

**Diocese of Duluth
Science Outcomes
Preschool**

All grades will explore the following science process skills in a variety of settings and with a variety of materials:

Scientific Process

Observing	Classifying	Comparing
Measuring	Communication	Constructing Models
Interpreting Data	Recording Data	Predicting
Experimenting	Formulating and Testing Hypothesis	

Life Science

Content	Diocesan Outcome - Preschool
Human Body	Identify parts of the human body.
	Examine own fingerprints and compare to others.
	Measure own growth and compare to others.
	Understand that healthy foods help us grow.
	Understand that dental health relates to overall wellness.
Seasons & Weather	Identify seasonal changes, especially in relation to trees.
	Describe seasonal cycles (spring planting, fall harvest).
	Note weather and read thermometer in different seasons.
	Learn about properties of wind, rainbows, water, and sunlight.
	Match appropriate clothing to seasons.
	Understand how animals live in winter.
Animals & Plants	Identify parts of vegetables and fruits - compare likenesses and differences,
	Plant seeds - observe and record growth.
	Study the groundhog – compare myth to reality.
	Understand differences between bugs (insects) and spiders: body parts and legs.
	Observe and classify shells; learn about animals that live in shells.
	Maintain and observe a worm farm.
	Learn about life cycles of butterflies and frogs.
	Study birds – their characteristics and habitats.

Earth Science

Content	Diocesan Outcome - Preschool
Ecology	Appreciate the wonders of nature.
	Demonstrate the care for God’s earth through recycling, cleaning up litter, composting.
	Collect, identify, and classify items from nature.
Paleontology	Learn about fossils.
	Understand what a paleontologist does.

Physical Science

Content	Diocesan Outcome - Preschool
Magnetism & Electricity	Explore properties of magnets.
	Experiment with magnets.
	Explore properties of static electricity.
	Predict experiment and draw conclusions about static electricity.
Sink & Float	Explore the concept of sink and float with a variety of objects.
	Predict and test whether items will sink or float.
Force & Motion	Explore moving items using tools: levers, spoons, hammers, and wedges.
	Explore properties of balance, weight, and motion using eggs.
Chemistry	Observe change of properties during cooking of various materials.
	Create carbon dioxide using vinegar and baking soda – observe results.

**Diocese of Duluth
Science Outcomes
Kindergarten – Second Grade**

All grades will explore the following science process skills in a variety of settings and with a variety of materials:

Scientific Process

Observing	Classifying	Comparing
Measuring	Communication	Constructing Models
Interpreting Data	Recording Data	Predicting
Experimenting	Formulating and Testing Hypothesis	

Physical Science

Content	K	1	2	Kindergarten – Grade 2 Diocesan Outcomes
Structure of Matter				<i>Note: Additional State benchmarks achieved for this topic can be found in 3-6 grade diocesan curriculum</i>
				The student will describe objects in terms of color, size, shape, and weight. Texture. Flexibility and attraction to magnets (see outcomes for light, color, and magnets for possible repeat)
Energy Transformation				LIGHT AND COLOR Identify sources of light, both God-made (natural) and man-made (artificial).
				Understand that light moves in a straight line
				Demonstrate how light is reflected by a mirror.
				Predict and demonstrate the effects of color mixing.
				Identify the primary and secondary colors.
				Define shadows as areas where light is blocked.
				Explore ways to change the size and shape of shadows by manipulating a light source.
Force and Motion				FORCE and MOTION Explore the interactions of force and motion.
				Demonstrate ways of moving objects easier through the use of wheel push and pull.
				Understand gravity as a force that pulls objects toward the earth and causes friction. (repeated in Forces of Nature)
				Identify the simple machines and how each works (pulley, wheel and axle, inclined plane, lever)
				Develop definitions of work, force and energy.
				Develop ways to move items using simple machines.
				BUOYANCY Develop a definition of buoyancy.
				Predict and test if an object will sink or float.
				Predict and test the amount of load an object will hold
				Design a boat and test for buoyancy.
Forces of Nature				GRAVITY Understand the cause and result of gravitational force on different objects.
				MAGNETS Understand that magnets attract and repel each other and certain kinds of other materials.
				Predict, observe and record magnetic properties of various materials.

