# Life Science

## Unit 1: Life and Science

## 1 Week

## 7.10, 7.11

| Objectives | Methods | Resources | Assessment |
|---|---|---|---|
| The student will:<br>• list and evaluate 3 methods for discerning if a statement is true<br>• differentiate between physical and recorded evidence<br>• define *science*<br>• list 4 Biblical characteristics that support the belief that the Bible is God's Word<br>• list and describe the steps of the scientific method<br>• differentiate between problems solved best by experiment or survey<br>• describe several ways in which the scientific method is subject to error<br>• explain why science is a tool, not a final answer<br>• discuss ways that bias can affect scientific observations | • lecture<br>• discussion<br>• individual reading<br>• completing workbook activities individually and in pairs<br>• class survey to demonstrate scientific method<br>• experiment to demonstrate scientific method<br>• truth discernment activity | • textbook: Bob Jones *Life Science for Christian Schools, 4th* ed., Chapter 1<br>• teacher made assignments for experiment<br>• scientific statement examples for truth discernment activity | • responses on survey activity<br>• responses on experiment activity<br>• responses on truth discernment activity<br>• participation in class discussion<br>• responses to questions from text<br>• responses to questions on workbook activities<br>• teacher made test |

# Life Science

## Unit 2: Characteristics and Classification of Life

## 1.5 Weeks

## 7.1, 7.3, 7.10, 7.11

| Objectives | Methods | Resources | Assessment |
|---|---|---|---|
| The student will:<br>• list the 4 characteristics of all living things<br>• recognize that living things only come from other living things<br>• list and explain the stages of an organism's life span<br>• recognize the cell as the basic unit of life<br>• compare and contrast spiritual and physical life<br>• state the cell theory<br>• describe four functions common to all cells<br>• name and describe the functions of four molecules which are essential to life<br>• express reasons for classifying organisms<br>• list in order the 7 steps of classification<br>• explain the need for, parts of and correct notation of a scientific name<br>• explain the 2 major problems with the modern classification system<br>• give explanations and examples arguing against the evolutionary significance of the modern classification | • lecture<br>• discussion<br>• individual reading<br>• completing workbook activities individually and in pairs<br>• "Is It Alive?" activity<br>• button classification activity<br>• "classify yourself" activity | • textbook: Bob Jones *Life Science for Christian Schools, 4th* ed., Chapter 2<br>• teacher made "Is It Alive?" activity<br>• buttons<br>• pictures of organisms from the 5 Living Kingdoms | • responses on "Is It Alive?" activity<br>• responses on classification activities<br>• participation in class discussion<br>• responses to questions from text<br>• responses to questions on workbook activities<br>• teacher made test |

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| system<br>• distinguish between species and biblical kind<br>• name the 5 Living Kingdoms and give the major characteristics of each<br>• name at least 2 organisms from each kingdom | | | |

# Life Science

## Unit 3: Cellular Structure

## 1 Week

## 7.2, 7.11

| Objectives | Methods | Resources | Assessment |
|---|---|---|---|
| The student will:<br>• describe the structure, composition and properties of cell membranes<br>• describe the processes of osmosis and diffusion<br>• differentiate between passive and active transport<br>• describe the three basic parts of a cell<br>• describe the structure and function of 8 cytoplasmic organelles<br>• discuss the function of a nucleus in a cell<br>• list the two main ways by which organisms obtain energy<br>• list two major organism activities which require energy | • lecture<br>• discussion<br>• individual reading<br>• completing workbook activities individually and in pairs<br>• organelle comic strips | • textbook: Bob Jones *Life Science for Christian Schools, 4th* ed., Chapter 3<br>• cellular molecule models<br>• teacher made assignments for organelle comic strips | • participation in class discussion<br>• responses to questions from text<br>• responses to questions on workbook activities<br>• organelle comic strips<br>• teacher made test |

# Life Science

## Unit 4: Cellular Activities

## 1.5 Weeks

## 7.2

| Objectives | Methods | Resources | Assessment |
|---|---|---|---|
| The student will:<br>• differentiate between tissues and organs<br>• describe the division of labor within cells and multicellular organisms, and relate it to the division of labor within the body of Christ<br>• define and describe the effects of turgor pressure<br>• discuss the process of cellular respiration<br>• differentiate between aerobic and anaerobic cellular respiration<br>• name the reactants and products and give examples of each type of cellular respiration<br>• explain the process of photosynthesis, naming the reactants and products of the process | • lecture<br>• discussion<br>• individual reading<br>• completing workbook activities individually and in pairs<br>• turgor pressure demonstration<br>• alcoholic fermentation experiment | • textbook: Bob Jones *Life Science for Christian Schools, 4th* ed., Chapter 4<br>• lettuce leaves for turgor pressure demonstration<br>• materials for alcoholic fermentation experiment<br>• Bibles | • participation in class discussion<br>• responses to questions from text<br>• responses to questions on workbook activities<br>• teacher made test |

