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FIFTH THROUGH EIGHTH GRADE

Religious
Values

I. Earth Science

A. Earth's Materials and Resources

1. Views of Earth

- a. Compare longitude and latitude. Explain how they are used to find location.
- b. Explain why all maps of the earth have distortions.
- c. Compare and contrast different map projections.
- d. Explain how modern maps are made.
- e. Explain how contour lines show elevation and landforms on a topographic map.
- f. List the rules of contour lines. Emphasis local landforms.

2. Minerals

- a. List the major characteristics of all minerals.
- b. Explain ways that minerals may be identified.
- c. Describe two types of mining.
- d. Identify uses of minerals.

3. Rocks

- a. Draw and explain the rock cycle. Identify where the rock cycle occurs.
- b. Explain how the three basic rock classes: igneous, metamorphic, and sedimentary, are classified.
- c. Describe how igneous rocks form. Describe the differences between intrusive and extrusive igneous rocks. Identify various uses of igneous rock.
- d. Identify types of sedimentary rocks. Describe how sedimentary rocks form. Explain the differences between clastic, chemical, and organic sedimentary rocks. Identify uses of sedimentary rocks.
- e. Describe how metamorphic rocks form. Identify types of metamorphic rocks.
- f. Describe how metamorphic rocks are used. Explain the difference between contact and regional metamorphism. Identify the difference between foliated and nonfoliated metamorphic rocks.

4. Resources

- a. Explain the difference between renewable and nonrenewable resources.
- b. List ways that natural resources can be conserved.
- c. Describe the origin of fossil fuels. Give examples of these fuels. List problems connected with use of fossil fuels.
- d. List advantages and disadvantages of alternate energy resources.

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Stewardship

Awe and
wonder

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B. Atmosphere and Weather

1. Composition and layers of atmosphere

- a. Describe the composition of the atmosphere. List the most common gases found in the atmosphere.
- b. Compare the characteristics of the four layers of the atmosphere: troposphere, stratosphere, mesosphere, and thermosphere. Explain how temperature and pressure change with altitude.
- c. Recognize that global winds move air masses.
- d. Explain what happens to solar energy as it reaches the atmosphere and surface of the earth.
- e. Compare energy transfer through radiation, conduction, and convection.

2. Factors of Weather

- a. Draw and label the water cycle.
- b. Explain how relative humidity is determined.
- c. Describe the formation of clouds. List the different types of clouds and how they differ.
- d. Explain how the four types of precipitation form.
- e. Identify and describe the four types of air masses and how they affect weather.
- f. Compare warm fronts, cold fronts, stationary fronts, and occluded fronts.
- g. Distinguish between cyclones and anticyclones.

3. Severe weather

- a. Describe how lightning and thunder occur.
- b. Compare and contrast tornadoes and hurricanes.
- c. List methods for forecasting severe weather.
- d. Describe how meteorologists collect data from weather stations and organize it on surface maps.
- e. Identify instruments meteorologists use to predict the weather.

4. Climates

- a. Distinguish between weather and climate.
- b. List factors that determine climate.
- c. Describe each of the earth's biomes.
- d. Determine what factors may cause changes in climate.
- e. Describe how global warming and the Greenhouse effect are connected.

5. Pollution

- a. Identify sources of air pollution.
- b. Describe how air pollution affects people and the environment.
- c. Explain how air pollution can be reduced.

Stewardship

Awe and wonder

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C. Astronomy

1. Early Astronomers

- a. Describe the contributions of Ptolemy, Copernicus, Brahe, Kepler, Galileo, and Newton.
- b. Explain two early ideas about the structure of the universe.

2. Tools of Astronomy

- a. Compare and contrast refracting and reflecting telescopes. Explain the advantages and disadvantages of each.
- b. Describe a radio telescope and how it works.

3. Earth, Sun, Moon system

- a. Describe the theory of the moon's origin.
- b. Describe the phases of the moon and what causes them.
- c. Distinguish between a solar and lunar eclipse.

