

Physical Science

KINDERGARTEN

- **Introduce** sorting objects by observable properties **(PS1)**
 - Size
 - Shape
 - Color
 - Weight
 - Texture
- **Introduce** identifying objects and materials **as: (PS2)**
 - Solid
 - Liquid
 - Gas
- Introduce the various way objects can move **(PS3)**
 - Straight line
 - Zigzag
 - Back-and-forth
 - Round-and-round
 - Fast
 - Slow
- Introduce the concept of volume **(Doesn't get reinforced, doesn't show until 6th grade)**
- Introduce the effect of light and shadow **(DIO)**
- Introduce the effect of light and angle on the image detected in a mirror **(DIO)**

Physical Science

GRADE 1

- Reinforce sorting object by observable properties (PS1)
 - Size
 - Shape
 - Color
 - Weight
 - Texture
- Introduce recording findings by:
 - Classifying
 - Graphing
 - Reporting data
- Reinforce identifying objects and materials (PS2)
 - Solid
 - Liquid
 - Gas
- Reinforce the movement of objects and describe the various ways (PS3)
 - Straight line
 - Zigzag
 - Back-and-forth
 - Round-and-round
 - Fast
 - Slow
- Introduce that under some conditions objects can be balanced (PS5)
- Introduce simple tools:
 - Levers
 - Screw
 - Pulley
 - Wheel
 - Incline plane
- Introduce the effect a prism has on light. (needs to be reinforced- doesn't show until Grade 5)

Physical Science

GRADE 2

- Observable Properties of Objects
 - Reinforce sorting objects by observable properties such as: (PS1)
 - Size
 - Shape
 - Color
 - Weight
 - Texture
 - Reinforce recording findings and present data in a graphic format
- States of Matter (PS2)
 - Reinforce identifying objects and materials as:
 - Solid
 - Liquid
 - Gas
 - Introduce that solids have a definite shape and that liquids and gases take the shape of their container. (PS2)
- Position and Motion of Object
 - Introduce that the way to change the motion of an object is to apply force (give it a push or pull). The greater the force, the greater the change in the motion of the object. (PS4)
- Forms of Energy
 - Introduce the basic forms of energy (PS4 3-5)
 - Light
 - Sound
 - Heat
 - Electrical
 - Magnetic
 - Introduce that energy is the ability to cause motion or create change. (PS4 3-5)
- Introduce the concept of gravity.

Physical Science

GRADE 3

- Properties of Objects and Materials (PS1)
 - **Master** differentiating between properties of objects and:
 - Size
 - Shape
 - Weight
 - Properties of materials
 - Color
 - Texture
 - Hardness (**never introduced ?**)
- Forms of Energy
 - Introduce the concept of stored (potential) and energy of motion (kinetic)
 - **Reinforce** the forms of energy and their sources (PS2)
 - Light
 - Sound
 - Heat
 - Electrical
 - Magnetic
 - Solar (**never introduced ?**)
 - Nuclear (**never introduced ?**)
- Electrical Energy
 - **Introduce** that electricity in circuits requires a complete loop through which an electrical current can pass, and that electricity can produce light, heat, and sound. (PS6)
 - **Introduce** identifying and classifying objects and materials that conduct electricity and objects and materials that are insulators of electricity. (PS7)
 - **Introduce** how electromagnets can be made, and give examples of how they can be used. (PS8)
- Magnetic Energy
 - **Introduce** that magnets have poles that repel and attract each other. (PS9)
 - Identify and classify objects and materials that a magnet will attract and objects and materials that a magnet will not attract. (**master**) (PS10)
- Work and Force
 - Reinforce the concept of gravity
 - Introduce the concept of friction and its effect on objects in motion.

Diocesan- compass?

Physical Science

GRADE 4

- States of Matter
 - **Reinforce** comparing and contrasting solids, liquids and gases based on the basic properties of each of these states of matter. (PS2)
 - **Introduce** how water can be changed from one state to another by adding or taking away heat. (PS3)
 - **Introduce** differentiating between weight and mass.
 - **Introduce** the relationship between the volume and mass (density) of an object.
- Forms of Energy
 - **Reinforce** identifying the basic forms of energy
 - Light
 - Sound
 - Heat
 - Electrical
 - Magnetic
 - **Solar- introduced in 3rd**
 - **Nuclear introduced in 3rd**
 - **Reinforce** that energy is the ability to cause motion or create change. (PS4)
 - **Introduce** examples of how energy can be transferred from one form to another. (PS5)

Diocesan- Sir Isaac Newton, pendulums, plastics

Physical Science

GRADE 5

- Wave Energy
 - **Introduce** the basic properties of a wave.
 - **Introduce** differentiating between a mechanical and electromagnetic wave.
- Sound Energy
 - **Introduce** that sound is produced by vibrating objects and requires a medium through which to travel. **(PS11)**
 - **Introduce** the basic properties of a sound wave:
 - Pitch
 - Wavelength
 - Amplitude
 - Volume
 - Timbre
 - **Introduce** relating the rate of vibration to the pitch of the sound. **(PS11)**
- Light Energy
 - **Introduce** that light travels in a straight line until it strikes an object or travels from one medium to another. **(PS12)**
 - **Introduce** that light can be reflected, refracted and absorbed. **(PS12)**
- Energy Resources
 - **Introduce** the properties of fossil, hydroelectric and nuclear fuels.

Diocesan- energy resources: fossil fuels, hydroelectric, nuclear
Heat energy?

