

# Biology

**Time on Task:** 3.5 hours per week

## Course Philosophy

Science reflects the magnificent order and complexity of God’s creation. It presents God as the great Designer, Sustainer, and Lawgiver. Students will continually be called on to see the divine wisdom of creation and its implications for other subjects. The student’s mind will be challenged to understand the universe and refute the man-made idea of evolution. Science is presented to show how man is created in God’s image in order to fulfill the Genesis command to subdue the earth and exercise the privilege to rule over it (Genesis 1:28a)

## Course Description

In Biology, students conduct field and laboratory investigations, use scientific methods during investigations, and make informed decisions using critical-thinking and scientific problem-solving. Students in Biology study a variety of topics that include: structures and functions of cells and viruses; growth and development of organisms; cells, tissues, and organs; nucleic acids and genetics; biological evolution; taxonomy; metabolism and energy transfers in living organisms; living systems; homeostasis; ecosystems; and plants and the environment.

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| <p><b>Goals and Objectives</b><br/> <b>Texas Essential Knowledge and Skills (TEKS)</b></p> <p><b>§112.43. Biology.</b></p> <p><b>(a) General requirements.</b><br/>         Students shall be awarded one credit for successful completion of this course.<br/>         Prerequisites: none. This course is recommended for students in Grades 9, 10, or 11.</p> <p><b>(b) Introduction.</b><br/>         (1) In Biology, students conduct field and laboratory investigations, use scientific methods during investigations, and make informed decisions using critical-thinking and scientific problem-solving. Students in Biology study a variety of topics that include: structures and functions of cells and viruses; growth and development of organisms; cells, tissues, and organs; nucleic acids and genetics; biological evolution; taxonomy; metabolism and energy transfers in living organisms; living systems; homeostasis; ecosystems; and plants and the environment.</p> | <p><b>Scope and Sequence</b><br/> <u><b>Biology – A Search for Order and Complexity</b></u><br/> <b>Unit 1-Science: Finding Order in Complexity</b><br/> <i>Chapter 1: The Scientist and His Methods</i></p> <ul style="list-style-type: none"> <li>• Work of the Scientist</li> <li>• Goals of the Scientist</li> <li>• Specialization of the Scientist</li> </ul> <p><i>Chapter 2: Application of Scientific Methods to the Insect World</i></p> <ul style="list-style-type: none"> <li>• Knowledge of Insects</li> <li>• Management of Insects</li> <li>• Description of Common Insects</li> </ul> <p><b>Unit 2-Chemical Perspectives in Biology</b><br/> <i>Chapter 3: Basic Chemical</i></p> | <p><b>Spiritual Goals</b><br/> <b>God’s intended purpose for science:</b></p> <ol style="list-style-type: none"> <li>1. To learn that God looks at the intent of the heart rather than outward beauty. (I Samuel 16:7)</li> <li>2. To learn that God’s glory is evident in all of nature. (Psalm 19:1)</li> <li>3. To learn that God created the world. (Genesis 1:16)</li> <li>4. To learn that all wisdom is found in God. (Proverbs 3:19)</li> <li>5. To understand that our knowledge of the origin of life comes from God alone. God tells us that we can know of origins only by believing what He says. (Hebrews 11:3)</li> <li>6. To know that no person was present or had any knowledge of His work at the beginning. (Job 38:4, 21)</li> <li>7. To understand that all living things have their origin in God. (Genesis</li> </ol> |
