Biology, 4th Edition

Lesson Plan Overview

| Day(s) | Topic | Pages | Support Materials | Bible Integration\* |
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| Chapter 1: The Science of Life and the God of Life | | | | |
| 1–2 | 1.1 What Is Truth? | 2–8 |  | Relationship between God and science  Redemption of the world  God and Creation  Deductive reasoning and worldviews  God and syllogisms  God’s Word as Truth |
| 1.2 What Is Science? | 8–10 |  | Dominion through modeling |
| 3 | 1.3 Using the Scientific Method | 10–15 |  |  |
| 1.4 The Limits of Science | 15–17 |  |  |
| 4 | 1.5 Science and the Christian | 17–20 |  | Christian philosophy of science  Divinely ordained destruction in conquering the Promised Land  Proper view of worship |
| 1.6 The Attributes of Life | 20–23 |  |  |
| 5 |  |  | Lab 1a The Scientific Method |  |
| 6 | 1.7 The Study of Life | 23–30 | Physical and spiritual life |
| 7 |  |
| 8 |  |  | Lab 1b The Microscope |  |
| 9 | Chapter 1 Review | | | |
| 10 | Chapter 1 Test | | | |
| Chapter 2: The Chemistry of Life | | | | |
| 11–13 | 2.1 Matter | 31–36 |  |  |
| 2.2 Energy | 36–40 |  | Sustaining power of God in nature |
| 2.3 Solutions | 41–45 |  |
| 2.4 Organic Compounds | 45–47 |  | God’s role both in creating and sustaining life |
| 14 |  |  | Lab 2 Osmosis |  |
| 15–16 | 2.5 Carbohydrates and Lipids | 47–50 |  |  |
| 2.6 Proteins and Nucleic Acids | 50–54 |  |  |
| Chapter 2 Review | | | |
| 17 | Chapter 2 Test | | | |
| Chapter 3: Introduction to Cells Cytology Part I | | | | |
| 18–19 | 3.1 Cell Theory | 55–58 |  | God’s power revealed through His creation |
| 3.2 Levels of Cellular Organization | 59–60 |  |  |
| 3.3 Cellular Anatomy | 60–70 |  | Creation and the law of conservation |
| 20 | 3.4 Homeostasis | 70–73 |  | Evidence of design in creation |
| 3.5 Transportation Across the Membrane | 74–76 |  |  |
| 21 |  |  | Lab 3a Basic Cytology  Lab 3b Cellular Organelles and Processes |  |
| 22 | Chapter 3 Review | | | |
| 23 | Chapter 3 Test | | | |
| Chapter 4: Cellular Processes Cytology Part II | | | | |
| 24–25 | 4.1 Energy Relationships | 77–80 |  | Evidence of God’s design at the molecular level |
| 4.2 Photosynthesis | 80–85 | Lab 4 Photosynthesis | Creation vs. evolution in studying photosynthesis |
| 26 | 4.3 Cellular Respiration | 85–91 |  |  |
| 27 | 4.4 Protein Synthesis | 91–97 |  | Creator’s design of the “code of life”  Evidence of design in mitochondrial DNA |
| 28 | 4.5 Metabolism and Homeostasis | 97–100 |  |  |
| Chapter 4 Review | | | |
| 29 | Chapter 4 Test | | | |
| Chapter 5: Genetics The Continuity of Life Part I | | | | |
| 30–31 | 5.1 The Mechanism of Heredity | 101–5 |  | Genetics and environment as excuses for sin by secularists  Influence of man’s spiritual nature in his development  Jesus’s power to save from sin |
| 5.2 Cell Division | 105–8 |  |  |
| 5.3 Meiosis | 108–12 |  |  |
| 32 |  |  | Lab 5a Mitosis and Meiosis |  |
| 33 | 5.4 Mendelian Genetics | 112–17 | Lab 5b, Genetics Parts I–II\*\* |  |
| 34 | 5.5 Variations of Mendelian Genetics | 117–22 | Lab 5b, Genetics Parts III–V\*\* |  |
| 35 | 5.6 Sex Determination and Sex-Linked Traits | 123–26 | Lab 5b, Genetics Part VI\*\* |  |
| 36 | Chapter 5 Review | | | |
| 37 | Chapter 5 Test | | | |
| Chapter 6: Advanced Genetics The Continuity of Life Part II | | | | |
| 38 | 6.1 Changes Affecting the Numbers of Chromosomes | 128–33 | Lab 6 Genetic Research\*\* | Stewardship in agriculture |