4. Solar Systems

- a. Describe how the solar system formed.
- b. Identify the parts of the solar system.
- c. Explain how the sun produces energy.
- d. Explain how surface events on the sun affect the earth.
- e. Distinguish between rotation and revolution. Describe why there are seasons on Earth.
- f. Describe Kepler's three laws of motion.
- g. Explain the effects of distance and mass on gravity.
- h. Distinguish between inner and outer planets.
- i. Identify basic characteristics of the nine planets. Determine which of these characteristics would support life.
- j. Describe the moons of other planets.
- k. Describe seasons on other planets.
- l. Recognize that planets also can have phases.
- m. List other bodies located in the solar system.

5. Stars

- a. Explain how color helps to determine temperature.
- b. Describe how an astronomer can determine composition of a star by using a spectroscope.
- c. Classify stars by temperature and brightness.
- d. List measurements used to determine distances in space.
- e. Distinguish between apparent and actual motion of stars.
- f. Trace the life cycle of a star.
- g. Describe a supernova and explain why our sun will not end its life cycle as a supernova.

6. Galaxies and Universe

- a. Identify three types of galaxies.
- b. Describe what can be found in galaxies.
- c. Describe the big bang theory and give evidence to support it.

Respect for God's creation

Awe and wonder

Faith

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7. Exploration of Space

- a. Describe how a rocket works.
- b. Explain the uses of the different types of artificial satellites.
- c. Explain how space probe missions help us on earth.
- d. Describe the history of manned flights in space.
- e. Give examples of technology first used in space.

D. Oceans

1. Characteristics of Ocean water

- a. Describe the origin of ocean water.
- b. Describe the properties of ocean water such as salinity, composition, and temperature.

2. Ocean motion

- a. Describe surface currents and list the factors that control them.
- b. Describe deep currents and list the factors that control them.
- c. Identify the parts of a wave.
- d. Describe how waves form and move.
- e. Explain tides and how they are related to the sun, moon, and earth.

3. Ocean floor

- a. Differentiate between the features of the ocean floor including the continental shelf, the continental slope, the abyssal plain, the mid-oceanic ridge, rift zone, seamounts, and trenches.
- b. Describe techniques used to study the ocean floor.

4. Ocean life

- a. Conclude that oceans contain a wide variety of ecosystems and that photosynthesis and chemosynthesis transfer energy into the ocean's food chain.
- b. Recognize that ocean environments may be classified according to their depth.
- c. Analyze three ocean ecosystems: intertidal, coral reef, and estuary.
- d. List the key characteristics of plankton, nekton, and benthos.

5. Ocean resources

- a. Identify the ocean's living resources.
- b. Identify nonliving resources in the ocean.

6. Shoreline

- a. Differentiate between two types of shore zones (steep/rocky and sandy/sloping).
- b. Describe features found on each type of shore zone such as stacks, notches, terraces, barrier islands, and dunes.

**Respect for
God's creation**

Stewardship

**Awe and
wonder**

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E. Earth's Changing Surface

1. Soil formation

- a. Differentiate between weathering and erosion.
- b. Compare and contrast mechanical and chemical weathering and give examples.
- c. Describe how soil forms from rock through weathering and erosion.
- d. Compare and contrast different types of soil.
- e. Explain and differentiate between the A, B, and C soil horizons.

2. Water erosion

- a. Draw and label stream patterns.
- b. Describe the stages of a river – young, mature, and old.
- c. Identify and describe river deposits, to include alluvial fans, flood plains, levees, and deltas.
- d. Identify and describe the location of the water table.
- e. Explain how caves and sinkholes form as a result of erosion and deposition.

3. Wind erosion

- a. Explain why some areas are more affected by wind erosion than others.
- b. Describe the processes of deflation and abrasion.
- c. Identify landforms that result from wind erosion and deposition.
- d. List ways to prevent, limit, or repair erosion.

4. Glacier erosion

- a. Explain the formation and differences of alpine (valley) and continental glaciers.
- b. Identify landscape features formed by glacial erosion.
- c. Identify landscape features formed by glacial deposition.

5. Gravity erosion

- a. Explain the role of gravity as an agent of erosion and deposition.
- b. Identify types of rapid mass movement.
- c. Identify types of slow mass movement.

F. Earth's Interior

1. Layers of the Earth

- a. Identify Earth's layers as inner core, outer core, mantle, and crust.
- b. Compare and contrast the physical properties of the layers.
- c. Explain how scientists know about the interior of the earth.

