

## Curriculum Guide for 4<sup>th</sup> Grade Science

### Unit 1: Life Science: Stability

10 weeks

S4.1, S4.2, S4.3

#### Biblical Worldview Essential Questions

**How do we know that God holds everything together?**

**Why did God create all the different animals?**

Objectives	Methods	Resources	Assessment
<p>The students will</p> <p><u>Design of Life</u></p> <ol style="list-style-type: none"> <li>1. observe living things and identify their common characteristics.</li> <li>2. describe how organisms acquire materials and energy, and how they develop and reproduce.</li> <li>3. state how various living things respond and adapt to their environment.</li> <li>4. draw pictures of their observations in order to identify the similarities and differences between three types of cells.</li> <li>5. label and describe the levels of organization of an organism, from cell to biosphere.</li> <li>6. determine whether yeast acquires materials and energy, responds, and adapts.</li> <li>7. determine develops and reproduces and is made of cells.</li> <li>8. identify and describe the principles of commonality, uniqueness, and dependence among living things.</li> <li>9. identify examples of the characteristics of living things.</li> </ol> <p><u>Order of Life</u></p> <ol style="list-style-type: none"> <li>10. investigate simple classification.</li> <li>11. investigate various body plan characteristics.</li> <li>12. demonstrate simple classification of animals.</li> <li>13. recognize animal responses to internal and external stimuli.</li> <li>14. identify the living and nonliving factors of specific habitats.</li> <li>15. analyze, compare, and identify and organism.</li> <li>16. compare classification systems.</li> <li>17. distinguish similarities between specific organisms.</li> </ol> <p><u>Diversity of Life</u></p> <ol style="list-style-type: none"> <li>18. identify unique features and unique combinations of features within a set of animals.</li> </ol>	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Guided class discussion</li> <li>• Group reading</li> <li>• Completing <i>Science Notebook</i> worksheets individually, in groups, and within classroom discussion</li> <li>• Small animal observation stations</li> <li>• Yeast experiment</li> <li>• Coin demonstration</li> <li>• “Find the reward at the end of the trail” activity</li> <li>• “Choose a tool” activity</li> <li>• “Fix the flashlight” activity</li> <li>• “A frog’s niche” activity</li> <li>• “Balancing scale” activity</li> <li>• “Feather” experiment</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher and student text (<i>Purposeful Design, Systems: Science Level 4</i>)</li> <li>• Student Science Notebook (<i>Purposeful Design, Systems: Science Notebook Level 4</i>)</li> <li>• Live animal</li> <li>• Microscope, plant cell slide, amoeba slide, cheek cell slide.</li> <li>• Flatbread (yeast-free, bread containing yeast, dry baker’s yeast, sugar, water, balloons.</li> <li>• Animal card posters.</li> <li>• Transparency T-02A</li> <li>• 8 coins, including a penny, nickel, dime, and quarter.</li> <li>• Index cards.</li> <li>• Working flashlight that can be taken apart easily.</li> <li>• Transparency T-04 A,B,C,D.</li> <li>• Balance scale, weights.</li> </ul>	<ul style="list-style-type: none"> <li>• Science Notebook worksheets (<i>Purposeful Design, Systems: Science Notebook Level 4</i>)</li> <li>• Response to classroom questions.</li> <li>• Chapter reviews (<i>Purposeful Design, Systems: Science Level 4 Student Notebook</i>)</li> <li>• Chapter tests.</li> </ul>

<p>19. recognize the unique features of various body plans.</p> <p>20. research, organize and analyze data.</p> <p>21. describe unique response features and behaviors of animals.</p> <p>22. identify unique features of species that enable them to survive.</p> <p>23. evaluate how different organisms use different body parts for similar functions.</p> <p>24. discuss diversity in extinct species.</p> <p><u>System of Life</u></p> <p>25. will identify systems and system functions.</p> <p>26. demonstrate cooperation and competition in nature.</p> <p>27. analyze how a species is dependent upon and affected by its habitat and ecosystem.</p> <p>28. evaluate factors that help to balance an ecosystem.</p> <p>29. identify and describe types of ecological imbalance.</p> <p>30. investigate balance and imbalance in an ecosystem by analyzing and then describing cause and effect relationships.</p> <p>31. identify specific ways that people help restore damaged ecosystems</p>			
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## Curriculum Guide for 4<sup>th</sup> Grade Science