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| <p>(2) Science is a way of learning about the natural world. Students should know how science has built a vast body of changing and increasing knowledge described by physical, mathematical, and conceptual models, and also should know that science may not answer all questions.</p> <p>(3) A system is a collection of cycles, structures, and processes that interact. Students should understand a whole in terms of its components and how these components relate to each other and to the whole. All systems have basic properties that can be described in terms of space, time, energy, and matter. Change and constancy occur in systems and can be observed and measured as patterns. These patterns help to predict what will happen next and can change over time.</p> <p>(4) Investigations are used to learn about the natural world. Students should understand that certain types of questions can be answered by investigations, and that methods, models, and conclusions built from these investigations change as new observations are made. Models of objects and events are tools for understanding the natural world and can show how systems work. They have limitations and based on new discoveries are constantly being modified to more closely reflect the natural world.</p> | <p><i>Principles</i></p> <ul style="list-style-type: none"> <li>• Inside the Atom</li> <li>• Molecular Structure</li> <li>• Inorganic and Organic Chemistry</li> </ul> <p><i>Chapter 4: Chemical Structure of biological Materials</i></p> <ul style="list-style-type: none"> <li>• Carbohydrates and Lipids</li> <li>• Proteins and Nucleic Acids</li> </ul> <p><i>Chapter 5: chemical Transformations of biological Materials</i></p> <p>Metabolism<br/>Enzymes and Energy</p> <p><b>Unit 3-The Continuity of Life</b></p> <p><i>Chapter 6: The Nature of Living Things</i></p> <ul style="list-style-type: none"> <li>• More Than Chemistry</li> <li>• Cells</li> <li>• Law of Biogenesis</li> </ul> <p><i>Chapter 7: The Science of Genetics</i></p> <ul style="list-style-type: none"> <li>• Heredity</li> <li>• Applied Genetics</li> <li>• The Chemical Basis of Gene Action</li> <li>• Population Genetics</li> <li>• Genetics and the Species</li> </ul> <p><i>Chapter 8: The Development of the Individual</i></p> <ul style="list-style-type: none"> <li>• Growth of the Embryo</li> <li>• Experimental Embryology</li> </ul> | <p>1:11-13, 20-27, 31)</p> <ol style="list-style-type: none"> <li>To understand that God cares about all living things. (Matthew 6:26, 28-30)</li> <li>To understand that God controls the ecological system. He can make things grow or not grow, be sturdy or diseased. (Psalm 65:9-13)</li> <li>To understand that God is the beginning of life on earth. Organisms were first created as mature, complete, and perfect. (Genesis 1:27, 28; 2:19, 20, 23, 24)</li> <li>To know that plants, animals, and man were each created with specific purposes. (Psalm 104:14, 15)</li> </ol> <p><b>Biblical Integration Truth Statements</b></p> <ol style="list-style-type: none"> <li><b><i>What is prime reality, the really real?</i></b><br/>God exists and is the ultimate reality. (Psalm 90:2, Revelation 22:13)       <ol style="list-style-type: none"> <li>God designed, created, and sustains His creation. (Genesis 1:1-31)</li> <li>God is good, holy, and loving. (Luke 18:19, 1 John 4:16, 1 Peter 1:16, Psalm 145:12)</li> <li>God is omniscient – all knowing. (Romans 11:33-36, Psalm 147:5)</li> <li>God is sovereign – nothing is beyond His ultimate interest, control, and authority. (Daniel 4:25)</li> <li>God is personal and also triune- He is coequally and coeternally</li> </ol> </li> </ol> |
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|  | <p><b>Unit 4-The World of Living Things</b><br/> <i>Chapter 9: Classification of Organisms</i></p> <ul style="list-style-type: none"> <li>• Development of Classification</li> <li>• The System of Classification</li> <li>• Uncertainties in Classification</li> </ul> <p><b>Unit 5-Small Plants and Little Animals</b><br/> <i>Chapter 10: Kingdom Fungi: Non-green Plants</i></p> <ul style="list-style-type: none"> <li>• Classification of Fungi</li> <li>• The Molds</li> <li>• Other Fungi</li> <li>• Benefits from Fungi</li> </ul> <p><i>Chapter 11: Viruses, Bacteria, and