Physical Science

GRADE 6

- Properties of Matter
 - Reinforce differentiating between weight and mass. (PS1)
 - Introduce that weight is the amount of gravitational pull on an object. (PS1)
 - Reinforce differentiating between volume and mass. (PS2)
 - Introduce density (PS2)
 - Introduce that the measurement of volume and mass require understanding of the sensitivity of measurement tools and the knowledge and appropriate use of significant digits. (PS3)
 - Rulers
 - Graduated cylinders
 - Balances
 - Introduce how mass is conserved in a closed system. (PS4)
 - Melt
 - Dissolve
 - Precipitate various substances to observe examples of conservation.
 - Introduce basic atom structure and its smaller particles (DIO)
 - Neutrons
 - Protons
 - Electrons
 - Introduce that the motion of matter determines the state of that matter and vice versa
 - Introduce and measure density, boiling point, melting point, solubility and simple chemical properties of pure substances
- States of Matter
 - Solids
 - Reinforce properties of a solid
 - Introduce molecular structure of a solid
 - Liquid
 - Reinforce properties of a liquid
 - Introduce molecular structure of a liquid
 - Gas
 - Reinforce properties of a gas
 - Introduce molecular structure of a gas
- Elements, Compounds and Mixtures
 - Introduce that there are more than 100 elements that combine in a multitude of ways to produce compounds that make up all of the living and nonliving things that we encounter. (PS5)

- **Introduce** differentiating between an atom (the smallest unit of an element that maintains the characteristics of that element) and a molecule (the smallest unit of a compound that maintains the characteristics of that compound). (PS6)
- **Introduce** basic examples of elements and compounds. (PS7)
- **Introduce** differentiating between mixtures and pure substance. (PS8)
- **Introduce** that a substance (element or compound) has a melting point and a boiling point, both of which are independent of the amount of the sample. (characteristic property) (PS9)
- **Introduce** differentiating between physical changes and chemical changes. (PS10)

- **Motion and Forces**
 - **Introduce** various types of simple and compound machines
 - **Introduce** the use of simple machines to accomplish task in everyday life (levers, pulleys, wheels and axles, screws and wedges)

- **Acids and bases (remove- grade 7)**
 - **Introduce** the concept of pH.

- **Forms of Energy- (removed from 7th- taught in 6th)**
 - **Differentiate** between potential and kinetic energy. (PS13)
 - **Identify** situation where kinetic energy is transformed into potential energy and visa versa. (PS13)

- **Physical Energy**
 - **Reinforce** the basic forms of energy
 - **Introduce** that energy cannot be created or destroyed but can be changed from one form to another
 - **Introduce** the requirement of energy for all physical and chemical changes
 - **Introduce** heat energy movement (Conduction, convection and radiation)
 - **Introduce** light's interaction with matter
 - **Introduce** that the sun's energy is a major source of change on the earth's surface
 - **Introduce** different forms of electromagnetic energy from the sun

Physical Science

GRADE 7

- Motion of Objects
 - **Introduce** how the motion of an object can be described by its position, direction of motion and speed. (PS11)
 - **Introduce** graphing and interpreting distance vs. time graphs for constant speed. (PS12)
 - Introduce Newton's three laws of motion.
 - Introduce the concept of momentum.
- **Forms of Energy- remove taught in 6th**
 - Differentiate between potential and kinetic energy.
 - Identify situation where kinetic energy is transformed into potential energy and visa versa.
- **Physical Energy**
 - Introduce forms of energy (electrical and mechanical)
 - Introduce differentiating between renewable and non-renewable energy
 - Introduce the conversion of electrical energy to light, heat, sound, chemical or other forms of energy
- **Motion and Forces**
 - Introduce balanced and unbalanced forces (unbalanced= motion)
 - Introduce using mathematics to describe the motion of objects: speed, distance, time, acceleration and momentum
- **Mechanical Energy**
 - Introduce the concept of mechanical advantage.
- **Periodic Table of Elements**
 - Define an element
 - Atomic number
 - Atomic mass
 - Organization of the periodic table.
- **Matter**
 - Introduce acids and bases (removed from grade 6)
 - Introduce the concept of pH.
 - Introduce comparing and contrasting elements, compounds and mixtures
 - Introduce comparing different types of mixtures
 - Introduce different types of solutions (Colloids and suspensions)

Diocesan- inertia and motion

Physical Science

GRADE 8

- Heat Energy
 - **Introduce** that heat is a form of energy and that temperature change results from adding or taking away heat from a system (PS14)
 - **Introduce** the effect of heat on particle motion through a description of what happens to particles during a change in phase.
 - **Introduce** examples of how heat moves in predictable ways, moving from warmer objects to cooler ones until they reach equilibrium.
- Reinforce the Law of Conservation of Matter
- Introduce the Law of Conservation of Energy
- Nuclear Energy
 - Reinforce atomic structure.
 - Introduce nuclear fission and nuclear fusion.
 - Introduce the Law of Conservation of Matter and Energy.
- Introduce Archimedes's Principle.
- Introduce Bernoulli's Principle.
- **Physical Energy**
 - **Introduce that heat is a by-product of energy transformation (e.g. biological, mechanical, geological)**
 - **Introduce comparing and contrasting the efficiency and effects of different forms of energy (i.e. solar, fossil fuels, wind, nuclear)**
- **Motion and Forces**
 - **Introduce and compute how machines can provide mechanical advantage in producing motion**
- **Matter**
 - **Introduce the differences between a physical and chemical change**
 - **Introduce balancing chemical equations as way of demonstrating conservation of matter**
 - **Introduce combination of substances (ionic and covalent bonding)**

Life Science

KINDERGARTEN

- **Introduce the difference** between living and non-living things. (LS2)
 - Group living and non-living things according to the characteristics that they share.
- **Introduce** that plants have life cycles. (LS3)
 - Conduct simple experiments of planting seeds to see how they grow into plants.
- **Introduce** that animals have life cycles. (LS4)
 - Birth
 - Growth
 - Reproduction
 - Death
 - **Introduce the concept of metamorphosis using the frog life cycle as a model.**
(remove)
- **Introduce** the ways in which an animal's habitat provides for its basic needs (food, water, air and shelter.) (LS8)
 - Identify zoo and farm animals.
 - Explain the concept of habitat.
 - Correctly place an animal into its appropriate habitat.
 - Explain how an animal's habitat provides for its basic needs (food, water, air, shelter).
- **Introduce the ways in which a plant's habitat provides for its basic needs (nutrients, water, air and light.) (LS8)**
- Introduce the names for external body parts.
- Introduce the skeletal and systems.
- Introduce the five senses.
- **Introduce how to maintain healthy teeth**

LS1-Recognize that animals (including humans) and plants are living things that grow, reproduce, and need food, air, and water- introduce in Kindergarten, reinforce in 1st, master in 3rd?