| 6.2 Mutations | 133–37 |  |
| 39 | 6.3 Gene Expression | 137–42 | God’s wisdom and power seen through the development of an embryo  Suffering as evidence of man’s sin and God’s grace |
| 40 | 6.4 The Gene Pool | 142–46 |  |
| 41 | 6.5 Eugenics | 146–51 | Importance of understanding biblical principles as they apply to scientific issues  Influence of man’s spiritual nature on his behavior  Christians and surrogacy  Christians’ use of genetic technologies  Ethical and moral issues surrounding artificial reproduction  The Bible as the source of values  Man’s suffering because of sin  Man’s need of salvation  Sanctity of human life |
| If assigned, have students present Lab 6 research. | | | |
| 42 | Chapter 6 Test | | | |
| Chapter 7: Biotechnology | | | | |
| 43 | 7.1 Clones and Cloning | 152–56 |  | Sanctity of human life  Biblical response to human cloning |
| 44 | 7.2 Genetic Engineering | 156–58 |  |  |
| 7.3 Stem Cell Technology | 158–61 |  | Evaluating stem cell research in light of the Bible  Using scientific discoveries to glorify God and help others |
| 45 | 7.4 Gene Therapy | 161–62 |  |  |
| 7.5 DNA Fingerprints | 163–65 |  |  |
| 7.6 Genetically Modified Plants | 165–67 |  | Stewardship of God-given resources |
| 46 |  |  | Lab 7a DNA Extraction |  |
|  |  | Lab 7b DNA Analysis\*\* |  |
| 47 | Chapter 7 Test | | | |
| Chapter 8: The History of Life | | | | |
| 48 | 8.1 What Is a Worldview? | 168–70 |  | Importance of presuppositions to a worldview |
| 8.2 Which Worldview Should We Use? | 170–74 |  | Christian worldview vs. secular worldview  Authority of Scripture  Results of believing evolutionary theory  Stewardship  Declaring God’s glory  Spreading the gospel  Showing love for others  Need for faith in Christ  Creationist presuppositions vs. evolutionist presuppositions |
| 49 | 8.3 The Beginnings of Evolutionary Theory | 174–76 | Lab 8 Creationism: My Beliefs and Their Defense\*\* | Creation with apparent age  God’s Word vs. man’s wisdom |
| 8.4 Darwin’s Theory of Evolution | 176–80 | Biblical response to environmental determinism  Special creation of man  God’s glory in creation |
| 50 | 8.5 Later Developments in Evolutionary Theory | 180–88 | Role of the Flood in fossil formation  God’s design and efficiency in creation |
| 51 | 8.6 Interpretation of Genesis | 189–93 | Inerrancy of Scripture  Response to nonliteral interpretations of Creation  Genesis account of Creation  Importance of and support for a literal interpretation of Scripture  Authority of Scripture  Relevance of the literal Creation account to the Christian faith  Intelligent design and biblical Creationism  Scripture as the ultimate, unchanging standard |
| 52 | 8.7 Noah’s Flood and Fossilization | 193–99 | Genesis account of the Flood  Noah’s ark  Scripture passages comparing the antediluvian and postdiluvian earth  Support for a universal Flood  God’s covenant with Noah  Noah’s Flood as an explanation for fossilization |
| 53 | Chapter 8 Review | | | |
| 54 | Chapter 8 Test | | | |
| Chapter 9: The Classification of Organisms | | | | |
| 55 | 9.1 The Classification Hierarchy | 202–9 |  | God’s design in creation |
| 9.2 Scientific Names | 209–12 |  |  |
| 56 | 9.3 The Species | 212–16 |  | God’s design in creation  Creationist view of speciation |
| 9.4 The Biblical Kind | 217–20 |  | Noah’s Flood and the biblical kind  God’s design in creation  Importance of evaluating things based on Scripture |
