

Curriculum Guide for 5th Grade Science

Unit 1: Life Science: Cycles

10 weeks

S5.1; S5.2; S5.3; S5.4; S5.7

Biblical Worldview Essential Questions

How does the design of the animal life cycles reveal the Designer?

Objectives	Methods	Resources	Assessment
<p>The students will</p> <p><u>Natural Cycles</u></p> <ol style="list-style-type: none"> 1. Analyze the benefits of a cycle. 2. Explain the cycling of important elements. 3. Summarize the stages of the water cycle. 4. Recount the main components of the carbon and oxygen cycle. 5. Identify the components of the nitrogen cycle and explain the importance of nitrogen to living things. 6. Graph and analyze data related to the nitrogen cycle. 7. Discover the results of acid precipitation and formulate ways to prevent air pollution. <p><u>Life Cycles</u></p> <ol style="list-style-type: none"> 8. Relate the general definition of cycle to seven stages of the human life cycle. 9. Relate their understanding of three general concepts regarding life cycles to the specific life cycle of bacteria. 10. Analyze a fungal life cycle by examining a fungal life stage and the growth of mold. 11. Recount the life cycle of the flowering bean plant. 12. Name and summarize the stages in the salmon life cycle. 13. List the three life stages of brine shrimp. 14. Cite causes and effects of malaria. <p><u>Cells</u></p> <ol style="list-style-type: none"> 15. Evaluate how the process of machinery parts working together relates to the cell theory. 16. State the cell theory. 17. Summarize how traits are controlled by DNA, genes, and chromosomes. 18. List, illustrate, and paraphrase the events that occur during the 	<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 • "Keep it going" activity • "Microscope practice" activity • "Human life cycle diagram" activity • "Peanut butter and jelly" activity • "Yeast" activity • "Popsicle building" activity • "Pipe cleaner DNA" activity • "Cell growth" activity • "Observing animal cells" and "Observing plant cells" activity 	<ul style="list-style-type: none"> • Teacher and student text (Purposeful Design, <i>Change: Science Level 5</i>) • Student Science Notebook (Purposeful Design, <i>Change: Science Notebook Level 5</i>) • Small game pieces, containers • Microscope, broad green leaves, clear fingernail polish, clear tape • 2 pieces of poster board, several magazines • 6 slices of bread, peanut butter, jelly, butter knife • Yeast • Popsicle sticks • Pipe cleaners • Brown paper grocery bags, balloons • Onion, Elodea plant, microscopes, slides, cover slips, eyedroppers, toothpicks, tweezers, water 	<ul style="list-style-type: none"> • Science Notebook worksheets (Purposeful Design, <i>Change: Science Notebook Level 5</i>) • Response to classroom questions • Chapter reviews (Purposeful Design, <i>Changes: Science Level 5 Student Notebook</i>) • Chapter tests

<p>cell cycle.</p> <p>19. Relate the levels of cell organization to the development of an organism, beginning with a fertilized egg.</p> <p>20. Observe, draw, and discriminate between animal and plant cells.</p> <p>21. Explain how cancer develops.</p> <p><u>Ecological Succession</u></p> <p>22. Interpret and dramatize the consequences of interruptions.</p> <p>23. Identify two types of ecological succession.</p> <p>24. Examine the effects of the glacial retreat at Glacier Bay.</p> <p>25. Describe and illustrate the four seres of secondary succession.</p> <p>26. Give examples of how secondary succession has taken place since the fires of 1988 in Yellowstone National Park.</p> <p>27. Prepare models to demonstrate primary and secondary succession.</p> <p>28. Examine and summarize two events in history that initiated ecological succession.</p>			
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Curriculum Guide for 5th Grade Science