2. Continental Drift

- a. Describe Wegner's hypothesis of continental drift.
- b. Discuss supporting evidence of his theory.

**Just
distribution of
resources**

**Awe and
wonder**

**Unfolding of
God's plan**

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c. Explain why Wegner’s idea of continental drift was initially rejected.

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d. Explain how sea floor spreading provides a way for continents to move.

3. Plate Tectonics

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a. Describe the different types of boundaries between plates: divergent, convergent, and transform fault boundaries.

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b. Explain the effects of plate tectonics found at each boundary, including the Ring of Fire.

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c. Describe how convection currents might be the cause of plate tectonics.

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d. Explain how scientists observe plate movement.

4. Earthquakes

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a. Describe the three forces that affect the earth’s crust – tension, compression, and shearing.

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b. Compare these forces with their corresponding faults – normal, reverse, strike-slip.

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c. Compare and contrast primary, secondary, and surface waves.

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d. Explain how an earthquake’s epicenter and focus are determined.

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e. Describe how earthquakes create tsunamis.

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f. Explain how seismologists measure the strength and intensity of earthquakes.

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g. Outline indoor and outdoor earthquake safety procedures.

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h. Describe ways to safeguard building against earthquake damage.

5. Volcanoes

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a. Compare the three types of volcanoes: shield, cinder cone, and composite.

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b. Identify the features of volcanoes.

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c. Compare and contrast factors affecting eruptions of volcanoes.

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d. Describe the formation and movement of magma.

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e. Summarize methods scientists use to predict volcanic eruptions.

G. Earth’s History

1. Geologic Time

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a. Explain how geologic time is reported in rock layers.

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b. Identify important dates on the geologic time scale.

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c. Explain how environmental changes result in the extinction of some species of animals.

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d. Explain how geologic time is divided into units.

Unfolding of God’s plan

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2. Fossils

- a. Describe ways that fossils form.
- b. Explain how fossils can be used to determine changes in the environment.
- c. Explain how index fossils and fossil correlation are used to determine rock ages.

3. Relative and Absolute Dating

- a. Differentiate between relative and absolute dating.
- b. State the principal of superposition and explain how unconformities alter the rock layers.
- c. Identify types of radioactive dating.

II. Physical Science

A. Basic Chemistry

1. Atomic structure
 - a. Describe the composition of matter.
 - b. Compare and contrast the parts of an atom: the protons and neutrons of the nucleus, and the electrons.
2. Periodic Table
 - a. Explain what an element is.
 - b. Identify elements in the periodic table.
 - c. Recognize that elements in the same family have similar properties.
3. Properties of Matter
 - a. Define a molecule.
 - b. Identify and compare the states of matter.
 - c. Explain how matter changes state.
 - d. Recognize the physical properties of matter.
 - e. Identify which physical properties can be observed and which can be measured (such as density = mass ÷ volume).
 - f. Describe the physical changes matter undergoes.
 - g. Compare a chemical change to a physical change.
4. Mixtures and Solutions
 - a. Describe how mixtures are made.
 - b. Describe how to separate mixtures.
 - c. Identify different kinds of mixtures and solutions.
5. Chemical Reactions
 - a. Define and identify compounds.
 - b. Classify compounds as acids or bases and describe some common uses of acids and bases.
 - c. Describe different kinds of chemical reactions.
 - d. Describe how some chemical changes can be prevented.

B. Forces and Motion

1. Newton's Laws
 - a. Explain what a force is.
 - b. List the three laws of motion.
 1. Inertia
 2. Force = mass x acceleration
 3. Action / reaction
2. Velocity and speed
 - a. Distinguish between velocity and speed.
 - b. Describe motion and explain how to measure it.
3. Gravity and friction
 - a. Relate the force of gravity to mass and distance.

Awe and wonder

Respect for the proper use of physical elements

God's unfolding plan

Natural wonders

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- b. Describe how to measure gravity.
- c. Explain how the force of friction opposed motion.
- 4. Application of forces
 - a. Describe how force affects motion.
 - b. Predict the results of balanced and unbalanced forces.