LS6- Recognize that people and other animals interact with the environment through their senses of sight, hearing, touch, smell, and taste

Health Science

KINDERGARTEN

- **Introduce the importance of breakfast (DIO)**
- Introduce dental hygiene.
- Introduce personal safety information
 - Address and Phone number
 - Stranger danger
 - Asking for help/911
 - Name persons and community helpers (such as police officers, fire fighters, and emergency personnel) who can be contacted to help with health, safety and injury prevention and describe the appropriate procedures for contacting health care personnel in an emergency.
- Introduce Fire safety
 - School evacuation:
 - Identify safe meeting place at school and practice fire drills frequently.
 - Home evacuation and meeting place:
 - Identify ways out of home and identify safe meeting place.
- Introduce Weapon Safety
 - School safety
- Introduce Bicycle Safety
 - Helmets
 - Road Safety
- Introduce Car Safety
 - Seat belts
- Introduce rules for playground safety
- Introduce self protection
 - Distinguish among safe, unsafe and inappropriate touch
 - Demonstrate the use of assertive behavior, refusal skills, and actions intended for personal safety.

Life Science

GRADE 1

- Introduce ways in which any plants and animals closely resemble their parents in observed appearance. (LS4)
 - Explain the concept of domestic vs. wild animal
 - Learn how animals help and benefit humans
 - Discuss the similarities and differences between animals.
 - Discuss characteristics of:
 - Mammals
 - Birds
 - Fish
 - Amphibians
 - Reptiles
 - Insects
 - Correlate these characteristics with those of adult animals showing genetic link between parent and offspring.
- **Reinforce** that animals (including humans) and plants are living things that grow, reproduce and need food, air, water, and shelter (needs of life).
 - Explain that all animals have basic survival instincts that enable them to meet their basic needs for food, air, water, and shelter.
 - Learn that all animals grow, develop, and reproduce (characteristics of life).
- **Introduce** an ecosystem
 - **Reinforce** that there are living and non-living components in an ecosystem.
 - Introduce the concept of ecosystem using the rainforest as a model.
- Introduce basic plant anatomy using the following anatomical parts (LS2 3-5)
 - Roots
 - Stem
 - Leaves
 - Flowers
 - Describe the basic function of the above mentioned structures.
- Reinforce the 5 senses.
- Introduce the skin, digestive, excretory and nervous systems.
- Introduce the structure of a human tooth.
- **Introduce how to maintain healthy teeth**
- Identify the key nutrients in food that support healthy body systems and recognize the amount of food needed changes as the body grows.
- Introduce the food pyramid.

Health Science

GRADE 1

- **Reinforce** Personal Safety Information
 - address and phone number
 - Stranger danger
 - Asking for help/911
 - Name persons and community helpers (such as police officers, fire fighters and emergency personnel) who can be contacted to help with health, safety and injury prevention and describe the appropriate procedures for contacting health care personnel in an emergency.
- Reinforce Fire Safety
 - School evacuation
 - Home evacuation and meeting place.
- **Reinforce Weapon Safety (DARE)**
 - School safety officer
- **Reinforce Bicycle Safety (DARE)**
 - Helmets
 - Road safety
- **Reinforce Car Safety (DARE)**
 - Seat belts
- Reinforce Playground Safety (rules) (DARE-remove)
- **Reinforce Self protection (DARE)**
 - Distinguish among safe, unsafe and inappropriate touch
 - Demonstrate the use of assertive behavior, refusal skills, and actions intended for personal safety.

Life Science

GRADE 2

- **Introduce** that fossils provide us with information about living things that inhabited the earth years ago. **(LS5)**
 - Define fossils
 - Explain that dinosaurs lived long ago and left a record of their existence through fossils.
 - Introduce the concept of extinct and endangered species.
 - Discuss that extinction of species continues to occur.
- **Reinforce** recognizing changes in appearance that animals and plant go through as the season change. **(LS7)**
 - Define the anatomical structures of a tree.
 - Using trees as a model observe and record changes in plants.
 - Reinforce the concept of habitats for plants and animals.
 - Introduce the concept of changes in habitats.
 - Introduce the animal classes:
 - Insects
 - Amphibians
 - Reptiles
 - Birds
 - Mammals
- Human growth and development
 - Reinforce bones and the muscular system
 - **Reinforce** digestion
 - Introduce the heart, lungs.
- **Introduce** and discuss the function of the 3 tooth types
- **Reinforce** how to maintain healthy teeth.
- Introduce the concept of wellness
 - Physical
 - Mental
 - Self-Esteem
- **Introduce the concept of universal precautions for all first aid involving any blood and other body fluids. (remove)**
- **Apply appropriate first aid for all cuts and bruises, including observing universal precautions. (remove)**

Health Science

GRADE 2

- **Reinforce** Personal Safety Information
 - Reinforce and master: address and telephone number.
 - Master stranger danger
 - Master asking for help/911.
 - Reinforce the name of persons and community helpers (such as police officers, fire fighters, and emergency personnel) who can be contacted to help with health, safety, and injury prevention and describe the appropriate procedures for contacting health care personnel in an emergency.
- **Reinforce** Fire safety
 - School evacuation
 - Home evacuation and meeting place.
- **Weapon safety**
 - **School safety officer**
- **Reinforce** Bicycle Safety
 - Helmets
 - Road safety
- **Reinforce** Car safety
 - Seat belts reinforced
- **Reinforce** Playground safety (rules) reinforced
- **Reinforce** Self protection
 - Distinguish among safe, unsafe, and inappropriate touch (**to a degree in religion-respecting our body**)
 - Demonstrate the use of assertive behavior, refusal skills, and actions intended for personal safety.