| 57 |  |  | Lab 9 The Use of Biological Keys |  |
| 58 | Chapter 9 Review | | | |
| 59 | Chapter 9 Test | | | |
| Chapter 10: Bacteria and Viruses | | | | |
| 60–61 | 10.1 Bacterial Classification and Morphology | 221–26 |  | Evidence of detail in God’s creation |
| 10.2 Bacterial Reproduction and Growth | 226–32 |  | Creationism and accelerated mutation rates  God’s design in creation |
| 10.3 Virology | 232–35 |  |  |
| 62 |  |  | Lab 10a Bacterial Basics  Lab 10b Bacteria and Antibiotics or Lab 10c Epidemic Alert |  |
| 63 | 10.3 Virology (cont’d) | 235–38 |  | Evolutionary bias in the search for the “first living thing” |
| 10.4 Viral Diseases | 238–40 |  |  |
| 64–65 | 10.5 Infectious Disease | 240–45 |  | Disease as a result of the Fall and Curse  Disease as a means of grace  Christ’s miracles of healing  Helping those who suffer from disease  Leprosy in Bible times  Disease and God’s providence |
| 10.6 Defense Against Infectious Disease | 245–50 |  | The body’s defenses against disease as evidence of God’s loving care for His creation and as evidence against evolution |
| 10.7 Disorders | 250–54 |  | Biblical perspective on aging and death  Future glorified body and eternal life for believers  God’s power over life and death  Christ’s victory over physical and spiritual death |
| 66 | Chapter 10 Review | | | |
| 67 | Chapter 10 Test | | | |
| Chapter 11: The Kingdom Protista | | | | |
| 68–69 | 11.1 General Characteristics (of Protozoans) | 255–56 |  | Creation of protozoans |
| 11.2 Protozoan Classification | 257–63 |  |  |
| 11.3 General Characteristics (of Algae) | 263–66 |  |  |
| 70 | 11.4 Algal Classification | 266–72 |  | The first plague of Egypt and a biblical response to a modernist interpretation of Scripture |
| 11.5 The Water Molds | 272–73 |  |  |
| 11.6 The Slime Molds | 273–74 |  |  |
| 71–73 |  | | Lab 11 Protista |  |
| 74 | Chapter 11 Review | | | |
| 75 | Chapter 11 Test | | | |
| Chapter 12: The Kingdom Fungi | | | | |
| 76 | 12.A Fungi and Man | 275–79 |  | Leavening in the Bible |
| 12.B Characteristics of Fungi | 279–81 |  |  |
| 77 | 12.C Classification of Fungi | 281–86 |  |  |
| 78 |  |  | Lab 12 Fungi and Lichens |  |
| 79 | Chapter 12 Test | | | |
| Chapter 13: The Plant Kingdom Botany Part I | | | | |
| 80 | 13.1 Nonvascular Plants | 287–91 |  | God’s care of His creation |
| 81 | 13.2 Vascular Plants Without Seeds | 291–93 |  |  |
| 13.3 Vascular Plants with Seeds | 294–98 |  | The cedar of Lebanon and Solomon’s temple  Biblical response to the evolutionary interpretation of the age of trees |
| 82 |  |  | Lab 13a Plant Identification |  |
| 83 | 13.4 Plant Tissues | 298–300 |  |  |
| 13.5 The Leaf | 300–304 |  |  |
| 84 | 13.6 The Root | 304–7 |  |  |
| 13.7 The Stem | 307–13 |  |  |
| 85 |  |  | Lab 13b Plant Organs |  |
| 86 | Chapter 13 Test | | | |
| Chapter 14: The Life Processes of Plants Botany Part II | | | | |
| 87 | 14.1 Plants and Water | 314–19 |  | God’s design of plants  A plant’s needing water for physical growth as an analogy for a Christian’s needing God’s Word for spiritual growth |
| 14.2 Plants and Minerals | 319–22 |  |  |
| 88 | 14.3 Plant Hormones | 322–26 |  |  |
| 14.4 Plants and Light | 326–28 |  |  |
| 89 | 14.5 Vegetative Reproduction | 328–31 |  | Grafting in the Bible |
| 14.6 Sexual Reproduction | 332–39 |  |  |
| 90 |  |  | Lab 14 Flowers, Fruits, and Seeds |  |
| 91 | Chapter 14 Review | | | |
| 92 | Chapter 14 Test | | | |
| Chapter 15: The Invertebrates Zoology Part I | | | | |