Other Forms</i></p> <ul style="list-style-type: none"> <li>• Viruses</li> <li>• Bacteria</li> <li>• Other Forms of Microorganisms</li> <li>• Control of Microorganisms</li> </ul> <p><i>Chapter 12: Algae</i></p> <ul style="list-style-type: none"> <li>• Classification of Algae</li> <li>• Chlorophyta: Green Algae</li> <li>• Chrysophyta: Algae in Shells</li> <li>• Phaeophyta: Brown Algae and Rhodophyta: Red Algae</li> <li>• Dinoflagellates</li> <li>• Importance of Algae</li> </ul> <p><i>Chapter 13: One-Celled</i></p> | <p>God the Father, God the Son, Jesus, and God the Holy Spirit. (Hebrews 1:3)</p> <p><b>2. <i>What is the nature of external reality, that is, the world around us?</i></b></p> <ol style="list-style-type: none"> <li>a. God is the source of everything and created the universe out of nothing. (Genesis 1:1)</li> <li>b. The universe was created by God to be orderly. (Isaiah 45:18, Psalm 147:4)</li> <li>c. God is constantly involved in the unfolding pattern of the ongoing operation of the universe. (Psalm 24:1-2, Psalm 32:13-15)</li> <li>d. The universe reflects His glory. (Psalm 8:1, Psalm 19:1)</li> </ol> <p><b>3. <i>What is a human being?</i></b></p> <ol style="list-style-type: none"> <li>a. God created humans to know Him intimately and to have a loving relationship with Him. (Psalm 100:3)</li> <li>b. Human beings are created in the image of God with the capacity to choose. (Genesis 1:27, Proverbs 8:10)</li> <li>c. Adam and Eve chose disobedience and brought death to themselves and sin entered the world. (Romans 5:12)</li> <li>d. All human beings have a choice and all have chosen sin that brings separation from God. (Romans 3:23)</li> <li>e. Sin is rebellion against God's wishes and ways and this destroys our relationship with</li> </ol> |
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|  | <p><i>Organisms: The Protozoa</i></p> <ul style="list-style-type: none"> <li>• Description of Protozoa</li> <li>• Importance of Protozoa</li> <li>• Malaria and Quinine</li> </ul> <p><b>Unit 6-Animal Life</b></p> <p><i>Chapter 14: Animals Without Backbones</i></p> <ul style="list-style-type: none"> <li>• Arthropoda</li> <li>• Annelida</li> <li>• Platyhelminthes</li> <li>• Nematoda or Nemata</li> <li>• Mollusca</li> <li>• Coelenterata</li> <li>• Echinodermata</li> <li>• Peripatus</li> </ul> <p><i>Chapter 15: Animals with Backbones</i></p> <ul style="list-style-type: none"> <li>• Mammals</li> <li>• Birds</li> <li>• Reptiles</li> <li>• Amphibians</li> <li>• Fishes</li> </ul> <p><b>Unit 7-The biology of Man</b></p> <p><i>Chapter 16: Form and Major Functions of the Human Body</i></p> <ul style="list-style-type: none"> <li>• Skeletal System</li> <li>• Muscular System</li> <li>• Circulatory System</li> <li>• Respiratory System</li> <li>• Digestive System</li> <li>• Excretory System</li> <li>• Integumentary System</li> </ul> <p><i>Chapter 17: Body Controls and Human Reproduction</i></p> <ul style="list-style-type: none"> <li>• Nervous System</li> <li>• Endocrine System</li> <li>• Vascular Plants without</li> </ul> | <p>God. (Romans 8:7-8)</p> <p>f. God provides a way back to Himself through the death of His son Jesus (the second person of the Trinity), on the cross. (John 3:16, Romans 6:23)</p> <p>g. Human beings must respond to God with repentance of our sins, receiving forgiveness, and accepting Jesus as our Savior. (Romans 10:9-10)</p> <p><b>4. <i>What happens to a person at death?</i></b></p> <p>a. For each person death is either the gate to life with God and His people or the gate to eternal separation from God. (1 Corinthians 50:52)</p> <p>b. After death, your soul will continue to exist in an eternal way and there is a final judgment by God. (Revelation 20:12)</p> <p>c. Everyone chooses to honor and love Him by accepting Jesus as our Lord and Savior or makes a choice to reject Jesus and grasp for self-fulfillment and personal glory. (Romans 6:23)</p> <p>d. Those who received Jesus as Savior will spend eternity in Heaven with God. (Philippians 4:10-21)</p> <p>e. Those who rejected Jesus as Savior will spend eternity in Hell without God. (Hebrews 10:26-27)</p> <p><b>5. <i>Why is it possible to know anything at all?</i></b></p> <p>a. Human beings can both know the</p> |