Life Science

GRADE 3

- Identify the structures in plants that are responsible for food production, support, water transport, reproduction, growth, and protection (LS2)
 - Reinforce identifying and describing the function of the following parts of a plant
 - Leaves
 - Flowers
 - Stem
 - Bark
 - Wood
 - Introduce identifying and describing the function of the following parts of a plant
 - Vascular systems (roots, xylem and phloem)
 - Introduce classifying plants as cone bearing or seed bearing. (LS3)
 - Introduce, define and observe the difference between a dicot and monocot.
- Classifying animals based on physical characteristics (LS3)
 - Introduce vertebrate vs. invertebrate
 - Introduce warm-blooded vs. cold-blooded.
 - Introduce egg-bearing vs. live-bearing.
 - Reinforce the major animal classes:
 - Insects
 - Amphibians
 - Reptiles
 - Birds
 - Mammals
- Reinforce the concept that plants and animals go through predictable life cycles that included birth, growth, development, reproduction and death. (LS3) (master) reinforce in 4th
- Introduce the major stages that characterize the life cycle of the butterfly as it goes through metamorphosis. (LS4)
 - Describe the following stages:
 - Egg
 - Larvae
 - Pupa
 - Adult
- Reinforce the basic needs of all living things (food, water, air, shelter).
- Introduce the concept of habitat.
 - Introduce the concept of migration (LS9)
 - Discuss example of how changes in the environment may result in some plants and animals moving location (migration) to ensure their survival. (LS7)
- Introduce animal adaptation.
 - Introduce camouflage and mimicry as protective adaptations. (LS6)

- Introduce food chains and food webs.
 - Explain that all living things derive their energy directly or indirectly from the sun.
 - Describe how energy from the sun is used by plants to produce sugars (photosynthesis). (LS11)
 - Define the term producer (plants) explain that all food chains begin with a plant and that the energy from the sun is transferred within a food chain. (LS11)
 - Describe how the sun's energy is transferred from producers (plants) to consumer to decomposers. (LS11)
 - Introduce the terms: (reinforce)- remove
 - Herbivore
 - Carnivore
 - Omnivore
 - Discuss the impact on a food chain or web if a link in the chain is broken.
- Reinforce the skeletal, muscular, circulatory, and respiratory systems

Mass Frameworks #10 missed: Introduce examples of how organisms can cause changes in their environment to ensure survival. Explain how some of these changes may affect the ecosystem.

Diocesan: using cuttings to grow plants; mold spores; earthworms; endangered animals and ways to protect

Health Science

GRADE 3

- Identify tooth functions and causes of tooth health and decay and apply proper dental health skills (choosing healthy tooth snacks, brushing, flossing).

*** Introduce in Kindergarten and reinforce in Grades 1-4 ***

- Personal Safety Information
 - Address and phone number
 - Stranger danger
 - Asking for help/911
 - Name of persons and community helpers (such as police officers, fire fighters, and emergency personnel) who can be contacted to help with health, safety and injury prevention and describe the appropriate procedures for contacting health care personnel in an emergency.
- Fire Safety
 - School evacuation
 - Home evacuation and meeting place.
- Weapon safety
 - School safety officer
- Bicycle Safety
 - Helmets
 - Road safety
- Car safety
 - Seat belts
- Playground Safety (rules)
- Self protection
 - Distinguish among safe, unsafe, and inappropriate touch
 - Demonstrate the use of assertive behavior, refusal skills, and actions intended for personal safety.

Diocesan:: explore inherited traits, digestive system

Life Science

GRADE 4

- Differentiate between vascular and non-vascular plants (LS1)
 - Reinforce and master describing the advantage of having a vascular system.
 - Reinforce why the development of a vascular system allowed for the increase in usable habitat.
- Reinforce the concept that plants and animals go through predictable life cycles that include birth, growth, development, reproduction, and death. (LS3)
- Introduce the life cycle of a plant
 - Explore the difference forms of reproduction utilized by vascular vs. nonvascular plants (reinforce).
 - Sexual and asexual stages.
 - Examine the reasons and advantages due to the production of cones and seeds. (adaptations (reinforce and master)
- Reinforce plant behaviors, such as the way seedlingsøstems grow toward light and their roots grow downward in response to gravity. (adaptations) (LS9)
- Adaptations of living things
 - Reinforce and master how changes in the environment (drought, cold) have caused some plants and animals to die or move to new locations (migration) (LS7)
 - Reinforce that many plants and animals can survive harsh environment because of seasonal behaviors, e.g. in winter, some trees shed leaves, some animals hibernate, and other animals migrate. (LS9)
- Reinforce that some animal behaviors are instinctive (e.g. turtles burying their eggs) and others are learned, (e.g. humans building fires for warmth, chimpanzees learning to use tools). (LS8)

Diocesan: parts of flower (plant in 3rd); photosynthesis; food chain; insects life cycle; introduce ecosystems; plants: edible/nonedible, seed/non-seed

Health Science

GRADE 4

- Reinforce how organisms can cause changes in their environment to ensure survival. Explain how some of these changes may affect the ecosystem.
- Reinforce the skin, digestive, excretory, and nervous system.
- Reinforce how the body fights germs and diseases naturally and with medicines and immunizations.
- Reinforce the common symptoms of illness and recognize that being responsible for individual health means alerting caretakers to any symptoms of illness.
- Reinforce skills to prevent and control the spread of disease, including those that help promote cleanliness.
 - Correct hand washing.
 - Regular bathing.
 - Washing clothes.