Life Science

Content	K	1	2	Kindergarten – Grade 2 Diocesan Outcomes
Diversity of Organism				GENERAL Identify the difference between living and nonliving things.
				Classify objects/materials as God-made (natural) or man-made (artificial).
				Use descriptive and comparative words to sort and classify materials.
				PLANTS Develop a definition of a seed in terms of what a seed does
				Identify the four parts of most plants: roots, stem, leaves, flower/fruit
				Identify needs of plants: soil, water, air, sunlight
				Record and interpret plant growth through pictures and graphs.
				Sort and classify plants and plant products based on two or more properties.
				Summarize the life cycle of a plant.
				ANIMALS Identify and describe an animal habitat.
				Identify physical characteristics of animals.
				Observe, sort and classify similar animals based on one or two properties.
	Interdependence of Life			
				Explain survival instincts of an animal.
				Identify, describe and sequence the life cycle of an animal
				ANIMALS Identify and describe an animal habitat. (repeated)
Heredity				Identify physical characteristics of animals. (repeated)
				Explain survival instincts of an animal. (repeated)
				The student will describe ways in which many plants and animals closely resemble but are not identical to their parents. The student will match adult animals and plants to their offspring.
Biological Populations Change over Time				Sort and classify dinosaurs according to their characteristics.
				Compare and contrast prehistoric times to life on earth today.
				Explain the terms: extinct, archeologist, and paleontologist.
				Describe the characteristics of the geological periods: Triadic, Jurassic, And Cretaceous.
Flow of Matter and Energy				See outcomes for plants and respiration
				Observe and describe predator and prey relationships.
				Compare and contrast plant eaters and meat eaters.
Human Organism				FIVE SENSES Name the five senses through which human beings experience the world.
				Match the five senses to their corresponding body parts.
				Explain the proper care of the senses.
				Understand how disabled persons accommodate the loss of one or more senses (e.g., blindness, deafness).
				HUMAN BODY Identify ways human beings keep safe and healthy while growing and changing.

Content	K	1	2	Kindergarten – Grade 2 Diocesan Outcomes
Human Organism				Identify emotions and apply them to appropriate situations.
				Identify outer body parts.
				Become familiar with inner body parts (bones and muscles).
				DENTAL HEALTH
				Explain the difference between a baby tooth and a permanent tooth.
				Compare the different types of teeth.
				Interpret the function of different types of teeth.
				Explain and demonstrate how to take care of teeth.
				Explain the effects of plaque on teeth.
Earth Structures and Processes				Explore and identify properties of our earth.
				Care for God’s creation through classroom recycling.
The Water Cycle, Weather and Climate				Identify and describe different types of weather.
				Identify, describe and sequence the four seasons in our area.
				Use a thermometer to measure hot, cold and warm temperatures.
				Observe and contrast daytime and nighttime skies.
				Observe record and interpret weather changes on charts and graphs.
				Identify and observe different types of clouds.
				Name and list different kinds of storms.
				Predict weather by observing clouds.
				Observe record and interpret weather changes on charts and graphs.
				Research and give a weather report.
				Describe the water cycle
The Universe				Discuss a model depicting the relationship between our Earth and other major bodies in our solar system (sun, moon, planets).
				Explore characteristics of stars and major constellations.

**Diocese of Duluth
Science Outcomes
Grades Three – Sixth**

All grades will explore the following science process skills in a variety of settings and with a variety of materials:

Scientific Process Skills

Observing	Recording data
Classifying	Inferring
Comparing	Predicting
Measuring	Decision making
Communicating	Experimenting
Organizing data	Controlling variables
Interpreting data	Formulating and testing hypothesis

Scientific method:

- Demonstrate how to solve problems and answer questions
- Understand what scientists do with their experimental data and how they interpret it
- Evaluate an experiment and develop a better plan for better results

