Experiment: Fungus All Around (Part 1)	14.	Archaea
	4.	Experiment: Fungus All Around (Part 2)	15.	Viruses, Prions, and Viroids
	5.	Quiz 1: Microbial Taxonomy and Fungi	16.	Experiment: Algae Observations*
	6.	Animal-like Protists	17.	Quiz 4: Eubacteria, Archaea, Viruses, Prions, and Viroids
	7.	Experiment: Protozoan Culture	18.	Special Project*
	8.	Quiz 2: Animal-like Protists	19.	Test: Microbiology
	9.	Plant-like Protists (Algae)	20.	Alternate Test: Microbiology*
	10.	Fungus-like Protists	21.	Reference
	11.	Quiz 3: Plant- and Fungus-like Protists		

UNIT 7: PLANTS: GREEN FACTORIES				
Assignment Titles				
BIOLOGY	1.	How Is a Plant Made?	11.	Experiment: Terrarium*
	2.	Parts of the Plant Cell	12.	Respiration
	3.	Anatomy and Morphology	13.	Quiz 3
	4.	Quiz 1	14.	How do Plants Help People?
	5.	How do Plants Grow?	15.	Quiz 4
	6.	Experiment: Seeds	16.	Special Project*
	7.	Developmental Anatomy	17.	Test
	8.	Quiz 2	18.	Alternate Test*
	9.	How do Plants Work?	19.	Reference
	10.	Photosynthesis: A Closer Look		

UNIT 8: HUMAN ANATOMY AND PHYSIOLOGY				
Assignment Titles				
BIOLOGY	1.	Digestive System	12.	Quiz 2
	2.	Excretory System	13.	Environmental Interactions
	3.	Respiratory System	14.	Sensory Systems: The Eye
	4.	Circulatory System	15.	Sensory Systems: Hearing, Taste, Touch
	5.	The Heart	16.	Endocrine System
	6.	Experiment: Heart Rate	17.	Immune System and Disease
	7.	Quiz 1	18.	Quiz 3
	8.	Body Framework	19.	Special Project*
	9.	Muscular System	20.	Test
	10.	Experiment: Muscle Types*	21.	Alternate Test*
	11.	Reproductive System	22.	Reference

UNIT 9: ECOLOGY, POLLUTION, AND ENERGY				
Assignment Titles				
BIOLOGY	1.	Principles of Ecology	12.	Pollution Affects Ecology
	2.	Environmental Factors	13.	Pollution Problems
	3.	Food Chains	14.	Quiz 3
	4.	Quiz 1	15.	Energy Affects Ecology
	5.	Ecological Relationships	16.	Essay: Stewardship
	6.	Communities and Habitats	17.	Quiz 4
	7.	Experiment: Habitats	18.	Special Project*
	8.	Experiment: Biomes*	19.	Test
	9.	Experiment: Quadrats*	20.	Alternate Test*
	10.	Experiment: Inventory*	21.	Reference
	11.	Quiz 2		

UNIT 10: PRINCIPLES AND APPLICATIONS OF BIOLOGY				
Assignment Titles				
BIOLOGY	1.	Study of Life	8.	Applications of Biology
	2.	Definition of Life	9.	Green Revolution
	3.	Quiz 1	10.	Quiz 3
	4.	Basic Principles of Life	11.	Special Project*
	5.	Control System	12.	Test
	6.	Environment of Life	13.	Alternate Test*
	7.	Quiz 2	14.	Reference

(*) Indicates alternate assignment