*** Introduce in Kindergarten and reinforce in Grades 1-4 ***

The following skills will be master by Grade 4

- Personal Safety Information
 - Address and phone number
 - Stranger danger
 - Asking for help/911
 - Name persons and community helpers (such as police officers, fire fighters, and emergency personnel) who can be contacted to help with health, safety, and injury prevention and describe the appropriate procedures for contacting health care personnel in an emergency.
- Fire Safety
 - School evacuation.
 - Home evacuation and meeting place.
- Weapon Safety
 - School safety officer
- Bicycle Safety
 - Helmets
 - Road Safety
- Car safety
 - Seat belts
- Playground Safety (rules)
- Self protection

- Distinguish among safe, unsafe, and inappropriate touch
- Demonstrate the use of assertive behavior, refusal skills and actions intended for personal safety.

Diocesan: stages of human development

Life and Health Science

GRADE 5

- **Introduce** the characteristics of life
 - Definition of an organism.
 - Obtain and use energy (review food chains).
 - Differentiate between an adaptation and a response.
 - Give examples of how inherited characteristics may change over time as adaptations to changes in the environment that enable organisms to survive. (e.g. shape of beak or feet, placement of eyes on head, length of neck, shape of teeth, color.) **(LS6)**
 - Respond to the environment.
 - Stimulus and response
 - Describe how organisms meet some of their needs in an environment by using behaviors (patterns of activities) in response to information. (stimuli) **(LS8)**
 - **Reproduce remove to 8th grade**
 - **Asexual vs. sexual**
 - **Made of one or more cells**
 - **All cells come from pre-existing cells**
 - Grow and develop
 - Reinforce life cycles
- The needs of living things
 - Food
 - Different modes of obtaining food
 - Eat
 - Photosynthesis
 - Chemosynthesis
 - Energy
 - Directly or indirectly all energy comes from the sun
 - Water
 - Living space
 - Competition
 - Gas exchange
 - Not the same for all organisms
 - Temperature regulation
 - Exothermic
 - Endothermic
- Classification of living things **(LS1 Gr.6-8)**
 - 6 Kingdoms
 - Common characteristics in reference to cell type, singular of multi-cellular, reproduction, food acquisition, examples.
 - Vertebrate vs. Invertebrate

- Organization of living things
 - Cell, tissue, organ, organ system, organism (LS 5 gr. 6-8)
- Introduce the 11 major systems of the human. (LS 6 gr. 6-8)
 - Skeletal, muscular, integumentary, digestive, nervous, circulatory, excretory, reproductive, immune, endocrine, respiratory.
 - System, major function, example of organ.
- Plant and Animal cells (remove to 8th grade)
 - Differentiate between plant and animal cell
 - Define the term organelle
 - List and describe the function of the following organelles: nucleus, nuclear membrane, cell membrane, cell wall, cytoplasm, endoplasmic reticulum (rough and smooth), Golgi body, lysosome, mitochondria, vacuole, and chloroplast.
 - Recognize within cells, many of the basic functions of organisms are carried out. The way in which cells function similar in all living organisms.
 - Extracting energy from food
 - Getting rid of waste
 - Differentiate between prokaryotic and eukaryotic cells
- Human Cells: Nerve, Muscle, Blood and Skin
 - Discuss form following function.
- The Human Ear
 - General anatomy (auditory canal, tympanic membrane, hammer, anvil, stirrup, semicircular canals, cochlea, and auditory nerve).
 - Function of the human ear
 - Hearing
 - Balance
- Medicine, drugs, and the process of addictions (DARE)
- Identify the food groups which are important to good health
 - SHS Nurse (health)

- Simple organisms
 - Protist
 - Algae (move from 6th)
 - Characteristics of algae
 - Dinoflagellates
 - Diatoms
 - Euglenas
 - Green Algae
 - Brown Algae
 - Red Algae

Diocesan: Addiction; aerobic exercise; stress reduction; Darwin;s Theory of Natural Selection

Life and Health Science

GRADE 6

- Skeletal System
 - Differentiate between axial and appendicular skeletons.
 - Differentiate between ecto and endo skeletons. (remove)
 - 5 Major functions
 - Support
 - Protection of internal organs
 - Muscle attachment
 - Calcium and phosphorus storage
 - Blood cell formation (hematopoietic stem cells)
 - Name and locate the 21 major bones of the human skeleton (cranium, maxilla, mandible, humerus, ulna, radius, attached and floating ribs, sternum, xyphoid process, clavicle, scapula, carpals, metacarpals, phalanges, pelvis, femur, tibia, fibula, tarsals, metatarsals, vertebral column including 5 sections, cervical (atlas and axis), thoracic, lumbar, sacrum and coccyx).
 - Introduce the 4 major types of bones:
 - Short
 - Long
 - Flat
 - Irregular
 - Introduce immovable and movable joints
 - Introduce the 4 types of movable joints:
 - Ball and socket
 - Hinge
 - Gliding
 - pivot
 - Describe the gross and microanatomy of a long bone. (remove)
 - Explain the function and relationship between osteoblasts and osteoclasts. (remove)
 - Types and function of soft skeletal tissues (cartilage, tendons, ligaments).remove
 - Describe a fracture and discuss the major types: remove
 - Greenstick
 - Spiral
 - Compound
- Muscular System
 - Major functions of the muscular system
 - Protection
 - Movement
 - Structure
 - Muscle structure

- Muscle, bundle of muscle fibers, muscle fiber (cell), actin and myosin
 - Describe the three types of muscle tissue. Compare structure and give examples of each type.
 - Skeletal
 - Cardiac
 - Smooth
 - Name the major skeletal muscles of the human (temporalis, sternocleidomastoid, masseter, obicularis oculii, pectorals, oblique abdominis, rectus abdominis, biceps, triceps, deltoid, sartorius, hamstrings, quadriceps, tibialis, and gastronemius). (Remove)
 - Define the 3 types of lever systems (first, second, and third class) and give examples of each in the human body (remove)
- Integumentary System
 - Functions
 - Protection
 - Defense against disease
 - Aiding and keeping the body hydrated
 - Body temperature regulation
 - Describe the 2 major layers of the skin:
 - Epidermis
 - Dermis
 - Describe the structures found within the dermis and their functions (oil glands, sweat glands, sense receptors (heat, pressure, pain), hair follicles, blood vessels)
 - Skin pigmentation (melanin)
- Molecules of Life (move to 8th)
 - Protein and amino acids
 - Carbohydrates
 - Lipids
 - Nucleic acids, DNA, RNA
- Movement of Substances (move to 8th)
 - Osmosis
 - Diffusion
 - Active transport
- Standard first aid and personal safety
 - School Nurse
- Living things and their environment
 - Define biosphere and the 3 major components:
 - Hydrosphere
 - Lithosphere
 - Atmosphere
 - Hierarchy within the biosphere:
 - Individual
 - Population
 - Community
 - Ecosystem
 - Biome