Physical Science

Content	3	4	5	6	Grades 3-6 Diocesan Outcomes
Structure of Matter					PHYSICAL PROPERTIES OF MATTER
					Identify materials as solids, liquids and gases according to their characteristics.
					Test and discover whether a material is a solid, liquid or gas.
					Define matter and mass.
					Compare the properties of the different states of matter.
					Distinguish between length, mass, volume and temperature.
					Use appropriate tools for measuring length, mass, volume and temperature.
					Identify two units each for measuring length, mass, volume and temperature.
					Explain the relationship between temperature and the states of matter.
					BUOYANCY (repeated in forces and motion)
					Develop a definition of buoyancy.
					Predict and test if an object will sink or float.
					Predict and test the amount of load an object will hold.
				Design a boat and test for buoyancy.	
				CHEMISTRY	
				Understand that all matter is made up of small particles.	
				Define atom.	
				Identify the parts of the atom and their functions (proton, neutron, and electron).	
				Define element.	
				Become familiar with the Periodic Table of the Elements.	
				The student will describe the states of matter in terms of the space between particles.	
				Become familiar with properties of elements (freezing point, boiling point, density, etc.).	

Content	3	4	5	6	Grades 3-6 Diocesan Outcomes
					Define compound.
					Explain what a chemical formula is.
Chemical Reactions					Determine if a substance is an acid or base.
					Define indicator.
					Define neutralization.
					Give an example of physical and chemical change.
					Define oxidation and give examples of rapid and slow oxidation.
					Describe how corrosion of iron can be prevented.
					Describe fission and fusion.
Energy Transformation					SOUND AND LIGHT Define and understand causes of sound.
					Explain how sound and light travel.
					Determine sources of light – God-made (natural) vs. man-made (artificial).
					Describe, explain, and model reflection and refraction.
					Describe how white light can be separated into the colors of the spectrum.
					ELECTRICITY: GENERAL Define electricity and energy.
					Investigate how electricity is made, stored, and detected.
					Investigate questions related to electricity.
					STATIC ELECTRICITY Discover that friction produces a static charge.
					Test the charge of different materials with an electroscope.
					Predict which materials can be charged through friction.
					Explain that static electricity can have a positive or negative charge.
					Explain that lightning is a result of static electricity.
					ELECTRICAL CURRENT Demonstrate that electricity flows through a closed path (circuit).
					Understand that electrical circuits provide a means of transferring electrical energy when heat, light, sound and chemical changes are produced.
					Create parallel and series circuits.
					Create a closed circuit with a switch.
					Test objects/materials to identify them as conductors or insulators.
					Create a model that demonstrates how a light bulb works.
Motion and Force					Define work, force and energy.
					Identify and describe the simple machines: lever, wheel & axle, pulley and inclined plane.
					Understand that simple machines help us do work with less energy.
					Design a machine that incorporates two or more simple machines and performs a task.
					Identify Newton’s laws of motion and be able to apply through example.
					Explore the interactions of force and motion mathematically.
					Recognize that unbalanced forces acting on an object change the object’s speed and/or direction.
					Understand gravity as a force that pulls objects toward the earth and causes friction. (repeated in Forces of Nature)

Content	3	4	5	6	Grades 3-6 Diocesan Outcomes
					Develop definitions of work, force and energy.
					Understand the two forms of energy: potential and kinetic.
Force and Magnetism					MAGNETISM State how objects with like charges and objects with unlike charges affect one another.
					Understand that magnets attract and repel each other and certain kinds of other materials.
					Define magnetism
					Understand how magnetism is related to electricity.
					Predict, observe, and record magnetic properties of various materials.
					MAGNETS AND ELECTRICITY Understand how an electromagnet works.
					Construct a telegraph using an electromagnet
					Understand how to create temporary magnets.
Cells					Define cell using size, structure, function and needs
					Compare how cells in the body are alike and different