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C. Work and Machines

- 1. Simple machines
 - a. Explain how simple machines make tasks easier.
 - b. Describe the three types of levers.
 - c. Compare a lever to a pulley and to a wheel and axle.
 - d. Explain how inclined planes make tasks easier.
 - e. Describe three simple machines that are related to inclined planes.

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- 2. Compound machines

- f. Explain how simple machines work together in compound machines.
- g. Name examples of compound machines and how they benefit mankind.

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- 3. Structural design

- d. Describe the role of friction in the use of machines.
- e. Explain how to increase a machine's efficiency.

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- 4. Application of formulas – work = force x distance.

H. Energy

- 1. Potential vs. Kinetic energy

- a. Distinguish between potential energy and kinetic energy.
- b. Explain how potential energy and kinetic energy are related.
- c. Explain the law of conservation of energies.

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- 2. Chemical Energy

- a. Describe how chemical energy is stored in the bonds of molecules.
- b. Identify ways that chemical energy is used.
- c. Explain how chemical and nuclear reactions can be used to produce electricity.

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- 3. Magnetism and Electricity

- a. Recognize why some substances are magnetic.
- b. Explain how electricity and magnetism are related.
- c. Identify open and closed circuits.
- d. Distinguish types of circuits - parallel and series.
- e. Distinguish between insulators and conductors. Give examples.
- f. Explain how electrical power is measured (formulas).

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- 4. Light

- a. Define light by its properties.
- b. Define the meanings of transparent, translucent, and opaque.

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Awe and wonder

Just distribution of resources

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- c. Describe reflected and refracted light.
- d. Explore instruments using concave/convex mirrors/lenses such as microscopes, telescopes, and cameras.

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5. Heat

- a. Describe how thermal energy moves between substances through radiation, conduction, and convection.
- b. Compare energy transfer through radiation, conduction, and convection.
- c. Distinguish between heat and temperature.

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6. Sound

- a. Recognize how waves carry energy.
- b. Identify two different kinds of waves.
- c. Recognize how speed, frequency, and wavelength are related.
- d. Describe the way sound travels through the air. Describe the speed of sound.
- e. Describe what gives sound a different pitch and a different loudness.

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7. Nuclear

- a. Discuss fusion vs. fission.
- b. List beneficial uses of nuclear energy.
- c. Describe how objects become electrically charged and discharge electricity.

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III. Life Sciences

A. Structure and function of living things

1. Cell theory and organization.
 - a. Recognize that all living things are made up of cells.
 - b. Trace the organization of living things from cells to systems.
2. Cell structure
 - a. Compare the functions and structures of plant and animal cells.
 - b. Identify cell organelles and know their functions.
 1. Cell membrane
 2. Cell wall
 3. Nucleus
 4. Nuclear membrane
 5. Endoplasmic reticulum
 6. Mitochondrion
 7. Chloroplast
 8. Vacuoles
3. Cellular processes
 - a. Explain cellular processes.
 1. Diffusion
 2. Osmosis
 3. Active transport
 4. Respiration
 5. Photosynthesis
 6. Mitosis
 7. Meiosis
4. Prokaryotes vs. Eukaryotes
 - a. Distinguish between prokaryotes and eukaryotes.
 - b. Give examples of prokaryotes and eukaryotes.

B. Diversity of Life

1. Natural selection and evolution – explain the relationship between natural selection and evolution.
2. History of life – trace the history of life including theories of origin.
3. Classification
 - a. Describe early classification systems.
 - b. Recognize that scientists classify animals in order to show ways in which they are related.
 - c. Identify the hierarchy of classification. Conclude that all living things belong to one of five kingdoms.
 - d. Recognize that classification systems change as additional information about organisms becomes available.
 - e. Recognize that kingdoms are divided into smaller groups.
 - f. Describe the two-part scientific name of an organism.
 - g. Demonstrate how to use a dichotomous key to identify living things.