- Biosphere
- Define ecosystem
 - Biotic vs. abiotic components
- Give examples of ways in which organism interacts and have different functions (niche) within an ecosystem which allow the ecosystem to survive.
- Energy and Living things
 - Explain the roles and relationships between producers, consumers and decomposers in the process of energy transfer in a food web (food chains, food webs and energy pyramid)
 - Explain how dead plants and animals are broken down by other living organisms and how this process contributes to the system as a whole. (nitrogen cycle)
- Changes of Living Things
 - 7 layers of classification
 - Kingdom
 - Phylum
 - Class
 - Order
 - Family
 - Genus
 - Species
 - Binomial Nomenclature
 - Define and describe use for field guides and taxonomic keys
- Simple organisms
 - Viruses
 - Characteristics of a virus
 - Classification of viruses
 - Viral replication
 - Viruses and disease
 - Archeanbacteria and Eubacteria
 - Differentiate between Archean and Eubacteria
 - Characteristics
 - Kinds
 - Bacterial replication
 - Helpful bacteria
 - Harmful bacteria
 - Protist
 - Characteristics of Protist
 - Protozoa
 - Characteristics of protozoa
 - Sarcodines (ameba)
 - Ciliates (paramecia)
 - Flagellates
 - Sporozoa
 - Algae (move to 5th)
 - Characteristics of algae
 - Dinoflagellates

- Diatoms
 - Euglenas
 - Green Algae
 - Brown Algae
 - Red Algae
 - Fungi (move to 8th)
 - Characteristics of a fungi
 - Diversity of Fungi
 - Threadlike fungi
 - Sac fungi
 - Club fungi
 - Imperfect fungi
 - Lichens
 - Slime molds
- Classification (add)
 - Describe the history of classification in the life science
 - Describe the modern system of classification of organisms
- Invertebrates (add)
 - Define an invertebrate
 - Compare and contrast vertebrates and invertebrates
 - Classify according to form and function
 - Compare and contrast digestion, reproduction and habitat among the eight classes of invertebrates
 - Integrate regulation and behavior, i.e.: metamorphosis, societies
- Cells (add)
 - Trace the development of cell theory and explain the three steps of this theory
 - Identify the structures and functions of organelles found in animal and plant cells
 - Describe the nature of the cell membrane and explain how materials pass in and out of cells
 - Compare the energy processes of the cell
 - Identify and describe the levels of organization from cell to organism
- Muscular System (add)
 - Compare and contrast voluntary and involuntary muscle action
 - Explain how muscles produce movement
 - Explain why muscles must work to maintain tone
 - Describe common disorders and injuries to muscular system
- Integumentary System (add)
 - Describe how hair and nails grow
 - Identify disorders of the skin
 - Describe the differences between first, second and third degree burns
 - Explain the importance of using sunscreen lotions
 - Describe common injuries to the skin

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Diocesan: invertebrates: digestion, habit & reproduction; skin care

Life and Health Science

GRADE 7

- Plants
 - Characteristics of Plants
 - Plant evolution and classification (Diocesan only states structure and function not classification)
 - Nonvascular
 - Bryophytes (mosses, liverworts, and hornworts)
 - Characteristics
 - Life cycle
 - Vascular
 - Club mosses
 - Characteristics
 - Life cycle
 - Horsetails
 - Characteristics
 - Life cycle
 - Ferns
 - Characteristics
 - Life cycle
 - Gymnosperms
 - Characteristics
 - Life cycle
 - Angiosperms: Classifications and structure
 - Classification
 - Monocots
 - Dicots
 - Vascular tissue
 - Xylem
 - Pholem
 - Transpiration
 - Root Systems
 - Root structure
 - Epidermis
 - Cambium
 - Root types
 - Fibrous
 - Taproot
 - Above ground root
 - Shoot system

- Herbaceous Stems
 - Woody stems
 - Leaf systems
 - Leaf function
 - Leaf structure
 - Flower Structure (Sepal, stamen: anther and filament, Pistil: ovary stigma and style, Petal)
 - Fruit production
 - Plant growth
 - How plants grow
 - The role of plant hormones
 - Seasonal responses
 - Chemistry of Plants
 - Photosynthesis
 - Recognize that producers (plants that contain chlorophyll) (LS16)
 - use the energy from sunlight to make glucose from carbon dioxide and water through a process called photosynthesis. This food can be used immediately, stored, for later use, or used by other organisms.
 - Stage 1
 - Stage 2
 - Respiration
 - Fermentation (remove)
- The Digestive System
 - Types of Digestion
 - Mechanical
 - Chemical
 - Process of Digestion (parts and functions of each)
 - Mouth
 - Esophagus
 - Stomach
 - Small Intestines
 - Duodenum
 - Large Intestines
 - Rectum
 - Anus
 - Accessory Organs
 - Liver
 - Pancreas
 - Gallbladder
 - Absorption
 - Villi
 - Problems of the Digestive System
- The Excretory System
 - Organs and Functions
 - Liver