Unit 2: Physical Science: Transformations

10 weeks

S5.1; S5.3; S5.4; S5.5; S5.7

Objectives	Methods	Resources	Assessment
<p>The students will</p> <p><u>Measuring Matter</u></p> <ol style="list-style-type: none"> 1. Recognize the need for standard units of measurement and select logical and accurate ways to measure. 2. Compare the metric and customary measurement systems. They will recall common metric prefixes. 3. Measure and calculate area and volume. 4. Distinguish between mass and weight and cite the differences between the Celsius and Fahrenheit scales. 5. Calculate the density of an object. 6. Take metric and customary measurements and calculate areas of volumes. 7. Construct an object that is buoyant and analyze its buoyancy. <p><u>Changing Matter</u></p> <ol style="list-style-type: none"> 8. Observe and then compare physical characteristics of events occurring in the classroom. They will evaluate the importance of making detailed observations and gathering evidence. 9. Describe how a physical change affects bonds and physical properties. They will differentiate Johannes Diderik vander Waals forces from chemical bonds. 10. Distinguish between substances and mixtures. They will demonstrate how to use physical changes to separate mixtures. 11. Identify differences between chemical and physical changes. They will name two chemical properties of matter. 12. Contrast chemical and nuclear changes. They will identify fission and fusion as two forms of nuclear change. 13. Make models of water 	<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 • "Rolling ball" activity • "Measure and Calculate" activity • "measuring mass and weight" activity • "Cork/rock float" activity • "Sink the boat" activity • "Iron/sand" activity • "Mix it up" activity • "Marshmallow models" activity • "Work, work, work" activity • "Force and distance in a lever" activity • "Attract and repel" activity • "Flash in the pan" activity 	<ul style="list-style-type: none"> • Teacher and student text (<i>Purposeful Design, Change: Science Level 5</i>) • Student Science Notebook (<i>Purposeful Design, Change: Science Notebook Level 5</i>) • Large rubber ball • Rulers, metersticks, yardsticks • Metric scale • Clear container with water, cork, rock • Coins, foil boats, plastic tubs, water • Sand, iron shavings, magnet • Glass containers, bleach, water, cotton swabs, food coloring, chocolate bar, waxed paper • Large and small marshmallows, flat toothpicks, tissue paper • 2-3 large books, golf ball, ping-pong ball, wrapping paper tube • Pennies, cardstock, metersticks, film canisters, tape, rulers, markers • Bar magnets, small cardboard squares, white paper, iron filings • Styrofoam plates, aluminum pie pans, tape, paper, small pieces of wool 	<ul style="list-style-type: none"> • Science Notebook worksheets (<i>Purposeful Design, Change: Science Notebook Level 5</i>) • Response to classroom questions • Chapter reviews (<i>Purposeful Design, Changes: Science Level 5 Student Notebook</i>) • Chapter tests

<p>molecules to simulate physical, chemical, and nuclear changes. They will demonstrate the solubility and insolubility of different liquids.</p> <p>14. Analyze how combustion is used to power a variety of vehicles.</p> <p><u>Force and Work</u></p> <p>15. Assess the advantages of using tools to accomplish work.</p> <p>16. Describe the relationship between speed, velocity, and acceleration. They will calculate the speed of a given object.</p> <p>17. Use appropriate metric units to calculate force and work.</p> <p>18. Classify and describe levers and inclined planes as types of simple machines.</p> <p>19. Locate and label the load, effort, and fulcrum for each of the three classes of levers.</p> <p>20. Demonstrate the three classes of levers. They will describe the relationship of the distance between the effort and the fulcrum to the amount of effort needed in a first-class lever.</p> <p>21. Calculate the grade of a slope. They will give examples of how simple machines were used in ancient civilizations.</p> <p><u>Electricity and Magnetism</u></p> <p>22. Conclude how different life would be without electrical energy.</p> <p>23. Explain what an electric charge is and how static electricity occurs.</p> <p>24. Analyze electric current, compare and contrast it to static discharge, and describe and illustrate voltage.</p> <p>25. Compare and contrast series and parallel circuits and evaluate how they affect an electric current.</p> <p>26. Illustrate magnetic fields and describe the relationship between current electricity and magnetism.</p> <p>27. Detect the buildup and discharge of static electricity and identify how the length of circuits affects the strength of an electromagnet.</p> <p>28. Identify transformations of energy and rate different methods of producing electricity.</p>			
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Curriculum Guide for 5th Grade Science

Unit 3: Earth & Space Science: Predictability

10 weeks

S5.1; S5.4; S5.5; S5.7

Objectives	Methods	Resources	Assessment
<p>The students will</p> <p><u>Earth's Processes</u></p> <ol style="list-style-type: none"> Examine natural, predictable, and necessary life changes and distinguish between physical and chemical changes in matter. Describe a natural rock cycle, using the names of three major rock types. The will also list several minerals that are useful to their daily lives. Summarize the theories of plate tectonics and continental drift. The will predict possible features and events that may occur at different types of plate boundaries. Identify key features of the ocean floor and explain how they were formed. Evaluate how salinity, density, and temperature affect ocean currents. They will summarize the causes and effects of El Niño. Compare solutions with different densities, associating water density with ocean currents. They will also simulate geologic core sampling. Apply the concept of magnetism to changes on the ocean floor as they construct a model of opposite magnetic polarities. <p><u>Natural Resources</u></p> <ol style="list-style-type: none"> Apply their knowledge of basic human needs to determine the necessary resources for survival on a deserted island. They will evaluate how to conserve resources in order to survive. List natural resources and distinguish between renewable and nonrenewable resources. Identify the three main types of fossil fuels, explain how each is formed, and give examples of how each is used. Cite physical characteristics of metals and distinguish them as 	<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 "Physical versus chemical changes" activity "Cookie/rock" activity "Boat float" activity "Cupcake core samples" activity "Survivor Game" activity "Smell" activity "Mineral properties" activity "Aire dare" activity "Under pressure" activity "Thermometer" activity 	<ul style="list-style-type: none"> Teacher and student text (Purposeful Design, <i>Change: Science Level 5</i>) Student Science Notebook (Purposeful Design, <i>Change: Science Notebook Level 5</i>) Index cards 3 types of cookies Aluminum boil, small washers, ziplock bags, dishpans, buckets, water Multi-layered cupcakes Boiled eggs, stick matches Mineral samples Empty plastic soda bottles, clay, funnel, cups, water, toothpicks Large marshmallows, clear containers, drinking straws, clay, markers Desk lamp, 3 thermometers 	<ul style="list-style-type: none"> Science Notebook worksheets (Purposeful Design, <i>Change: Science Notebook Level 5</i>) Response to classroom questions Chapter reviews (Purposeful Design, <i>Changes: Science Level 5 Student Notebook</i>) Chapter tests