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|  | <p>Seeds</p> <ul style="list-style-type: none"> <li>• Seed Plants</li> </ul> <p><b>Unit 9-Theories of Biological Change</b></p> <p><i>Chapter 21: Weaknesses of Geologic Evidence</i></p> <ul style="list-style-type: none"> <li>• Inception of Evolutionary Theory</li> <li>• Lack of Fossil Evidence to Support Evolution</li> <li>• Methods of Fossil Dating Inconclusive</li> <li>• Alternate Interpretation of the Fossil Record</li> </ul> <p><i>Chapter 22: Evidences from Similarities</i></p> <ul style="list-style-type: none"> <li>• Structural Similarities</li> <li>• Developmental Similarities</li> <li>• Biochemical Similarities</li> <li>• Misapplication of Similarities</li> </ul> <p><i>Chapter 23: Early Man</i></p> <ul style="list-style-type: none"> <li>• Classification and Uniqueness of Man</li> <li>• Search and Discovery of “Early” Man</li> </ul> <p><i>Chapter 24: Problems for Evolutionists</i></p> <ul style="list-style-type: none"> <li>• Mechanism and Evolution</li> <li>• Origin and Evolution</li> <li>• Transition and Evolution</li> </ul> <p><i>Chapter 25: Limited Variation Versus Unlimited</i></p> | <p>world around them and God Himself because God has built within them the capacity to do so and because He takes an active role in communicating with them. (John 16:13)</p> <ol style="list-style-type: none"> <li>God’s own intelligence is the basis of human intelligence. Knowledge is possible because there is something to be known (God and His creation) and someone to know (God and human beings made in His image). (Genesis 1:27)</li> <li>God reveals, Himself to us in two basic ways: by general revelation and by special revelation. (Exodus 3:2, Psalm 19:1-4)</li> <li>In general revelation, God speaks through the creation of the universe and through His word, the Bible. (2 Samuel 22:31, Psalm 19:1)       <ul style="list-style-type: none"> <li>➤ The Bible is internally consistent and unified in its principles and claims.</li> <li>➤ There is tremendous coherence across the many authors and centuries during which the various books were written and in which its stories unfold.</li> <li>➤ It is relevant to all the cultures of the world</li> </ul> </li> <li>Special revelation is God revealing Himself through supernatural ways.</li> </ol> |
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|  | <p><i>Change</i></p> <ul style="list-style-type: none"> <li>• Genetic Variations</li> <li>• Natural Selection and Complexity</li> <li>• Conclusions for Unit 9</li> </ul> <p><b>Unit 10-Ecology and Conservation</b></p> <p><i>Chapter 26: Interrelationships of Living Things</i></p> <ul style="list-style-type: none"> <li>• Understanding God’s Creation</li> <li>• Symbiosis</li> <li>• Physical Factors in Environment</li> </ul> <p><i>Chapter 27: Balance of Nature</i></p> <ul style="list-style-type: none"> <li>• Soil</li> <li>• Cycles</li> </ul> <p><i>Chapter 28: Biogeography</i></p> <ul style="list-style-type: none"> <li>• Distribution of Organisms</li> <li>• Biomes</li> <li>• Ecological Succession</li> </ul> <p><i>Chapter 29: Conservation: Applied Ecology</i></p> <ul style="list-style-type: none"> <li>• Development of Conservation</li> <li>• Solving Problems in Conservation</li> <li>• Planning for Conservation</li> </ul> <p><i>Epilogue</i></p> <ul style="list-style-type: none"> <li>• The True Goal and Effect of Scientific Study</li> </ul> | <p>Jesus Christ is the ultimate special revelation. He showed us what God is like more fully than any other form of revelation can. Because Jesus was also completely human, he spoke more clearly to us than any other form of revelation can. (John 14:7)</p> <p>6. <b><i>How do we know what is right and wrong?