# Life Science

## Unit 5: The Cell Cycle and Protein Synthesis

## 1 Week

## 7.2, 7.7

| Objectives | Methods | Resources | Assessment |
|---|---|---|---|
| The student will:<br>• describe the relationship between genes and chromosomes<br>• describe the process of mitotic cell division<br>• name and describe the four phases of mitosis<br>• explain the dependence of asexual reproduction on mitosis<br>• give examples of several forms of asexual reproduction<br>• describe the basic structure of a DNA molecule<br>• differentiate between transcription and replication | • lecture<br>• discussion<br>• individual reading<br>• completing workbook activities individually, in pairs and as a class<br>• mitosis demonstration | • textbook: Bob Jones *Life Science for Christian Schools, 4th* ed., Chapter 5<br>• paper and string mitotic phases | • participation in class discussion<br>• responses to questions from text<br>• responses to questions on workbook activities<br>• teacher made test |

# Life Science

## Unit 6: Genetics

## 3 Weeks

## 7.4, 7.11

| Objectives | Methods | Resources | Assessment |
|---|---|---|---|
| The student will:<br>• give examples of inherited traits<br>• discuss Gregor Mendel's work with peas<br>• differentiate between purebred and hybrid<br>• differentiate between dominant and recessive<br>• demonstrate the ability to use Punnet squares to determine simple genetic crosses<br>• describe incomplete dominance, multiple gene inheritance, inheritance of sex in humans, and sex linked traits and be able to give examples of each<br>• discuss a biblical position on inherited disorders<br>• define and list several types of mutations<br>• differentiate between somatic and germ mutations, and gene and somatic mutations<br>• differentiate between selective breeding and crossbreeding | • lecture<br>• discussion<br>• individual reading<br>• completing workbook activities individually and in pairs<br>• dominant and recessive traits project<br>• Punnet square activity | • textbook: Bob Jones *Life Science for Christian Schools, 4th* ed., Chapter 6 & 7<br>• teacher made dominant and recessive traits project<br>• teacher made Punnet square activity | • participation in class discussion<br>• responses to questions from text<br>• responses on Punnet square activity<br>• responses to questions on workbook activities<br>• teacher made test<br>• teacher made rubrics for dominant and recessive traits project |

# Life Science

## Unit 7: Creationism and Evolution

## 2 Weeks

## 7.1

| Objectives | Methods | Resources | Assessment |
|---|---|---|---|
| The student will:<br>• contrast Biblical creationism and evolutionism and explain how both views are based on faith<br>• list and describe 7 Biblical teachings concerning Creation<br>• list the sequence of creation as given in Genesis 1<br>• describe the 4 Creation-week theories and give a scriptural basis for each<br>• describe the canopy theory and give a scriptural basis for it<br>• relate the flood theory of fossil formation<br>• define and describe the *young-earth* and *old-earth theories*<br>• discuss the significance of the behemoth and the leviathan described in Job 40-41<br>• differentiate between evolution, the theory of evolution, and biological evolution<br>• describe the theories of inheritance of acquired characteristics, evolution by mutation, natural selection and mutation-selection, | • lecture<br>• discussion<br>• individual reading<br>• completing workbook activities individually and in pairs<br>• group and individual reading of Bible passages<br>• evolutionary essay activity<br>• shake it up activity | • textbook: Bob Jones *Life Science for Christian Schools, 4th* ed., Chapter 8<br>• Bibles<br>• Essays with evolutionary viewpoint<br>• pieces of broken toys | • participation in class discussion<br>• responses to questions from text<br>• responses to questions on workbook activities<br>• teacher made test<br>• responses on essay activity<br>• responses on shake it up activity |

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| and present arguments against each<br>• discuss the purpose of phylogenetic trees and present arguments against them<br>• describe the theory of recapitulation and present arguments against it<br>• explain what is meant by the “fossil record”, describe an evolutionist’s view of fossil formation, and tell what the fossil record does support | | | |