Life Science

Content	3	4	5	6	Grades 3 - 6 Diocesan Outcomes
Diversity of Organism					GENERAL Identify adaptations that allow plants and animals to survive in the various biomes: tundra, taiga, deciduous forest, tropical rainforest, grassland, and desert.
					Organization of Life - define tissues – organs – systems.
					Distinguish between plants and animals – classification of characteristics.
					PLANTS Explain why scientists classify living things.
					Distinguish between seed plants and non-seed plants based on one or more properties.
					Describe the structure and characteristics of flowering plants.
					Observe leaves of plants to distinguish between monocots and dicots.
					Identify the traits of deciduous trees and conifers.
					Name the two groups of living things that are neither plants nor animals.
					Transporting Materials - Identify the plant parts involved in transportation of materials.
					Transporting Materials - Describe the movement of water and minerals through a plant.
					Growth, Survival and Structure - Observe and describe the changes as a plant grows.
					Growth, Survival and Structure - Identify stimuli to which plants respond.
					Growth, Survival and Structure - Define and give examples of plant adaptations.
					Growth, Survival and Structure - Describe how people can cause plants to become extinct.
					Making and Using Food - Summarize & compare the photosynthesis and respiration.
					Reproduction and Growth - Label and explain the reproductive system of a flowering plant.

Content	3	4	5	6	Grades 3-6 Diocesan Outcomes
					Infer reasons why some plant offspring do not survive to become adults and reproduce.
Interdependence of Life					ANIMALS Describe traits common to all animals, as well as traits used for classification.
					List factors that all animals need to survive.
					Classify animals as vertebrae and invertebrate.
					Define species and habitat using examples.
					Transporting Materials - Identify how animals transport materials through the body.
					Transporting Materials - Describe the movement materials in simple animals vs. complex.
					Growth, Survival and Structure - Observe and describe the change vs. adaptation.
					Growth, Survival and Structure - Identify stimuli to which animals respond.
					Growth, Survival and Structure - Define and give examples of animals adaptations.
					Growth, Survival and Structure - Describe how people can cause animals to become extinct.
					Making and Using Food - Describe how animals obtain food and get energy through respiration.
					Reproduction and Growth - Describe the differences between sexual and asexual reproduction using examples.
					Reproduction and Growth - Infer reasons why some animal offspring do not survive to become adults and reproduce.
					ANIMALS List factors that all animals need to survive. (repeat)
					Define habitat. (repeat)
					Describe several animal habitats and their connection to behavior. (repeat)
					ENVIRONMENTAL (repeated in Earth Science – Earth process) Care for God’s creation through classroom recycling.
					Understand environmental concerns of pollution and endangered animals.
					Study factors that affect environments with a focus on aquatic and terrestrial environments.
					Observe the results when one factor is changed in an environment; draw conclusions from the change.
				Design an experiment to study the affects of various factors on an environment.	
				Understand and define the term “optimum environment.”	
				Understand and define the term “range of tolerance.”	
Heredity					The student will observe and differentiate between characteristics of organisms that are inherited and characteristics that are acquired.
					The student will identify similarities and differences between parent and offspring.
					Identify endangered plants and endangered animals.
					Observe and describe the change vs. adaptation (repeat)
					Identify stimuli to which animals respond. (repeat)
				Define and give examples of animals’ adaptations. (repeat)	

Content	3	4	5	6	Grades 3-6 Diocesan Outcomes
					Describe how people can cause animals to become extinct. (repeat)
					Compare the structure of fossils to one another and to living organisms. (repeat)
Flow of Matter and Energy					List producers and consumers in a food chain.
					Classify animals as herbivores, carnivores or omnivores.
					Summarize the process of photosynthesis. (repeat)
					Summarize the process of respiration. (repeat)
					Compare photosynthesis and respiration. (repeat)
Human Organism					GENERAL Define tissues- Describe how tissues form organs and organs form systems.
					Identify purposes of a skeleton/assemble a skeleton.
					Describe how muscles function.
					Demonstrate proper care for muscles.
					HUMAN BODY - Digestion Identify the cell as the smallest part of the body.
					Explain how a tissue differs from an organ.
					Recall why cells need food.
					Describe or model the process of digestion.
					HUMAN BODY - Circulation & Respiration List and understand functions of three parts of the circulatory systems.
					Describe the path followed by air as it moves through the respiratory system.
					NUTRITION Identify the five food groups.
					Classify food by the group to which they belong.
					Describe a balanced diet for an average fourth grader.
					DENTAL HEALTH Explain and label the parts of a tooth: crown, enamel, root, dentin, and pulp.
					Explain the function of each part of the tooth.
					Describe how plaque can harm teeth and gums.
					Explain how daily care, proper diet, and regular dental checkups can keep teeth and gums healthy
The Water Cycle, Weather and Climate					GENERAL WEATHER Understand that weather changes from day to day and over seasons.
					Describe the atmosphere using a model.
					Measure temperature with a thermometer.
					Define air pressure.
					Measure air pressure with a barometer.
					Explain causes of wind.
					Describe how an anemometer and a wind vane work.
					Describe the water cycle.
					Explain how rain forms.
					WATER ON EARTH Describe the amount of water that covers the earth's surface.
					Understand how water moves from one ocean to another.