</i></b></p> <ol style="list-style-type: none"> <li>Ethics or the knowledge of right and wrong is based on the character of God as good (holy and loving). (Psalm 33:4)</li> <li>There is an absolute standard by which all moral judgments are measured and God Himself – His character of goodness (holiness and love) – is the standard. (1 Samuel 2:3)</li> <li>As a result of sin, morally, we have become less able to discern good and evil and less able to know God as He truly is. (Proverbs 1:7)</li> <li>God has revealed His standard in the various laws and principles expressed in the Bible. (Psalm 111:10) <ul style="list-style-type: none"> <li>➤ He has dictated absolute moral truth to us.</li> <li>➤ Every truth must conform to Biblical principles.</li> <li>➤ Every choice must reflect God’s moral truth.</li> <li>➤ We must promote, defend, and teach these truths to</li> </ul> </li> </ol> |
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| <p><b>(c) Knowledge and skills.</b></p> <p><b>(1) Scientific processes.</b> The student, for at least 40% of instructional time, conducts field and laboratory investigations using safe, environmentally appropriate, and ethical practices.<br/><i>The student is expected to:</i></p> <p>(A) demonstrate safe practices during field and laboratory investigations; and</p> | <p><b><u>Biology – The Dynamics of Life</u></b></p> <p><b>Unit 1:</b> What is Biology<br/> <b>Unit 2:</b> Ecology<br/> <b>Unit 3:</b> The Life of a Cell<br/> <b>Unit 4:</b> Genetics<br/> <b>Unit 5:</b> Change through Time<br/> <b>Unit 6:</b> Viruses, Bacteria, Protists, and Fungi<br/> <b>Unit 7:</b> Plants<br/> <b>Unit 8:</b> Invertebrates<br/> <b>Unit 9:</b> Vertebrates<br/> <b>Unit 10:</b> The Human Body</p> <p><b>Correlation with TEKS</b></p> <p><b><u>Biology – A Search for Order and Complexity</u></b><br/> (Search)<br/> Christian Liberty Press<br/> Student ISBN<br/> 978-1-930367-92-0<br/> Teacher ISBN<br/> 978-1-930367-92-0</p> <p><b><u>Biology – The Dynamics of Life</u></b> (Dynamics)<br/> Glencoe Science – McGraw Hill<br/> Teacher ISBN<br/> 0-07-829903-9</p> <p>Lab and Experiments in all Chapters</p> <p>(Search) Chapters 1-29<br/> (Dynamics) Chapters 1-39</p> | <p>others.</p> <p>7. <b><i>What is the meaning of human history?</i></b></p> <p>a. History is a meaningful sequence of events leading to the fulfillment of God’s purposes for humanity. (Psalm 22:27-28, Psalm 47:3)</p> <p>b. History is going somewhere, directed toward a known end. (Matthew 25:34)</p> <p>c. History is a form of revelation, not only does God reveal Himself in history, but the very sequence of events is revelation. (Psalm 33:13-14, Psalm 47:9)</p> <p>d. History has meaning because God is behind all events, not only sustaining all things by His powerful word but also in all things working for the good of those who love Him. (Psalm 40:5, Romans 8:28)</p> <p><b><i>What should our response be to God? What were we made for?</i></b></p> <p><b>We were made to</b><br/> <b>Love</b> – Matthew 22:37,<br/> <b>Worship</b> – Romans 12:1,<br/> <b>Obey</b> – 2 John 6, and<br/> <b>Give Glory</b> – Psalm 96:3.</p> |
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| <p>(B) make wise choices in the use and conservation of resources and the disposal or recycling of materials.</p> <p><b>(2) Scientific processes.</b> The student uses scientific methods during field and laboratory investigations.<br/> <i>The student is expected to:</i></p> <p>(A) plan and implement investigative procedures including asking questions, formulating testable hypotheses, and selecting equipment and technology;</p> <p>(B) collect data and make measurements with precision;</p> <p>(C) organize, analyze, evaluate, make inferences, and predict trends from data; and</p> <p>(D) communicate valid conclusions.</p> <p><b>(3) Scientific processes.</b> The student uses critical thinking and scientific problem solving to make informed decisions.