### Unit 2: Physical Science: Energy

10 weeks

S4.1, S4.2, S4.5

#### Biblical Worldview Essential Questions

**What purpose does Christ see in energy?**

**Why did God create energy?**

Objectives	Methods	Resources	Assessment
<p>The students will</p> <p><u>Energy and Heat</u></p> <ol style="list-style-type: none"> <li>1. analyze sources of energy, noting the movement and changes generated by energy.</li> <li>2. describe potential and kinetic energy.</li> <li>3. identify and label kinetic and potential energy.</li> <li>4. measure and explain the transfer of thermal energy.</li> <li>5. differentiate between heat and thermal energy.</li> <li>6. investigate the transfer of energy.</li> <li>7. state in their own words the principles of physical science.</li> </ol> <p><u>Light and Sound</u></p> <ol style="list-style-type: none"> <li>8. identify some of the properties of waves, light, and sound.</li> <li>9. compare and contrast light and sound using wave parts and properties.</li> <li>10. contrast the speeds, types, and sources of waves for light and sound.</li> <li>11. describe electromagnetic radiation.</li> <li>12. analyze and describe how light and sound interact with matter.</li> <li>13. construct simple instruments to identify some properties of light and sound.</li> <li>14. investigate how light and sound are used in communication.</li> </ol> <p><u>Motion and Force</u></p> <ol style="list-style-type: none"> <li>15. identify and describe the kinds of motion and forces they have observed in moving objects.</li> <li>16. name three main types of motion and list several examples of each.</li> <li>17. describe the differences between contact and noncontact forces.</li> <li>18. demonstrate Newton's First Law of Motion.</li> <li>19. state Newton's Second and</li> </ol>	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Guided class discussion</li> <li>• Group reading</li> <li>• Completing <i>Science Notebook</i> worksheets individually, in groups, and within classroom discussion</li> <li>• "Paper clip" activity, "rubber band" activity</li> <li>• "Butter melt" activity</li> <li>• "Egg Drop Challenge"</li> <li>• "Electroscope" activity</li> <li>• "Waves" activity</li> <li>• "Prism" activity</li> <li>• "Flashlight, balloon, mirror" activity to experience sound waves</li> <li>• "Observing motion" activity</li> <li>• "Jar roll" and "Ball drop" activity</li> <li>• "Christmas lights" activity</li> <li>• "Compare matter" activity</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher and student text (<i>Purposeful Design, Systems: Science Level 4</i>)</li> <li>• Student Science Notebook (<i>Purposeful Design, Systems: Science Notebook Level 4</i>)</li> <li>• Book, apple, flashlight</li> <li>• Toy cars, tennis balls</li> <li>• Thermometers</li> <li>• Styrofoam cups</li> <li>• Domino set</li> <li>• Metal spring toys</li> <li>• Flashlight, glow stick, matches</li> <li>• Electric fan</li> <li>• Tennis balls, coins, strings, large paper clips.</li> <li>• Ropes, paper</li> <li>• String, balloons</li> <li>• String of Christmas lights</li> <li>• Measuring cups, oil, water, cups, scale, clay, cornstarch, wooden blocks.</li> </ul>	<ul style="list-style-type: none"> <li>• Science Notebook worksheets (<i>Purposeful Design, Systems: Science Notebook Level 4</i>)</li> <li>• Response to classroom questions.</li> <li>• Chapter reviews (<i>Purposeful Design, Systems: Science Level 4 Student Notebook</i>)</li> <li>• Chapter tests.</li> </ul>

<p>Third Laws of Motion.</p> <p>20. perform experiments to test Newton's laws.</p> <p>21. identify the difference between relative and apparent motion.</p> <p><u>Matter and Its Uses</u></p> <p>22. compare the physical properties of various liquids, solids, and semi-solids.</p> <p>23. name and define the four main parts of the atom.</p> <p>24. construct a model to show how atoms combine to form molecules.</p> <p>25. describe the physical properties of reactants.</p> <p>26. construct a model of an atom.</p>			
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## Curriculum Guide for 4<sup>th</sup> Grade Science

### Unit 3: Earth & Space Science: Balance

10 weeks

S4.1, S4.2, S4.4

#### Biblical Worldview Essential Questions

**How does the earth and space prove that God created the world?**

**Why do you think that God created the earth and space?**

**How can you compare the three layers of the earth (Crust, Mantle, and Core) to the Trinity? (Father, Son, and Holy Spirit)**