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Respect for God’s creation

Awe and wonder

God’s unfolding plan

Respect for God’s natural order

I, R	<p>C. Simple Organisms</p> <p>1. Viruses</p> <ol style="list-style-type: none"> Explain the structure of a virus and why viruses are considered living and nonliving. Explain how viruses affect humans and list diseases caused by viruses. Describe the use of viruses in technology. 	<p>Awe and wonder</p> <p>Respect for God's creation</p>
I, R	<p>2. Moneran (Bacteria)</p> <ol style="list-style-type: none"> Describe the characteristics of monerans. Distinguish between eukaryotes and prokaryotes. List types of monerans and give examples. State the helpful and harmful effects of monerans. Explain how bacteria are used in technology. 	<p>Respect for God's natural order</p>
I, R	<p>3. Protists</p> <ol style="list-style-type: none"> Identify the characteristics of protists. Describe how protists obtain food. Describe how protists move. Explain the different ways that protists reproduce. Classify protists by food and movement. 	
I, R	<p>4. Fungi</p> <ol style="list-style-type: none"> Describe the characteristics of fungus. Identify the types of fungus and give examples. Describe lichens and how they represent mutualism. 	
R(5)/ M R(5)/ M	<p>D. Plants</p> <p>1. Characteristics and needs.</p> <ol style="list-style-type: none"> List the characteristics of plants. List what plants need in order to grow. 	<p>Respect for God's creation</p>
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f. Draw and label a flower. Explain the function of each part.
Describe their functions in reproduction.

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g. Describe the parts of fruits and seeds.

5. Plant processes

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a. Describe photosynthesis.

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b. Compare photosynthesis to respiration.

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c. Describe the exchange of gasses in leaves.

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d. Describe the reproduction of flowering plants.

1. Fertilization.

2. Flower to fruit

3. Seed to plant.

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e. Explain how tropisms help plants survive.

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f. List the ways in which pollination occurs.

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g. Explain how seeds are distributed.

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h. Explain how plants reproduce asexually.

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i. Compare long-day and short-day plants.

E. Animals

1. List and describe characteristics and needs of animals.

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a. Explore the diversity of animals.

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b. Recognize that all animals have the same basic needs that are met in different ways.

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c. Distinguish between invertebrates and vertebrates.

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d. Describe types of symmetry found in animals.

2. Simple Invertebrates

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a. Describe the body structure of a sponge. Explain how they obtain food and reproduce.

b. Describe the two body forms of cnidarians. Explain how they obtain food.

c. Describe the structure of a flatworm. List three major classes of flatworms. Explain how they may affect human health.

d. Describe the body structure of roundworms. Explain how they might affect human health.

3. Mollusks and annelids

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a. Give examples of mollusks and describe the body structure.

b. Classify mollusks into three major classes. Explain how they are different.

c. Describe how mollusks obtain food.

d. Give examples of annelids and describe the body structure.

e. Explain how annelids obtain food.

4. Arthropods

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a. List and describe the characteristics of arthropods.

b. Classify arthropods according to the body parts that they possess.

c. Distinguish between complete and incomplete metamorphosis.

5. Echinoderms

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a. Describe the characteristics of echinoderms.

b. Explain how echinoderms move and obtain food.

Respect for life

Stewardship

R

6. Fish

- a. Identify the characteristics of fish.
- b. List and describe the three major classes of fish. Give examples of each.
- c. Explain how fish reproduce.
- d. Distinguish between ectotherms and endotherms.

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7. Amphibians

- a. Identify the characteristics of amphibians.
- b. Explain reproduction in amphibians. Describe the metamorphosis of a frog from tadpole to adult.
- c. Explain how amphibians are ecological indicators.

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8. Reptiles

- a. Identify characteristics of reptiles.
- b. Explain reproduction in reptiles. Describe an amniotic egg.
- c. Compare different types of reptiles.

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9. Birds

- a. List the characteristics of birds.
- b. Distinguish between down feathers and contour feathers.
- c. Explain how birds are able to fly.
- d. Compare different types of birds by movement, beaks, color, size, and habits.

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10. Mammals

- a. Identify characteristics of mammals.
- b. Compare and contrast different types of placental mammals.
- c. Describe monotremes and marsupials. Give examples.

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11. Animal behavior

- a. Distinguish between innate and acquired behaviors.
- b. Explain how different social behaviors benefit the animals.
- c. Explain how certain behaviors help animals to survive.