Content	3	4	5	6	Grades 3-6 Diocesan Outcomes
					List sources of water pollution.
					Describe how lakes and ponds are formed.
					Describe how glaciers formed the Great Lakes.
					List two resources that come from the oceans.
					Explain how fresh water is produced from ocean water.
					Describe the three zones of ocean life.
					<i>Sample of a specific project - LAKE SUPERIOR– tie into life science</i>
					Be able to describe the different forms of water found on earth and give rough percentages of the quantities each form.
					Be able to describe one action students can do to preserve fresh water
					Be able to recognize that lake depth compared to its surface area. Surface area makes it susceptible to air born pollutants.
					Be able to connect different matter cycles to the land or water mass.
					Understand how glacier lakes are formed; describe how water moves through the great-lakes system.
					Understand the defining role that rivers play in watershed including the river drainage system and how drainage patterns in watershed are developed
					Understand the term ecosystem how the elements are interdependent.
					Understand the variety of animal camouflage when defining adaptation.
					Name and describe exotic species in the location and understand cause and effects of species introduction, as well as identify pros and cons in controlling exotic species.
					Be able to describe how bioaccumulation works

Earth and Space Science

Content	3	4	5	6	Grades 3-6 Diocesan Outcomes
Earth Structure and Processes					ROCKS and MINERALS
					Understand the processes involved in the formation of the three types of rocks.
					Classify rocks and minerals according to their observable characteristics.
					Conduct basic experiments to identify rocks and minerals.
					PLATE TECTONICS
					Identify and label the parts of the Earth.
					Compare and contrast the layers of the Earth.
					Infer that the continents were once joined.
					Understand that the Earth’s crust is broken into pieces called plates.
					Demonstrate and explain the consequences of plate movement.
					Communicate the dynamics of a volcanic eruption.
					Compare the relationship between volcanoes and earthquakes.
					ENVIRONMENTAL (repeated in Life Science – Interdependence)
					Study the factors that affect environments, with a focus on aquatic and terrestrial environments.
					Observe the results when one factor is changed in an environment; draw conclusions from the change.
					Design own experiment to study the affects of various factors on an environment.
					Understand and define the term “optimum environment.”
				Understand and define the term “range of tolerance.”	

Content	3	4	5	6	Grades 3-6 Diocesan Outcomes
The Universe					EARTH AND MOON
					Compare the sizes of the moon and the earth.
					Distinguish between <i>revolve</i> and <i>rotate</i> .
					Explain that the moon reflects sunlight.
					Infer that the phases of the moon are caused by movement, light and shadow.
					Record the phases of the moon for a given period of time.
					Evaluate the importance of telescopes in studying the moon.
					Describe three features of the surface of the moon.
					Infer why there is no life on the moon, based on the Apollo astronauts' exploration.
					Analyze the importance of future moon explorations.
					DISTANCES IN SPACE
					Define the term's <i>astronomical unit</i> and <i>light-year</i> .
					Select appropriate units for expressing distances between objects.
					STARS
					Define the term constellation.
					Identify and describe a well-known constellation.
					Identify two types of telescopes and explain when each can be used.
					Describe the use of a spectroscope in studying stars.
					List and describe factors affecting a star's magnitude.
					Describe the life cycle of a star.
					Define galaxy.
					Describe the Milky Way galaxy and the position of our solar system within that galaxy.
					Describe three main types of galaxies.
				Describe the "big-bang theory" of the origin of the universe; reconcile the theory with the Creation Story.	
				SPACE EXPLORATION	
				Describe how a rocket works.	
				Describe the main parts of a space shuttle.	
				Describe an artificial satellite.	
				List some uses of space stations	