<br/> <i>The student is expected to:</i></p> <p>(A) analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information;</p> <p>(B) evaluate promotional claims that relate to biological issues such as product labeling and advertisements;</p> <p>(C) evaluate the impact of research on scientific thought, society, and the environment;</p> <p>(D) describe the connection between biology and future careers;</p> <p>(E) evaluate models according to their adequacy in representing biological objects or events; and</p> <p>(F) research and describe the history of biology and contributions of scientists.</p> | <p>(Search) Chapters 1-29<br/> (Dynamics) Chapters 1-39</p> <p>(Search) Chapters 1-29<br/> (Dynamics) Chapters 1-39</p> <p>(Search) Chapters 1-29<br/> (Dynamics) Chapters 1-39</p> <p>(Search) Chapters 1-29<br/> (Dynamics) Chapters 1-39</p> <p>(Search) Chapter 1<br/> (Dynamics) Chapters 1, 2, 3, 5, 7, 10, 14, 15, 17, 22, 26</p> <p>(Search) Chapters 1, 2<br/> (Dynamics) Chapters 1, 2, 24, 35, 36</p> <p>(Search) Chapters 1, 2<br/> (Dynamics) 1, 2, 5, 7, 8, 10, 11, 13, 17, 32, 33</p> <p>(Search) Chapters 1, 2<br/> (Dynamics) Chapters 1, 2, 5, 6, 9, 10, 11, 13, 14, 17, 18, 24, 25, 27, 31, 32, 36, 37, 38</p> <p>(Search) Chapters 1, 2<br/> (Dynamics) Chapters 2, 5, 6, 8, 20, 22, 24, 27, 35, 36</p> <p>(Search) Chapter 1<br/> (Dynamics) Chapters 1, 5, 7, 8, 9, 10, 13, 14, 15, 17, 18, 39</p> |  |
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| <p><b>(4) Science concepts.</b> The student knows that cells are the basic structures of all living things and have specialized parts that perform specific functions, and that viruses are different from cells and have different properties and functions.<br/> <i>The student is expected to:</i></p> <p>(A) identify the parts of prokaryotic and eukaryotic cells;</p> <p>(B) investigate and identify cellular processes including homeostasis, permeability, energy production, transportation of molecules, disposal of wastes, function of cellular parts, and synthesis of new molecules;</p> <p>(C) compare the structures and functions of viruses to cells and describe the role of viruses in causing diseases and conditions such as acquired immune deficiency syndrome, common colds, smallpox, influenza, and warts; and</p> <p>(D) identify and describe the role of bacteria in maintaining health such as in digestion and in causing diseases such as in streptococcus infections and diphtheria.</p> <p><b>(5) Science concepts.</b> The student knows how an organism grows and how specialized cells, tissues, and organs develop.<br/> <i>The student is expected to:</i></p> <p>(A) compare cells from different parts of plants and animals including roots, stems, leaves, epithelia, muscles, and bones to show specialization of structure and function;</p> <p>(B) identify cell differentiation in the development of organisms; and</p> <p>(C) sequence the levels of organization in multicellular organisms to relate the parts to each other and to the whole.</p> <p><b>(6) Science concepts.</b> The student knows the structures and functions of nucleic acids in the mechanisms of genetics.<br/> <i>The student is expected to:</i></p> <p>(A) describe components of deoxyribonucleic acid (DNA),</p> | <p>(Search) Chapters 6, 11<br/> (Dynamics) Chapters 3, 7, 8, 9, 10, 11, 12, 18, 19, 23</p> <p>(Search) Chapters 6, 11<br/> (Dynamics) Chapters 1, 2, 3, 6, 7, 8, 9, 10, 11, 18, 19, 20, 23, 26, 31, 32</p> <p>(Search) Chapters 6, 11<br/> (Dynamics) Chapters 4, 18, 19, 39</p> <p>(Search) Chapters 6, 11<br/> (Dynamics) Chapters 3, 17, 18, 32, 35, 39</p> <p>(Search) Chapters 6, 11, 12, 14, 15, 16, 18, 19, 20<br/> (Dynamics) Chapters 7, 21, 23, 24, 26, 34</p> <p>(Search) Chapters 6, 11, 12, 14, 15, 16, 18, 19, 20<br/> (Dynamics) Chapters 1, 7, 8, 23, 24, 26, 34</p> <p>(Search) Chapters 6, 11, 12, 14, 15, 16, 18, 19, 20<br/> (Dynamics) Chapters 8, 23, 25</p> <p>(Search) Chapters 7, 8</p> |  |