| 93 | 15.1 Characteristics of the Kingdom Animalia | 340–42 |  | Adam’s naming of the animals  Man’s dominion over animals  The Fall’s effect on animals |
| 15.2 Animal Anatomy and Classification | 342–44 |  |  |
| 94 | 15.3 Phylum Porifera: The Sponges | 345–47 |  |  |
| 15.4 Phylum Cnidaria | 347–51 |  | Stewardship |
| 95 |  |  | Lab 15a Porifera  Lab 15b Cnidaria |  |
| 96 | 15.5 Phylum Platyhelminthes: The Flatworms | 351–57 |  | Jewish dietary laws and trichinosis |
| 15.6 Phylum Nematoda: The Roundworms | 357–59 |  | Worms in the Bible |
| 97 | 15.7 Phylum Annelida: The Segmented Worms | 359–62 |  |  |
| 98 | 15.8 Phylum Mollusca | 362–66 | Lab 15c Worms I: Platyhelminthes and Nematoda  Lab 15d Worms II: Annelida |  |
| 15.9 Phylum Echinodermata | 366–68 | Unique design in echinoderms as evidence for creation |
| 99 | Chapter 15 Review | |  |
| 100 | Chapter 15 Test | | | |
| Chapter 16: The Arthropods Zoology Part II | | | | |
| 101 | 16.1 Characteristics of Arthropods | 369–71 |  |  |
| 16.2 Subphylum Crustacea | 371–73 |  |  |
| 102 |  |  | Lab 16a Crustaceans |  |
| 103 | 16.3 Subphylum Chelicerata | 374–76 |  |  |
| 16.4 Characteristics of Insects | 377–83 |  | God’s design and care of His creation |
| 104 | 16.5 Major Orders of Insects | 384–90 |  | Insects as a plague recorded in Exodus  Stewardship |
| 105 |  |  | Lab 16b The Grasshopper  Lab 16c Insect Orders |  |
| 106 | Chapter 16 Review | | | |
| 107 | Chapter 16 Test | | | |
| Chapter 17: The Ectothermic Vertebrates Zoology Part III | | | | |
| 108 | 17.1 The Chordates | 391–93 |  |  |
| 109 | 17.2 Vertebrate Form and Function | 394–96 |  | Carnivores a result of the Fall  God’s glory and design seen in creation |
| 17.3 Vertebrate Behavior | 396–98 |  | Animal intelligence and God’s design  Humans created in the image of God |
| 110 | 17.4 Class Osteichthyes | 398–405 |  | The fish as a symbol of Christianity  Fish in the Bible |
| 111 | 17.5 Classes Agnatha and Chondrichthyes | 406–8 |  |  |
| 17.6 Introduction to Amphibians | 409–13 |  | Frogs as a plague recorded in Exodus |
| 112 | 17.7 Structure and Function in the Frog | 413–17 |  |  |
| 113 |  |  | Lab 17a Live Bony Fish  Lab 17b Dissection of a Bony Fish |  |
| 114 | 17.8 Characteristics of Reptiles | 417–20 | God’s design and use of reptiles  Reptiles as a symbol of God’s power and redemption  Amniotic egg as evidence of design  Dinosaurs in the Bible |
| 115 | 17.9 Classification of Living Reptiles | 420–26 |  | Satan’s (the serpent’s) temptation of Eve  The Fall, the resulting Curse, and the promise of a Redeemer  Two groups of people—the people of God and the enemies of God  Christ’s certain victory over Satan |
| 116 | Chapter 17 Review | | | |
| 117 | Chapter 17 Test | | | |
| Chapter 18: The Endothermic Vertebrates Zoology Part IV | | | | |
| 118 | 18.1 Bird Characteristics | 427–31 |  | The bird’s body as evidence of God’s design  Archaeopteryx as an example of creation and not evolution  The ostrich in the Bible |
| 119 | 18.2 Bird Systems | 431–34 |  | Bird bills as evidence of God’s design  Role of birds in the Battle of Armageddon |
| 120 | 18.3 Bird Family Life | 434–38 | Lab 18a Birds | Birds in the Bible  Christ’s comparison of a hen’s care for her brood to His care for the Israelites |
| 121 | 18.4 Characteristics of Mammals | 439–45 |  |  |