# Life Science

## Unit 8: Kingdoms Archaebacteria, Eubacteria, Protista, Fungi

## 1 Week

## 7.2, 7.7, 7.11

| Objectives | Methods | Resources | Assessment |
|---|---|---|---|
| The student will:<br>• understand the importance and function of bacteria, protists, and fungi in the natural world<br>• explain the characteristics of the organisms in each of the 4 kingdoms (Archaebacteria, Eubacteria, Protista, and Fungi) that cause scientists to place the organisms in those kingdoms<br>• describe several positive and negative effects of bacteria<br>• describe the rapid growth capability of bacteria<br>• distinguish between bacteria and viruses<br>• differentiate between prokaryotic and eukaryotic organisms<br>• differentiate between a colony and a tissue<br>• distinguish between protozoa and algae<br>• describe the ways by which protists obtain energy<br>• describe fragmentation and conjugation<br>• distinguish between saprophytes and parasites as it relates to fungi | • lecture<br>• discussion<br>• individual reading<br>• completing workbook activities individually and in pairs<br>• bacterial multiplication activity | • textbook: Bob Jones *Life Science for Christian Schools, 4th* ed., Chapter 9 | • participation in class discussion<br>• responses to questions from text<br>• responses to questions on workbook activities<br>• teacher made test<br>• responses to questions on bacterial multiplication activity |

# Life Science

## Unit 9: Plant Structure, Function, and Responses

## 1.5 Weeks

## 7.2, 7.5, 7.11

| Objectives | Methods | Resources | Assessment |
|---|---|---|---|
| The student will:<br>• explain the key parts of a technical definition of plants<br>• list and describe the 3 main types of plant organs<br>• compare tap and fibrous root systems<br>• differentiate between woody and herbaceous stems<br>• identify and describe the function of the parts of a leaf<br>• discuss the two main methods of support in plants<br>• describe the structure and function of xylem, phloem, fibers, epidermis, bark, and cork<br>• differentiate between the 3 main groups of plants<br>• differentiate between angiosperms and gymnosperms<br>• discuss the 5 primary functions of plants<br>• describe the structure of a leaf and its role in photosynthesis<br>• describe the effects of hormones on plant function<br>• define and differentiate between 4 types of tropisms | • lecture<br>• discussion<br>• individual reading<br>• completing workbook activities individually and in pairs<br>• begin plant germination and growth project<br>• xylem function demonstration<br>• tropism experiment<br>• video series *The Private Life of Plants* | • textbook: Bob Jones *Life Science for Christian Schools, 4th* ed., Chapter 10<br>• materials for plant germination and growth project, and xylem function demonstration<br>• examples of leaves, root systems, and annual rings<br>• plants for tropism experiment<br>• video series *The Private Life of Plants* | • Fuparticipation in class discussion<br>• responses to questions from text<br>• responses to questions on workbook activities<br>• teacher made test |

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| • discuss photoperiodism and its effects on plant life cycles | | | |

# Life Science

## Unit 10: Plant Classification and Reproduction

## 2 Weeks

## 7.2, 7.5, 7.7, 7.10, 7.11

| Objectives | Methods | Resources | Assessment |
|---|---|---|---|
| The student will:<br>• classify plants into their respective groups based on current taxonomic guidelines<br>• identify and describe the structure and function of each part of a flower<br>• differentiate between pollination and fertilization<br>• describe the processes of pollination and fertilization<br>• explain the various methods of pollination<br>• list 3 ways a plant may reproduce asexually<br>• list and explain several methods by which plants disperse seeds | • lecture<br>• discussion<br>• individual reading<br>• completing workbook activities individually and in pairs<br>• asexual reproduction experiment<br>• complete seed germination project begun in unit 10<br>• video series *The Private Lives of Plants*<br>• flower dissection | • textbook: Bob Jones *Life Science for Christian Schools, 4th* ed., Chapter 11<br>• plant cuttings for asexual reproduction experiment<br>• video series *The Private Lives of Plants*<br>• flowers and teacher made worksheets for flower dissection<br>• enlarged cross-section of a flower | • participation in class discussion<br>• responses to questions from text<br>• responses to questions on workbook activities<br>• teacher made test<br>• responses on seed germination project<br>• responses on teacher made worksheets for flower dissection |