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| <p>and illustrate how information for specifying the traits of an organism is carried in the DNA;</p> <p>(B) explain replication, transcription, and translation using models of DNA and ribonucleic acid (RNA);</p> <p>(C) identify and illustrate how changes in DNA cause mutations and evaluate the significance of these changes;</p> <p>(D) compare genetic variations observed in plants and animals;</p> <p>(E) compare the processes of mitosis and meiosis and their significance to sexual and asexual reproduction; and</p> <p>(F) identify and analyze karyotypes.</p> <p><b>(7) Science concepts.</b> The student knows the theory of biological evolution.<br/><i>The student is expected to:</i></p> <p>(A) identify evidence of change in species using fossils, DNA sequences, anatomical similarities, physiological similarities, and embryology; and</p> <p>(B) illustrate the results of natural selection in speciation, diversity, phylogeny, adaptation, behavior, and extinction.</p> <p><b>(8) Science concepts.</b> The student knows applications of taxonomy and can identify its limitations.<br/><i>The student is expected to:</i></p> <p>(A) collect and classify organisms at several taxonomic levels such as species, phylum, and kingdom using dichotomous keys;</p> <p>(B) analyze relationships among organisms and develop a model of a hierarchical classification system based on similarities and differences using taxonomic nomenclature; and</p> | <p>(Dynamics) Chapters 1, 6, 7, 8, 11, 12, 13, 15, 29</p> <p>(Search) Chapters 7, 8</p> <p>(Dynamics) Chapter 11</p> <p>(Search) Chapter 7,</p> <p>(Dynamics) Chapters 8, 11, 12, 13, 15</p> <p>(Search) Chapters 7, 8</p> <p>(Dynamics) Chapters 5, 10, 11, 12, 15, 17, 22</p> <p>(Search) Chapter 7</p> <p>(Dynamics) Chapters 11, 19, 20, 24, 38, 10</p> <p>(Search) Chapter 7</p> <p>(Dynamics) Chapters 10, 12</p><br><p>(Search) Chapters 1, 21, 22, 23, 24, 25</p> <p>(Dynamics) Chapters 11, 13, 14, 15, 16, 17, 19, 21, 22, 25, 26, 27, 28, 29, 30, 31, 32</p> <p>(Search) Chapters 1, 21, 22, 23, 24, 25</p> <p>(Dynamics) Chapters 3, 5, 12, 15, 16, 17, 28, 32, 33</p><br><p>(Search) Chapters 9, 10, 11, 12, 13, 14, 15, 16, 18, 20</p> <p>(Dynamics) Chapters 17, 23, 27, 29</p> <p>(Search) Chapters 9, 10, 11, 12, 13, 14, 15, 16, 18, 20</p> <p>(Dynamics) Chapters 2, 3, 4, 16, 17, 18, 19, 20, 21, 24, 27,</p> |  |
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| <p>(C) identify characteristics of kingdoms including monerans, protists, fungi, plants, and animals.</p> <p><b>(9) Science concepts.</b> The student knows metabolic processes and energy transfers that occur in living organisms.<br/><i>The student is expected to:</i></p> <p>(A) compare the structures and functions of different types of biomolecules such as carbohydrates, lipids, proteins, and nucleic acids;</p> <p>(B) compare the energy flow in photosynthesis to the energy flow in cellular respiration;</p> <p>(C) investigate and identify the effects of enzymes on food molecules; and</p> <p>(D) analyze the flow of matter and energy through different tropic levels and between organisms and the physical environment.</p> <p><b>(10) Science concepts.</b> The student knows that, at all levels of nature, living systems are found within other living systems, each with its own boundary and limits.<br/><i>The student is expected to:</i></p> <p>(A) interpret the functions of systems in organisms including circulatory, digestive, nervous, endocrine, reproductive, integumentary, skeletal, respiratory, muscular, excretory, and immune;</p> <p>(B) compare the interrelationships of organ systems to each other and to the body as a whole; and</p> <p>(C) analyze and identify characteristics of plant systems and subsystems.</p> | <p>28, 29, 32<br/>(Search) Chapters 9, 10, 11, 12, 13, 14, 15, 16, 18, 20<br/>(Dynamics) Chapters 17, 18, 19, 20, 21, 22, 24, 25, 26, 32</p> <p>(Search) Chapters 4, 5, 26, 27, 28, 29<br/>(Dynamics) Chapters 6, 8, 9, 11, 12, 19, 20, 36, 35<br/>(Search) Chapters 4, 5, 26, 27, 28, 29<br/>(Dynamics) Chapters 9, 19, 20<br/>(Search) Chapters 4, 5, 26, 27, 28, 29<br/>(Dynamics) Chapters 6, 19, 20, 29, 35<br/>(Search) Chapters 4, 5, 26, 27, 28, 29<br/>(Dynamics) Chapters 1, 2, 3, 4, 5, 9, 22, 27</p> <p>(Search) Chapters 16, 17<br/>(Dynamics) Chapters 6, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 34, 35, 36, 37, 38<br/>(Search) Chapters 16, 17<br/>(Dynamics) Chapters 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 34, 35, 36, 37, 38, 39<br/>(Search) Chapters 18, 19, 20<br/>(Dynamics) Chapters 21, 23</p> |  |