- Skin
- Kidneys
 - Nephrons
 - Ureter
 - Urinary Bladder
 - Urethra
- Disorders
 - Infection
 - Nephritis
 - Kidney Stones
- Circulatory System
 - Organs and functions
 - Heart
 - Atrium
 - Ventricle
 - Valves
 - Blood vessels
 - Arteries
 - Veins
 - Capillaries
 - Heart Rate
 - Blood Pressure
 - Circulation (superior and inferior vena cava, right atrium, tricuspid, right ventricle, **pulmonary semilunar valve**, pulmonary artery, lungs, pulmonary vein, left atrium, **aortic semilunar valve**, aorta, body.~~remove~~)
 - Systemic
 - Pulmonary
 - Blood
 - Plasma
 - Cells
 - Red blood cells
 - White blood cells
 - Platelets
 - Lymphatic System
 - Lymph
 - Lymph nodes
 - Blood types
 - Surface antigens
 - A, B, O, and AB
 - Cardiovascular Disease
- The Respiratory System
 - Breathing and Air Pressure
 - Organs and Functions
 - Nose
 - Pharynx
 - Trachea

- Lungs
 - Bronchi
 - Bronchiole
 - Alveoli
- Gas exchange
- Respiratory Disorders (remove)
- The Nervous System
 - Functions of the Nervous System
 - Organs and Functions
 - Central Nervous system
 - Brain
 - Cerebrum
 - Cerebellum
 - Medulla
 - Spinal Cord
 - Motor Neurons
 - Sensory Neurons
 - Peripheral Nervous System
 - Spinal Nerves
 - Nerves
 - Neurons: 3 types
 - Nerve Impulses
 - Reflex Actions
 - Sensory Receptors
 - Light and Seeing
 - Structure and Function of the Eye (remove)
 - Retina
 - Choroid
 - Sclera
 - Cornea
 - Aqueous Humor
 - Vitreous Humor
 - Iris
 - Pupil
 - Lens
 - Light and Image
 - Sound and Hearing
 - Sound Waves
 - Hearing
 - Parts and Function of the Ear (remove)
 - Outer Ear
 - Auricle
 - Auditory Canal
 - Middle Ear
 - Tympanic Membrane

- Ossicles (stapes/stirrup, incus/anvil, malleus/hammer)
 - Inner Ear
 - Semicircular canals
 - Oval Window
 - Cochlea
 - Auditory Nerve
 - Balance
 - Smell
 - Parts and Functions
 - Olfactory hairs (remove)
 - Olfactory Cells
 - Olfactory nerves
 - Olfactory Bulb
 - Taste
 - Taste buds
 - Touch
 - Sensory receptors
- Flowering Plants
 - Identify and give function of the parts of a seed
 - List the way seeds are dispersed
 - Explain seed dormancy and germination
 - Compare monocots and dicots and give examples
- Non-Flowering Plants
 - Discuss the structure and function of conifers
- Digestive System
 - Name and describe the six kinds of nutrients
 - Identify nutrients in various types of food
 - Apply weight control and exercise to maintaining good health
 - Formulate a fitness plan to maintain good health
 - Explain the effects on your digestive system if your doctor gave you an antibiotic that killed all the bacteria in your body
- Nervous System
 - Distinguish between the central nervous system, the peripheral nervous system and the autonomic nervous system
 - List the five sense organs and describe the function of each
 - Trace the pathway of a reflex response
 - Explain how the sense organs interact with the central nervous system

Life and Health Science

GRADE 8

- **Introduce** the characteristics of life
 - Reproduce (removed from 5th grade)
 - Asexual vs. sexual
 - Made of one or more cells
 - All cells come from pre-existing cells
- **Plant and Animal cells** (removed from 5th grade)
 - Differentiate between plant and animal cell
 - Define the term organelle
 - List and describe the function of the following organelles: nucleus, nuclear membrane, cell membrane, cell wall, cytoplasm, endoplasmic reticulum (rough and smooth), Golgi body, lysosome, mitochondria, vacuole, and chloroplast.
 - Recognize within cells, many of the basic functions of organisms are carried out. The way in which cells function similar in all living organisms.
 - Extracting energy from food
 - Getting rid of waste
 - Differentiate between prokaryotic and eukaryotic cells
- **Molecules of Life** (moved from 6th)
 - Protein and amino acids
 - Carbohydrates
 - Lipids
 - Nucleic acids, DNA, RNA
- **Movement of Substances** (moved from 6th)
 - Osmosis
 - Diffusion
 - Active transport
- **Living things and their environment** (moved from 6th)
 - Define biosphere and the 3 major components:
 - Hydrosphere
 - Lithosphere
 - Atmosphere
 - Hierarchy within the biosphere:
 - Individual
 - Population
 - Community
 - Ecosystem
 - Biome
 - Biosphere
 - Define ecosystem
 - Biotic vs. abiotic components

- Give examples of ways in which organism interacts and have different functions (niche) within an ecosystem which allow the ecosystem to survive.
- Energy and Living things (moved from 6th)
 - Explain the roles and relationships between producers, consumers and decomposers in the process of energy transfer in a food web (food chains, food webs and energy pyramid)
 - Explain how dead plants and animals are broken down by other living organisms and how this process contributes to the system as a whole. (nitrogen cycle)
- Simple organisms (moved from 6th)
 - Viruses
 - Characteristics of a virus
 - Classification of viruses
 - Viral replication
 - Viruses and disease
 - Archeanbacteria and Eubacteria
 - Differentiate between Archean and Eubacteria
 - Characteristics
 - Kinds
 - Bacterial replication
 - Helpful bacteria
 - Harmful bacteria
 - Protist
 - Characteristics of Protist
 - Protozoa
 - Characteristics of protozoa
 - Sarcodines (ameba)
 - Ciliates (paramecia)
 - Fagellates
 - Sporozoa
 - Fungi (moved from 6th)
 - Characteristics of a fungi
 - Diversity of Fungi
 - Threadlike fungi
 - Sac fungi
 - Club fungi
 - Imperfect fungi
 - Lichens
 - Slime molds
- Cell Growth and Division (remove)
 - Cell Division
 - Mitosis
 - Interphase
 - Prophase
 - Metaphase
 - Anaphase