# Life Science

## Unit 11: The Invertebrates

## 2 Weeks

## 7.3, 7.6, 7.11

| Objectives | Methods | Resources | Assessment |
|---|---|---|---|
| The student will:<br>• explain the key parts of the definition of an animal<br>• state the distinguishing characteristic of an invertebrate<br>• explain the function of pores in filter feeding of sponges<br>• describe the structure and movement of a jellyfish<br>• describe the function of nematocysts in cnidarians<br>• describe the formation of coral reefs<br>• define radial and bilateral symmetry<br>• differentiate between free living and parasitic worms<br>• describe structure and function of the nervous, digestive, and excretory systems of planarians and earthworms<br>• list at least 3 nematodes<br>• describe the structure and movement of earthworms<br>• describe structure and function of the circulatory and respiratory systems of earthworms<br>• explain the | • lecture<br>• discussion<br>• individual reading<br>• completing workbook activities individually and in pairs<br>• hydrostatic skeleton demonstration<br>• insect study | • textbook: Bob Jones *Life Science for Christian Schools, 4th* ed., Chapter 12<br>• pictures of various invertebrates<br>• posters<br>• tube of toothpaste (hydrostatic skeleton demonstration)<br>• insects and magnifying glasses for insect study | • participation in class discussion<br>• responses to questions from text<br>• responses to questions on workbook activities<br>• responses to questions on insect study<br>• teacher made test |

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| significance of earthworms to soil<br>• describe the morphology and movement of gastropods<br>• describe the morphology and feeding of bivalves<br>• discuss the processes of circulation, respiration and excretion in insects<br>• differentiate between open and closed circulatory systems<br>• describe molting and its significance to arthropods<br>• differentiate between complete and incomplete metamorphosis and describe the stages of each<br>• compare advantages and disadvantages of exoskeletons<br>• describe the morphology and movement of gastropods | | | |

# Life Science

## Unit 12: The Cold-Blooded Vertebrates (Fish, Reptiles, and Amphibians)

## 2 Weeks

## 7.3, 7.6, 7.11

| Objectives | Methods | Resources | Assessment |
|---|---|---|---|
| The student will:<br>• differentiate between bone and cartilage<br>• define vertebral column and skull and explain their significance in vertebrates<br>• compare and contrast oxygenated and deoxygenated blood<br>• describe circulation in animals with 2, 3, or 4 chambered hearts and give an example of an animal with each<br>• compare respiration with gills and lungs<br>• differentiate between central and peripheral nervous systems and cranial and spinal nerves<br>• distinguish between sensory receptors and sense organs<br>• describe the structures of a vertebrate digestive system and their functions<br>• describe the structures of a vertebrate excretory system and their functions<br>• describe fish characteristics which make it suitable for living in water | • lecture<br>• discussion<br>• individual reading<br>• completing workbook activities individually and in pairs<br>• frog model dissection<br>• preserved frog dissection | • textbook: Bob Jones *Life Science for Christian Schools, 4th* ed., Chapter 13<br>• pictures of various reptiles, amphibians and fish<br>• frog models<br>• preserved frogs<br>• dissection equipment<br>• posters<br>• examples of bone and cartilage | • participation in class discussion<br>• responses to questions from text<br>• responses to questions on workbook activities<br>• teacher made test<br>• responses on frog dissection |

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| • identify the characteristics of each of the 3 fish groups and give examples from each<br>• describe the metamorphosis of a frog<br>• describe the eating habits of frogs<br>• identify major vertebrate body systems through the dissection of a frog<br>• differentiate between tailed and tailless amphibians and give examples of each<br>• describe the characteristics and habitats of each of the 4 groups of reptiles | | | |

# Life Science

## Unit 13: The Warm-Blooded Vertebrates (Birds and Mammals)

## 1 Week

## 7.3, 7.6, 7.11

| Objectives | Methods | Resources | Assessment |
|---|---|---|---|
| The student will:<br>• differentiate between warm and cold blooded<br>• give examples of ways that animals regulate their body temperature<br>• explain how the structure of a bird's bones suit it for flight<br>• explain why flight muscles require large amounts of energy and oxygen<br>• describe how birds care for their eggs<br>• describe the structure of feathers and differentiate between the different types of feathers<br>• give hair and mammary glands as the key characteristics of mammals<br>• discuss the 3 ways mammals bear young<br>• name and describe the 2 monotremes<br>• name and describe several marsupials<br>• describe the characteristics of hair and fur | • lecture<br>• discussion<br>• individual reading<br>• completing workbook activities individually and in pairs<br>• feather observation activity<br>• bird/mammal report | • textbook: Bob Jones *Life Science for Christian Schools, 4th* ed., Chapter 14<br>• feathers and magnifying lenses<br>• bird and mammal bones<br>• posters | • participation in class discussion<br>• responses to questions from text<br>• responses to questions on workbook activities<br>• teacher made test<br>• bird/mammal report<br>• responses on feather observation activity |