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| <p><b>(11) Science concepts.</b> The student knows that organisms maintain homeostasis.<br/>The student is expected to:</p> <ul style="list-style-type: none"> <li>(A) identify and describe the relationships between internal feedback mechanisms in the maintenance of homeostasis;</li> <li>(B) investigate and identify how organisms, including humans, respond to external stimuli;</li> <li>(C) analyze the importance of nutrition, environmental conditions, and physical exercise on health; and</li> <li>(D) summarize the role of microorganisms in maintaining and disrupting equilibrium including diseases in plants and animals and decay in an ecosystem.</li> </ul> <p><b>(12) Science concepts.</b> The student knows that interdependence and interactions occur within an ecosystem.<br/><i>The student is expected to:</i></p> <ul style="list-style-type: none"> <li>(A) analyze the flow of energy through various cycles including the carbon, oxygen, nitrogen, and water cycles;</li> <li>(B) interpret interactions among organisms exhibiting predation, parasitism, commensalism, and mutualism;</li> <li>(C) compare variations, tolerances, and adaptations of plants and animals in different biomes;</li> <li>(D) identify and illustrate that long-term survival of species is dependent on a resource base that may be limited; and</li> <li>(E) investigate and explain the interactions in an ecosystem including food chains, food webs, and food pyramids.</li> </ul> <p><b>(13) Science concepts.</b> The student knows the significance of plants in the environment.</p> | <p>(Search) Chapter 17<br/>(Dynamics) Chapters 1, 7, 32, 34, 35, 37, 38</p> <p>(Search) Chapters 16, 17<br/>(Dynamics) Chapters 1, 2, 3, 4, 12, 18, 19, 20, 23, 24, 25, 26, 28, 29, 33, 34, 36</p> <p>(Search) Chapters 16, 17<br/>(Dynamics) Chapters 5, 8, 11, 19, 28, 30, 34, 35, 38</p> <p>(Search) Chapters 11, 16, 17, 18, 19, 20, 26, 28<br/>(Dynamics) Chapters 2, 3, 5, 18, 19, 20, 26, 39</p> <p>(Search) Chapter 27<br/>(Dynamics) Chapters 1, 2, 3, 5, 19</p> <p>(Search) Chapters 2, 26<br/>(Dynamics) Chapters 1, 2, 3, 4, 5, 18, 19, 20, 25, 26, 27, 28, 29, 30</p> <p>(Search) Chapters 2, 28<br/>(Dynamics) Chapters 1, 2, 3, 12, 16, 21, 27, 28, 29, 32</p> <p>(Search) Chapter 19<br/>(Dynamics) Chapters 2, 3, 4, 5, 22</p> <p>(Search) Chapter 2<br/>(Dynamics) Chapters 2, 3, 4, 5, 19, 20, 27</p> |  |
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| <p><i>The student is expected to:</i></p> <p>(A) evaluate the significance of structural and physiological adaptations of plants to their environments; and</p> <p>(B) survey and identify methods of reproduction, growth, and development of various types of plants.</p> | <p>(Search) Chapters 2, 6, 12, 18, 19, 20<br/> (Dynamics) Chapters 1, 2, 3, 5, 21, 22, 23, 24<br/> (Search) Chapters 2, 6, 12, 18, 19, 20<br/> (Dynamics) Chapters 10, 21, 22, 23, 24</p> <p><b>Student Activities</b><br/> Games<br/> Books<br/> Role Play<br/> Projects<br/> Journal</p> <p><b>Teaching Strategies</b><br/> Oral Instruction<br/> Demonstration<br/> Visual Aids<br/> Hands-on Activities<br/> Games<br/> Cooperative Learning<br/> Small Groups<br/> Guided Inquiry<br/> Open-ended Questions<br/> Debate<br/> Lecture<br/> Guest Speakers</p> <p><b>Evaluation Procedures</b><br/> Class Participation<br/> Demonstrations<br/> Oral Quizzes</p> <p><b>Other Resources and</b></p> |  |
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|  | <b>Bibliography</b> |  |
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