**Diocese of Duluth
 Science Outcomes
 Grade 7 – 8**

All grades will explore the following science process skills in a variety of settings and with a variety of materials:

Scientific Process Skills

Observing	Recording data
Classifying	Inferring
Comparing	Predicting
Measuring	Decision making
Communicating	Experimenting
Organizing data	Controlling variables
Interpreting data	Formulating and testing hypothesis

Scientific method:

- Demonstrate how to solve problems and answer questions
- Understand what scientists do with their experimental data and how they interpret it
- Evaluate an experiment and develop a better plan for better results
- Use the Scientific International (SI) measurement system (metric system).
- Use charts, graphs and pictures to understand and explain scientific findings.
- Communicate scientific findings.
- Given a problem, form a hypothesis, design and conduct an experiment, communicate the results of the experiment, and ask further questions for future investigations.
- Complete a formal lab write-up

Life Science

Content	7	8	Grade 7 & 8 Diocesan Outcomes
Cells			Understand that cells are building blocks, the basic unit of life.
			Describe cell organelles, the structure and function of each for specific processes like mitosis and meiosis, photosynthesis and respiration and protein synthesis
			Use a microscope to study cells.
			Use the microscope to investigate real cells; compare and contrast plant and animal cells.
			Use computer technology to understand and explain cells using analogies.
			Observe own cheek cells under the microscope; draw and label them.
			Observe an onion epidermis under the microscope; draw and label it.
			Describe the products of cells, the compounds cells make, and how cells are life on a microscopic level.
			Describe how our bodies use organic molecules to convert into usable products like organelles and energy
			Understand the relationship cell→tissue→organ→system→organism
			Understand the importance of specialization and describe using specific examples of specialized cells.
Diversity of an Organism			Explain that individuals are composed of specialized cells, tissues, organs and organ systems that perform specialized functions.
			Recognize that an organism’s body plan and its ability to regulate its internal environment enable it to make or find food, grow and reproduce in a constantly changing environment.

Content	7	8	Grade 7 & 8 Diocesan Outcomes
			Recognize that behavioral responses of organisms may be determined by heredity and past experience.
			Use and create dichotomous keys.
			Use the characteristics of an organism to identify the kingdom to which it belongs.
Interdependence of Life			Define terms such as population, community, ecosystem, and biosphere.
			Identify, through example, the differences between biotic and abiotic factors
			BIOMES
			Identify factors that determine where organisms can survive.
			Distinguish between weather and climate.
			Describe the climate and other characteristics of various biomes: tundra, taiga, deciduous forest, tropical rainforest, grassland, and desert: compare and contrast various biomes.
			POLLUTION
			Identify various causes of air, land and water pollution.
			Explain the effect of air, land and water pollution on living things.
			Identify methods of reducing air, land and water pollution.
Heredity			Recognize that inherited traits result from information contained in genes, which are located on chromosomes of each cell.
			Recognize that each gene carries a single unit of information and can influence more than one trait.
			Explain how inherited traits can be determined by one or many genes.
			Comprehend that interactions with the environment affect some inherited traits.
			Comprehend that reproduction is essential for the continuation of a species.
			Compare and contrast the advantages and disadvantages of sexual and asexual reproduction.
Biological Changes Over Time			Recognize extinction is a common event.
			Describe how the fossil record documents the appearance and diversification of many life forms.
			Explain how biological adaptations in structure, function and behavior enhance the reproductive success and survival of a species in a particular environment.
			Recognize that scientific evidence can be used to infer common ancestry among some organisms.
			Explain how diversity of species develops through gradual processes over generations.
Flow of Matter and Energy			Know that plants use the energy in light to make sugars out of carbon dioxide and water.
			Explain how energy is transferred through food chains and food webs in an ecosystem.
			Explain how the amount of useable energy available to organisms decreases as it passes through a food chain and/or food web.
			Know that the total amount of matter in a closed system remains the same as it is transferred between organisms and the physical environment even though its location or form changes.