Objectives	Methods	Resources	Assessment
<p>The students will</p> <p><u>The Lithosphere</u></p> <ol style="list-style-type: none"> <li>1. analyze the different components of soil.</li> <li>2. name and categorize the layers of the earth.</li> <li>3. model the three basic types of plate boundaries.</li> <li>4. differentiate between physical and chemical weathering.</li> <li>5. name and describe the layers of a soil profile.</li> <li>6. demonstrate how movement at a transform boundary can cause an earthquake.</li> <li>7. explain the importance of conserving our resources.</li> <li>8. illustrate the four principles of Earth Science.</li> </ol> <p><u>The Hydrosphere</u></p> <ol style="list-style-type: none"> <li>9. calculate the amount of water in several living and nonliving items.</li> <li>10. recount the composition and density of water.</li> <li>11. perform an experiment to observe the effects of evaporation.</li> <li>12. substantiate how groundwater accumulates.</li> <li>13. give reasons to protect estuaries.</li> <li>14. categorize the salinity of water.</li> <li>15. describe several ways that pollution affects a watershed.</li> </ol> <p><u>The Atmosphere</u></p> <ol style="list-style-type: none"> <li>16. relate the movement of water to the movement of air.</li> <li>17. list at least two characteristics of each of the four main layers of the atmosphere.</li> <li>18. summarize the processes in which solar radiation heats the earth's surface.</li> <li>19. state the process in which</li> </ol>	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Guided class discussion</li> <li>• Group reading</li> <li>• Completing <i>Science Notebook</i> worksheets individually, in groups, and within classroom discussion</li> <li>• “Soil and Sand” activity</li> <li>• “Playground swing” activity</li> <li>• “Moving plates” activity</li> <li>• “Tug-of-war” activity</li> <li>• “Condensation” activity</li> <li>• “Current observation” activity</li> <li>• “What makes it noon?” activity</li> <li>• “Making observations” activity</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher and student text (<i>Purposeful Design, Systems: Science Level 4</i>)</li> <li>• Student Science Notebook (<i>Purposeful Design, Systems: Science Notebook Level 4</i>)</li> <li>• Clear jars, sand, potting soil</li> <li>• Wax paper, graham crackers, pudding, water, plastic bottles</li> <li>• Tug-of-war rope</li> <li>• Two glasses, ice</li> <li>• Food coloring, pie tins, milk</li> <li>• Light, Styrofoam ball</li> <li>• Bag of gumballs</li> </ul>	<ul style="list-style-type: none"> <li>• Science Notebook worksheets (<i>Purposeful Design, Systems: Science Notebook Level 4</i>)</li> <li>• Response to classroom questions.</li> <li>• Chapter reviews (<i>Purposeful Design, Systems: Science Level 4 Student Notebook</i>)</li> <li>• Chapter tests.</li> </ul>

<p>clouds are formed.</p> <p>20. interpret how changes in air pressure cause specific weather conditions.</p> <p>21. construct barometers.</p> <p>22. utilize factors to predict a region's climate.</p> <p><u>The Universe</u></p> <p>23. draw pictures to show the factors that determine the time of day and season.</p> <p>24. compare and contrast the design and accuracy of at least three instruments</p> <p>25. experiment and determine the relationship between speed and distance in planetary motion.</p> <p>26. develop their own unit of measure and identify the three basic galaxy types.</p> <p>27. evaluate how distance affects observation.</p> <p>28. calculate, compare, and illustrate relative distances of the planets.</p> <p>29. defend the Anthropic Principle.</p>			
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Curriculum Guide for 4<sup>th</sup> Grade Science

Unit 4: Human Body: Wellness

6 weeks

S4.1, S4.2

**Biblical Worldview Essential Questions**

**What was God’s purpose for creating human life?**

**Why do you think that God created the human body so eloquently?**

**How can the human body show God’s amazing power?**

Objectives	Methods	Resources	Assessment
<p>The students will</p> <p><u>Body Systems I</u></p> <ol style="list-style-type: none"> <li>classify the levels of organization in living and nonliving systems.</li> <li>list the three main parts of the cardiovascular system.</li> <li>name, describe, and illustrate the four main components of blood.</li> <li>compare and contrast the structure and function of the three types of blood cells.</li> <li>recall the immune system’s four lines of defense.</li> <li>determine their own pulse rates.</li> <li>illustrate their understanding of heart-healthy habits.</li> </ol> <p><u>Body Systems II</u></p> <ol style="list-style-type: none"> <li>analyze and write about the relationship between body systems and teamwork.</li> <li>state a comparison between a factory and the human body.</li> <li>label the parts and model the functions of the digestive system.</li> <li>construct a model of the lungs and diaphragm.</li> <li>label and define three parts of the urinary system.</li> <li>gather, average, and compare data about their vital capacity.</li> <li>chart their nutrition, exercise, and relaxation habits.</li> </ol>	<ul style="list-style-type: none"> <li>Lecture</li> <li>Guided class discussion</li> <li>Group reading</li> <li>Completing <i>Science Notebook</i> worksheets individually, in groups, and within classroom discussion</li> <li>“Toy soldier” activity</li> <li>“Feel the beat” activity</li> <li>“Team” activity</li> <li>“Candy bar” activity</li> <li>“Starch ingestion and digestion” activity</li> <li>“Body system team” directions</li> </ul>	<ul style="list-style-type: none"> <li>Teacher and student text (<i>Purposeful Design, Systems: Science Level 4</i>)</li> <li>Student Science Notebook (<i>Purposeful Design, Systems: Science Notebook Level 4</i>)</li> <li>Toy soldiers, blocks</li> <li>Chocolate candy bar</li> <li>Ziplock bag with beads and string</li> <li>30 red, blue, green beads, trail mix without candy, large bowl, 3 large ziplock bags</li> </ul>	<ul style="list-style-type: none"> <li>Science Notebook worksheets (<i>Purposeful Design, Systems: Science Notebook Level 4</i>)</li> <li>Response to classroom questions.</li> <li>Chapter reviews (<i>Purposeful Design, Systems: Science Level 4 Student Notebook</i>)</li> <li>Chapter tests.</li> </ul>