| 122–123 | 18.5 Classification of Placental Mammals | 445–52 | Lab 18b Mammals | Rodents in the Bible  Biblical references to lions  Man a special creation of God  Mammals and Jewish dietary laws in the Bible  Man’s dominion over animals  God’s preservation of His creation  Noah’s faith in and gratitude toward God |
| 124 | Chapter 18 Test | | | |
| Chapter 19: Ecology | | | | |
| 125–126 | 19.1 The Nature of Ecology | 453–55 | Lab 19 Succession and Pollution (will continue for several weeks) | Stewardship |
| 19.2 The Ecosystem Defined | 455–66 | Reference to the water cycle in the Bible |
| 127–128 | 19.3 Interactions in the Biosphere | 466–71 | The Bible and extraterrestrial life |
| 19.4 Changes in the Biosphere | 471–74 |  |
| 129 | 19.5 Man’s Ecological Niche | 474–80 | Biblical response to deep ecology  Need for balance in man’s stewardship of the earth  God’s care and provision for His creation  The Bible and animal rights  Biblical response to the New Age movement and pantheism  The Bible and vegetarianism |
| 130 | 19.6 Pollution | 480–85 | A biblical look at global warming  God’s future destruction of the earth  God’s judgments described in Revelation  Man’s responsibility to be good stewards of God’s creation |
| 131 | Chapter 19 Test | | | |
| Chapter 20: Introduction to Human Anatomy and Physiology | | | | |
| 132 | 20.1 In the Image of God | 488–91 | Lab 20a Readings on the Human Body Systems (will continue throughout Chapters 20–25)\* | Human intelligence: evidence against the evolutionary idea that man is merely a highly intelligent animal  Biblical perspective on animals and spirits  The meaning of man’s being created in God’s image  The image of God in man marred by the Fall  Sanctification of believers  God as the source of all truth and moral authority  Man as a spiritual being  Man’s sinful nature and need of salvation  God’s provision of salvation through Jesus Christ |
| 20.2 Human Tissues, Organs, and Systems | 492–95 |  |
| 133 | 20.3 The Skin | 496–98 |  |  |
| 20.4 Hair and Nails | 498 |  |  |
| 20.5 Skin Glands | 498–500 |  | The Bible and human races |
| 134 | 20.6 Bone Anatomy and Physiology | 500–504 |  |  |
| 20.7 Joints | 505–7 |  |  |
| 135 |  |  | Lab 20b The Human Body and the Skeletal System |  |
| 136 | 20.8 Muscle Anatomy | 507–9 |  |  |
| 20.9 Muscle Physiology | 510–11 |  | Importance of caring for the body to enable better service for the Lord |
| 20.10 Muscles and Body Movements | 511–15 |  |  |
| 137 |  |  | Lab 20c The Human Muscular and Integumentary Systems |  |
| Chapter 20 Review | | | |
| 138 | Chapter 20 Test | | | |
| Chapter 21: Incoming Substances | | | | |
| 139–140 | 21.1 Anatomy of the Respiratory System | 516–19 |  |  |
| 21.2 Respiration | 519–22 |  |  |
| 21.3 Control of Breathing | 522–25 |  | Scriptural objections to smoking |
| 141 |  |  | Lab 21a The Human Respiratory System |  |
| 142 | 21.4 Organs of the Digestive System | 525–31 |  | Teleology—all that God creates has a purpose |
| 21.5 Foods and Digestion | 531–38 |  | Scriptural warning against gluttony |
| 143 |  |  | Lab 21b The Human Digestive System\* |  |
| Chapter 21 Review | | | |
| 144 | Chapter 21 Test | | | |
| Chapter 22: Internal Transport | | | | |
| 145 | 22.1 The Blood | 539–45 |  | Evidence of God’s design in blood clotting |
| 146 | Lab 22a Human Blood |  |
| 147 | 22.2 The Heart | 545–47 |  |  |
| 148 |  | Lab 22b Human Blood Circulation |  |
| 149 | 547–50 |  |  |
| 22.3 Blood Vessels and Circulations | 550–54 |  |  |