# Life Science

## Unit 14: Animal Behavior

## 1 Week

## 7.6, 7.9, 7.11

| Objectives | Methods | Resources | Assessment |
|---|---|---|---|
| The student will:<br>• differentiate between the 3 levels of animal behavior and give examples of each<br>• describe and give examples of each of the 2 types of innate behavior<br>• explain the function of pheromones in animal behavior<br>• define intelligence | • lecture<br>• discussion<br>• individual reading<br>• completing workbook activities individually and in pairs<br>• show examples of behaviors using live animals<br>• "Which Behavior?" activity | • textbook: Bob Jones *Life Science for Christian Schools, 4th* ed., Chapter 15<br>• small animals such as fish and class pet | • participation in class discussion<br>• responses to questions from text<br>• responses to questions on workbook activities<br>• teacher made test<br>• responses on "Which Behavior?" activity |

# Life Science

## Unit 15: Relationships within Ecosystems and Organisms

## 1.5 Weeks

## 7.8, 7.9, 7.11

| Objectives | Methods | Resources | Assessment |
|---|---|---|---|
| The student will:<br>• Define ecology and state the 3 relationships studied by ecologists<br>• describe the main components of an ecosystem<br>• describe the 3 major physical environment factors affecting ecosystems<br>• describe the water cycle<br>• explain the steps of succession<br>• explain the roles of producer and consumer organisms<br>• describe the effects of limiting factors<br>• explain the importance of rhythms in an ecosystem<br>• explain dormancy and hibernation and their importance in seasonal rhythms<br>• identify examples of inter-species relationships<br>• discuss energy exchange between organisms<br>• complete the connections in a food web<br>• categorize animals according to their feeding habits and | • lecture<br>• discussion<br>• individual reading<br>• completing workbook activities individually and in pairs<br>• artificial ecosystem activity<br>• backyard ecosystem activity<br>• video<br>• completing biome outline | • textbook: Bob Jones *Life Science for Christian Schools, 4th* ed., Chapter 16 and 17<br>• aquarium for artificial ecosystem activity<br>• posters<br>• video: "Understanding Ecosystems"<br>• teacher made biome outline | • participation in class discussion<br>• responses to questions from text<br>• responses to questions on workbook activities<br>• teacher made test<br>• responses on ecosystem activities |

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| explain the significance of each in an ecosystem<br>• define and give examples of each of the types of relationships within a population<br>• define and give examples of competition, mutualism, commensalism, camouflage, warning coloration, and mimicry<br>• list and describe 8 terrestrial and 2 aquatic biomes<br>• discuss how animal behaviors and relationships and the physical environment show God's design, not accident | | | |

# Life Science

## Unit 16: Man's Relationship with the Environment

## 1.5 Weeks

## 7.8, 7.9, 7.11

| Objectives | Methods | Resources | Assessment |
|---|---|---|---|
| The student will:<br>• list and define several natural resources<br>• relate God's promise to supply our needs even though resources are limited<br>• give a Scriptural position for man's use of natural resources<br>• differentiate between renewable and nonrenewable resources<br>• explain man's dependence on producer, consumer and decomposer organisms<br>• discuss problems associated with man's use of wildlife<br>• define farming and domesticated organism<br>• explain the factors affecting population growth<br>• discuss doomsday ecology in light of population growth and God's Word<br>• define conservation and list several resources that may need to be conserved<br>• differentiate between different types of pollutants<br>• describe water pollution and sewage | • lecture<br>• discussion<br>• individual reading<br>• completing workbook activities individually and in pairs<br>• stewardship project<br>• trash solution discussion activity | • textbook: Bob Jones *Life Science for Christian Schools, 4th* ed., Chapter 18 | • participation in class discussion<br>• responses to questions from text<br>• responses to questions on workbook activities<br>• teacher made test<br>• stewardship project<br>• responses to trash solution discussion activity |

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| treatment<br>• list several common components of air pollution<br>• discuss the problems associated with trash disposal and recycling | | | |