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F. Ecology

1. Interactions of living things

- a. Categorize living elements of an ecosystem as members of a population, a community, and an ecosystem.
- b. Identify the levels of living things – producers, consumers, and decomposers in a food chain.
- c. Distinguish between the three types of symbiosis.
- d. Identify how different organisms are helped or harmed by their symbiotic relationships with other organisms.

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2. Energy flow

- a. Differentiate between energy pyramid and food web.
- b. Illustrate the movement of energy through the producers, consumers, and decomposers using the energy pyramid and a food web.

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Stewardship

Awe and wonder

God's unfolding plan

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3. Cycles in Nature

- a. Describe the interdependent relationships of biotic and abiotic factors in an ecosystem.
- b. Recognize that abiotic elements flow through an ecosystem in cycles.
- c. Describe the cycles of water, carbon dioxide, oxygen, and nitrogen.

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4. Biomes

- a. Identify types of land biomes.
- b. Describe how plants and animals are adapted for living in different biomes.

I (5)/ R

5. Environmental problems and solutions

- a. Identify natural resources as reusable, renewable, or nonrenewable.
- b. Conclude that humans can conserve, reuse, and recycle to slow down the loss of natural resources.

I (5)/ R

G. Human Body System

I

1. Skeletal

- a. Identify the functions of the skeletal system.
- b. Describe the structure of a bone and how a bone grows.
- c. Identify and explain the movement of each of the types of joints. Give examples.
- d. Describe injuries and diseases of the skeletal system.

Respect for life

Human dignity

I

2. Muscular

- a. Identify the types of muscles by appearance and by function.
- b. Describe how muscles and bones work together to move the body.
- c. Identify and describe injuries and disease of the muscular system.

Awe and wonder

I

3. Integumentary

- a. List the functions of the skin.
- b. Draw and label a cross section of the skin including the two major layers of skin.
- c. Describe injuries and disease of the skin.

I (5)/ R

4. Circulatory

- a. Identify the major organs of the circulatory system. Describe the functions of each.
- b. Trace the flow of blood through the heart.
- c. List the four major parts of blood. Describe each and state their functions.
- d. Explain blood types and how they affect transfusion.
- e. Describe injuries and diseases of the circulatory system.

I

5. Lymphatic

- a. Explain the function of lymph.
- b. List each organ of the lymphatic system and describe its function.
- c. Describe injuries and diseases of the lymphatic system.

I (5)/ R

6. Respiratory

- a. List the major organs of the respiratory system.
- b. Trace the path of air through the respiratory system. Describe what happens to the air as it moves through each area.
- c. Explain how breathing and cellular respiration are connected.
- d. Describe injuries and diseases of the respiratory system.

I (5)/ R

7. Digestive

- a. List the major organs of the digestive system.
- b. Trace food as it moves through the digestive system and describes what happens to it.
- c. Describe injuries and diseases of the digestive system.
- d. Identify the six classes of nutrients and design an appropriate diet to include the proper amounts of each.

I

8. Excretory

- a. List the organs of the excretory system.
- b. Identify which organs are responsible for which waste products.
- c. Trace urine from its formation in the kidneys to the outside of the body.
- d. Describe injuries and diseases of the excretory system.

9. Nervous

- a. Explain the difference between the central and peripheral nervous system and how the two work together.
- b. Draw and label the structure of a neuron.
- c. Describe the parts of the brain and the function of each.
- d. Draw and label the major parts of the eye. Explain the function of each.
- e. Draw and label the major parts of the ear. Explain the function of each.
- f. Describe injuries and diseases of the nervous system.

I

10. Endocrine

- a. Define hormones and explain their functions in the human body.
- b. List the major endocrine glands and what they regulate.
- c. Describe injuries and diseases of the endocrine system.

I

11. Reproductive

- a. Explain the difference between asexual and sexual reproduction.
- b. Explain the difference between internal and external fertilization.
- c. List the major organs of the male and female reproductive system.
- d. Describe the menstrual cycle and how the female body prepares for a fertilized egg.
- e. Explain the development of the fertilized egg into the embryo and then into a fetus.
- f. Describe the process of birth.