| 150–151 | 22.4 The Lymphatic System | 555–57 |  | The ability of the body to resist disease as evidence of God’s design |
| 22.5 Immunity | 557–63 |  | God’s providence in disease  A Christian response to those suffering from HIV/AIDS  Challenge to share the gospel |
| 152 | 22.6 The Kidneys | 564–65 |  |  |
| 22.7 Accessory Excretory Organs | 565 |  |  |
| 22.8 Urine | 565–66 |  |  |
| 153 | Chapter 22 Review | | | |
| 154 | Chapter 22 Test | | | |
| Chapter 23: The Nervous System Control Part I | | | | |
| 155 | 23.1 Neurons | 567–71 |  | God’s design of the nervous system |
| 156 | 23.2 Divisions of the Nervous System | 571–76 |  | Job as an example of God’s sovereignty in difficulties  Christ as the source of the believer’s strength  Biblical response to stress (1 Peter 5:7) |
| 157 |  |  | Lab 23a Human Reflexes |  |
| 158 | 23.3 Minor Senses | 577–79 |  |  |
| 23.4 The Ear: Hearing and Balance | 579–82 |  |  |
| 159 |  |  | Lab 23b Minor Senses in Humans |  |
| 23.5 The Eye and Sight | 582–85 |  | Structure of the eye as evidence of intelligent design  The healing of the blind man in Mark 8 |
| 160 |  |  | Lab 23c The Human Eye and Ear |  |
| Chapter 23 Review | | | |
| 161 | Chapter 23 Test | | | |
| Chapter 24: Hormones and the Human Mind Control Part II | | | | |
| 162–163 | 24.1 Hormones | 586–89 | Lab 24 Drugs in Our Culture\*\* |  |
| 24.2 The Endocrine Glands | 589–96 |  | Principles of spiritual maturity  Biblical principles regarding peer pressure  Unbiblical use of feelings or circumstances as an excuse for sin  Importance of witnessing  Laying up treasures in heaven  Importance of spending time in God’s Word |
| 164–165 | 24.3 Drugs and Addiction | 596–604 |  | Submission to the Lord’s will  God’s provision of ways of escape from temptation  Christians’ responsibility to care for their bodies  Miraculous healings in the Bible  Biblical principles regarding alcohol |
| 24.4 Addiction | 605–7 | Biblical principles regarding Christians’ use of psychoactive drugs  Depending on strength from God to resist temptation |
| 166 | If assigned, have students present Lab 24 research. | | | |
| Chapter 24 Review | | | |
| 167 | Chapter 24 Test | | | |
| Chapter 25: Human Reproduction | | | | |
| 168 | 25.1 Male Reproductive System | 608–11 |  | Biblical principles of marriage  Relationship between man and wife as example of relationship between Christ and the church  Stewardship of the body  Circumcision in the Old and New Testaments |
| 25.2 Female Reproductive System | 611–14 |  |  |
| 169 | 25.3 Human Embryology and Birth | 614–19 |  | Parents’ responsibility to raise children to love and fear God |
| 170–171 | 25.4 Fallen Human Sexuality | 619–23 |  | Biblical view of sexual relationships  Scripture passages regarding adultery  The Bible’s challenge to have a pure thought life  Avoiding situations that can lead to temptation  Grace to escape from temptation  Walking in the Spirit  Scripture passages regarding homosexuality  Principles for dealing with sexual temptation  Biblical principles of disease |
| 25.5 Sanctity of Human Life | 623–26 |  | The value of human life  Scripture passages regarding capital punishment  Christ’s provision of Redemption  Yielding to Christ  The Bible and abortion |
| 172 |  |  | Lab 25 Chicken Embryology |  |
| Chapter 25 Review | | | |
| 173 | Chapter 25 Test | | | |
| Final Material | | | | |
| 174–176 |  |  | Laboratory Final Examination: The Rat |  |
| 177 | Final Review | | | |
| 178 | Final Exam | | | |