Content	7	8	Grade 7 & 8 Diocesan Outcomes
			Compare and contrast predator/prey, parasite/host and producer/consumer/decomposer relationships.
Human Organism			Define the term tissues and identify the four types and their characteristics.
			Describe the structure and function of the skeletal system, including bone marrow, cartilage, and bone structure.
			Describe the types and functions of joints.
			Describe the types, structure and functions of muscles.
			The student will describe the structure and function of systems for digestion, respiration, reproduction, circulation, excretion, movement, control and coordination and for protection from disease, in the human organism.
			Specifically - explain the parts of each system. Describe the function of each organ, how nutrients and materials are circulated and absorbed into the body, and how waste is circulated and expelled.
			Understand the causes and prevention of cardiovascular disease.
			Describe 2, 3, and 4-chambered hearts, the electrical system of the heart, blood pressure, heart rate, and pulse.
			Describe the circulatory and respiratory system, including the anatomy of the heart, systematic and pulmonary circuit, blood vessels, blood components, and gas exchange.

Earth and Space Science

Content	7	8	Grade 7 & 8 Diocesan Outcomes
Earth Structure and Processes			GEOLOGY
			Understand a geologic timeline, the concept of time, how old the earth is, and how scientists have determined this.
			Understand that rocks are formed by magma, but can undergo change.
			Describe the three types of rocks.
			Identify unknown rocks.
			Describe what rocks are made of, qualities of rocks, and crystal structure.
			Describe six characteristics of minerals.
			Study cave formation and the structures that exist inside of caves.
			Understand how carbon-14 dating works and why it doesn't work all the time.
			Study fossils and types of fossils.
			Use index fossils to estimate ages of rocks.
			PLATE TECTONICS
			Describe plate tectonics: how it works and how it affects geological activity.
			Understand convection heating and indirect evidence.
			Describe the proof Alfred Wegner had for the theory of continental drift.
			Study a map of plate boundaries and history of earthquake activity.
			Understand epicenter, focus, seismic waves and the kinds of destruction they cause.
			Understand how earthquakes work and the devastating outcomes of earthquakes.
			Describe how buildings can be earthquake proofed.
			Describe how a volcano works, and what causes them to erupt.
			Locate the "ring of fire" where volcanoes form.

Content	7	8	Grade 7 & 8 Diocesan Outcomes
			Understand how hot spots create islands.
			Understand the significance of crust mantle, outer core, inner core, lithosphere & atmosphere, trenches & subduction.
			Explain how convection currents in the mantle cause plate tectonic motion.
			Understand convergent, divergent, and transform boundaries.
			Identify the parts of a volcano: chamber, pipe, side vent, vent.
			Identify volcanic landforms: batholiths, sill, dike, and volcanic neck.
			Describe the difference between shield volcanoes, composite volcanoes, and cinder cone volcanoes.
			EARTH PROCESSES
			Define weathering and erosion; describe their role in shaping the planet.
			Define differentiated erosion.
			Research processes that shape the planet and present findings.
The Water Cycle, Weather and Climate			METEOROLOGY
			Explain air masses and fronts and how they affect weather, including terms such as convection and conduction.
			Identify types of storms and describe how they are created.
			Use meteorological maps to forecast weather.
			Explain air pressure and its affect on weather.
			Understand and use instruments associated with meteorological measurements (e.g., barometer)
			Identify the types of clouds.
The Universe			ASTRONOMY
			Explain the difference between rotation and revolution.
			Understand what causes the change of seasons on earth.
			Use the predictability of the motions of the Earth, and sun to explain the length of day, length of year, phases of the moon, eclipses, tides and shadows.
			Identify the planets and the main characteristics of each.
			Define and compare comets, meteors, and asteroids.
			Understand the characteristics of the sun and its role in the solar system.
			Understand how light travels.
			Define spectroscopy.
			Understand the stages in the life of a star (e.g., dwarf, red giant, super giant, white dwarf).
			Classify stars using the Hertzsprung Diagram.
			Describe the competing theories regarding the origin of the universe.