

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

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

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

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