I

I (5)	H. Human Health	
	1. Disease	
	a. Differentiate between infectious and noninfectious disease.	Awe and wonder
	b. Investigate the works of Pasteur, Koch, and Lister in the discovery and prevention of disease.	
I	2. Body Defenses	
	a. Describe how the body keeps out pathogens.	Temperance
	b. Explain how immune systems fight infection.	
	c. Describe challenges to the immune system (allergies, autoimmune, cancer, AIDS)	Respect for one's self
I/ R	3. Nutrition	
	a. Identify the six classes of nutrition and explain their importance.	
	b. Understand how to read nutrition facts labels.	
I	4. Drugs	
	a. Describe the difference between psychological and physical dependence.	
	b. Explain the hazards of tobacco, alcohol, and illegal drugs.	
	c. Distinguish between the positive and negative uses of drugs.	
I/ R	5. Healthy habits	
	a. Discuss methods that help prevent the spread of disease.	
	b. Describe the importance of good hygiene.	
	c. Explain the importance of sleep and exercise.	
	I. Genetics	
I (5)/ R	1. Mendel	
	a. Discuss his experiments.	Respect for life
	b. Distinguish between recessive and dominant traits.	
I (6)/ R	2. Inherited Traits	
	a. Distinguish between genes and traits.	Respect for God's creation
	b. Explain how genes and alleles are related to genotype and phenotype.	
	c. Use a Punnett square to predict the results of genotypes.	
	d. Describe three exceptions to Mendel's observations – incomplete dominance, multiple alleles, and polygenic inheritance.	Moral consciousness
	e. Recognize that different combinations of parental DNA produce variation in new organisms.	
I (6)/ R	3. Mitosis and Meiosis	
	a. Explain the stages of mitosis and when/where it occurs.	
	b. Explain the states of meiosis and when/where it occurs.	
I (5)/ R	4. DNA structure	
	a. Illustrate and label a DNA molecule.	
	b. Explain the relationship between DNA and genes.	
	c. Explain how DNA replicates.	
	d. List factors that may alter the DNA structure resulting in mutations.	
I (5)/ R	5. Genetic Engineering – research current uses of genetic engineering (cloning, DNA fingerprints, stem cells, the Genome Project).	

Grade 5

I. Inquiry

Process skills and inquiries are not an isolated unit of instruction and should be embedded throughout the content areas. Safety issues should be addressed as developmentally appropriate.

A. Process Skills

1. Observe
 - a. Use the senses and simple tools to gather information about objects or events such as size, shape, color, texture, sound, position, and change (qualitative observations).
2. Classify
 - a. Compare, sort, and group concrete objects according to two attributes.
 - b. Arrange objects in sequential order.
3. Measure
 - a. Use standard (U.S. customary and metric) to estimate and measure mass, length, area, perimeter, volume, and temperature to the nearest whole unit (quantitative observations).
4. Communicate
 - a. Use drawings, tables, graphs, written and oral language to describe objects and explain ideas and actions.
5. Infer
 - a. Explain or interpret an observation based on data and prior knowledge.
 - b. Discriminate between observations and inferences.
6. Predict
 - a. Use prior knowledge and observations to identify and explain in advance what will happen.
 - b. Discriminate between inferences and predictions.
7. Hypothesize
 - a. Devise a statement of assumption, based on observations, experiences, and research, that can be supported or refuted through experimentation.

8. Define variables
 - a. Identify independent (manipulated), dependent (responding), and controlled variables in an experiment.

B. Inquiry

1. Plan and conduct a simple investigation.
 - a. Identify questions that can be answered through scientific investigations.
 - b. Design and conduct a scientific investigation.
 - c. Use appropriate tools and techniques to gather, analyze, and interpret data.
 - d. Develop descriptions, explanations, predictions, and models using evidence.
 - e. Use mathematical thinking in all aspects of scientific inquiry.
 - f. Communicate outcomes and explanations.

C. Abilities Necessary to Do Technological Design

1. Identify appropriate problems for technological design.
 - a. Identify a specific need for a product.
 - b. Determine whether the product will meet that identified need.
2. Design a solution or product.
 - a. Compare and contrast different proposals using selected criteria (e.g., cost, time, trade-off, and materials needed).
 - b. Communicate ideas with drawings and simple models.