<p>a subgroup of minerals. They will simulate how ore is extracted.</p> <p>12. Summarize the environmental and economic issues surrounding landfills and waste. They will plan, prepare, and propose ways to reduce, reuse, and recycle.</p> <p>13. Perform three tests to identify specific properties of minerals. They will decide on an appropriate use for oil based on their observation and understanding of its properties.</p> <p>14. Describe how solar energy, biomass, and geothermal energy are used as alternative energy sources.</p> <p><u>Weather and Climate</u></p> <p>15. Observe and recall three pertinent properties of air through experimentation.</p> <p>16. Evaluate the relationship between unequal heating, differences in air pressure, and convection currents. They will relate how those relationships influence the formation of wind(s).</p> <p>17. Explain the factors that influence the formation of global winds. They will identify where the different global wind belts are located.</p> <p>18. Determine the relationship between an air mass and a front. They will classify four types of air masses and two types of fronts.</p> <p>19. Demonstrate a proper understanding of common symbols used on weather maps.</p> <p>20. Assemble and employ a model of an anemometer. They will prepare a weather forecast using a weather map and common weather symbols.</p> <p>21. Compare and contrast mountain breezes, valley breezes, jet streams, and monsoons. They will describe how each one is formed.</p> <p><u>Sun, Earth, and Moon</u></p> <p>22. Record descriptions of historical names of the moon. They will also construct and use an astrolabe.</p> <p>23. Compare and contrast the motions of Earth and its moon. They will also be able to state four factors that influence these</p>			
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<p>motions.</p> <p>24. Model how Earth's tilt during its revolution around the sun causes the seasons, solstices, and equinoxes.</p> <p>25. Identify and model moon phases. They will illustrate lunar and solar eclipses.</p> <p>26. Illustrate how tides occur and describe the difference between a spring and a neap tide.</p> <p>27. Use scientific investigative methods to design and construct a simple telescope. They will also discuss the advance of technology leading to a greater understanding of the motions of the earth and the moon.</p> <p>28. Cite at least two facts about the <i>Apollo 11</i> moon mission and label three types of features on a lunar map.</p>			
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Unit 4: Human Body: Balance

6 weeks

S5.1; S5.4; S5.5; S5.6; S5.7

Objectives	Methods	Resources	Assessment
<p>The students will</p> <p><u>Transitions</u></p> <ol style="list-style-type: none"> Review the stages of a monarch butterfly's life cycle. Review the stages of a monarch butterfly's life cycle and relate the changes involved in metamorphosis to adolescence. Relate the changes that occur during puberty to the work of the endocrine system. They will also label six parts of the endocrine system and compare it to the nervous system. Illustrate the structure of the skin and will describe the cause and effect relationship between skin glands and pubescent changes. Associate the growth spurts of puberty with the endocrine system, genetics, and healthy eating and exercise. Label the basic structures of a tooth and evaluate their own oral hygiene habits. They will also distinguish between primary and permanent teeth. Evaluate their daily lifestyle choices in terms of balance and self-control. Summarize the processes that stimulate and regulate the human body's sleep cycle. They will also log and assess their own sleep and wake cycle. <p><u>Disease</u></p> <ol style="list-style-type: none"> Associate the malfunctions and failures of commonly used items to the unexpected impairment of the human body. They will also investigate a disease known since ancient times – leprosy. Determine the differences between infectious and noninfectious diseases. They will identify four major groups of pathogens. Identify certain infectious diseases and the pathogens that cause them. They will describe 	<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 "Transitions" activities "Missing teeth" activity "Bacteria" activity "Immune system introduction" activity "Pathogens introduction" activity 	<ul style="list-style-type: none"> Teacher and student text (Purposeful Design, <i>Change: Science Level 5</i>) Student Science Notebook (Purposeful Design, <i>Change: Science Notebook Level 5</i>) Scissors, glue, magazines, markers, large construction paper Pictures of kids with teeth missing Black light, bacterial glow lotion, soap, water 2 rubber balls (one large and one small), play dough, masking tape Balloons for every student, masking tape 	<ul style="list-style-type: none"> Science Notebook worksheets (Purposeful Design, <i>Change: Science Notebook Level 5</i>) Response to classroom questions Chapter reviews (Purposeful Design, <i>Changes: Science Level 5 Student Notebook</i>) Chapter tests

<p>viral reproductions.</p> <p>12. Identify genetic disorders and allergies as noninfectious diseases. The will classify infectious and noninfectious diseases based on given criteria.</p> <p>13. Identify integral parts of the immune and lymphatic systems and discuss the functions of each.</p> <p>14. Graph and analyze data of four specific infectious diseases. They will interpret how pathogens are transmitted and list preventive methods.</p> <p>15. Explain how the human body builds immunity to pathogens and will differentiate between active and passive immunity.</p>			
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