- **Telophase**
 - **Mitosis in Plants**
- **Reproduction and Heredity**
 - Mendel and His experiments
 - Patterns of inheritance
 - Dominant and Recessive genes
 - Genotypes and Phenotypes
 - Homozygous
 - Heterozygous (hybrid)
 - Recognize that every living organism requires a set of instruction that specifies its traits. These instructions are stored in the organism's chromosomes. Heredity is the passage of these instructions from one organism to another. **(LS7)**
 - Recognize that hereditary information is contained in genes located in the chromosomes of each cell. A human cell contains about 30,000 different genes on 23 different chromosomes. **(LS8)**
 - Compare sexual reproduction (offspring inherit half of their genes from each parent/ gametes) with asexual reproduction (offspring is an identical copy of the parent's cell) **(LS9)**
 - Principles of Genetics
 - Punnett Squares
 - Meiosis
 - Sex Determination
 - X Chromosomes
 - Y Chromosomes
 - Sex-linked Traits
 - The Genetic Code
 - DNA
 - Structure
 - Replication
 - Transcription
 - DNA to RNA
 - Mutations
 - Chemical Mutagens
 - Inherited Diseases
- **Animal Kingdom (remove- not part of Diocesan nor Frameworks)**
 - **Characteristics of Animals**
 - **Classification of Animal**
 - **Symmetry**
 - **Invertebrate**
 - **Sponges**
 - **Cnidarians**
 - **Worms**
 - Flatworms
 - Round worms
 - Segmented worms
 - **Mollusks**

- Gastropods
- Bivalves
- Cephalopods
- Arthropods
 - Arachnids
 - Crustaceans
 - Centipedes and Millipedes
 - Insects
- Echinoderms
- Vertebrate
 - Common Characteristics
 - Fishes
 - General Characteristics
 - Jawless fish
 - Cartilaginous Fish
 - Bony fish
 - Amphibians
 - General Characteristics
 - Frogs and Toads
 - Salamanders and Newts
 - Reptiles
 - General characteristics
 - Lizards and Snakes
 - Turtles and Tortoises
 - Alligators and Crocodiles
 - Birds
 - General Characteristics
 - Diversity of Birds
 - Adaptations of flight
 - Bird Reproduction
 - Mammals
 - General Characteristics
 - Diversity of Mammals
 - Monotremes
 - Marsupials
 - Placental
 - Carnivora
 - Cetacea
 - Insectivora
 - Rodentia
 - Proboscidea
 - Primates
 - Chiroptera
 - Perissodactyla
 - Artiodactyla

- Lagomorpha

- Evolution and Biodiversity
 - Give examples of way in which genetic variation and environmental factors are causes of evolution and the diversity of organisms. (LS10)
 - Recognize that evidence draw from geology, fossils, and comparative anatomy, provides the basis of the theory of evolution. (LS11)
 - Relate the extinction of species to a mismatch of adaptation and the environment.
 - Recognize that biological evolution accounts for the diversity of species developed through gradual processes over many generations.
- Endocrine System
 - Functions
 - Endocrine Glands and Function
 - Hormones
 - Pituitary
 - Hypothalamus
 - Thyroid and parathyroid
 - Adrenals
 - Pancreas
 - Testes
 - Ovaries
 - Feedback Control of Hormone Levels
 - Disorders of the Endocrine System
- Reproductive System
 - Function
 - Male Reproductive System: Organs and Functions
 - Testes
 - Scrotum
 - Semen
 - Penis
 - Female Reproduction System: Organs and Functions
 - Ovaries
 - Oviduct
 - Uterus
 - Cervix
 - Vagina
 - Female Reproduction Cycle
 - Menstrual Cycle
 - Ovulatory Cycle
- Diseases and the Immune System
 - Causes of Disease
 - Kinds of Infections
 - Viral Disease
 - Bacterial Disease
 - Parasitic Disease
 - Spread of Infectious Disease
 - The body's Natural Defenses

- Skin
- Body Secretions
 - Saliva
 - Stomach Juices
 - Mucus
 - Tears
- Inflammation
- The Immune System
 - Recognition of Pathogens
 - Destruction of Pathogens
 - Antibodies
 - T Cells
 - Immunity
- Lower Kingdoms/Viruses and Monerans
 - Draw and identify the organelles of selected protists and describe their function
 - Compare and contrast the structure and life processes of viruses and monerans (bacteria)
 - Explain how bacteria are helpful and harmful
 - Analyze the role of bacteria in the food chain
- Lower Kingdoms/Protist
 - Draw and identify the organelles of selected protists and describe their function
 - Observe and describe how protozoans move
 - Compare and contrast classes within the algae phylum
- Lower Kingdoms/Fungi
 - Describe where fungi live and how they get food
 - Describe mycelium and hyphae of selected fungi
 - Distinguish between helpful and harmful fungi
 - Observe bread mold and mushrooms to compare and contrast their spore producing structures

Earth and Space Science

KINDERGARTEN

- **Introduce** the weather changes from day to day and over the seasons. (ES3)
- **Introduce** day and night
 - **Relate day and night to the revolution of the earth (remove)**
- **Introduce** events around us that have repeating patterns, including the season of the year, day and night. (ES5)

Earth and Space Science

GRADE 1

- Reinforce the weather changes from day to day and over the seasons (ES3)
 - Observe and record the daily temperature, amount of cloud cover and precipitation.
 - Introduce the proper use of a thermometer.
- Introduce that idea that the sun provides heat and light to the earth and is necessary for life. (ES4)
 - ***Record the time of day that the sunshine in different school locations and note patterns***
- Introduce the concept of human impact on the environment and the idea of stewardship.
- Introduce how rainbows are formed

Earth and Space Science

GRADE 2

- Earth Science
 - **Introduce** that water, rocks, soil and living organisms are found on the earth's surface.
 - **Introduce** that air is a mixture of gases that is all around us and wind is moving air.
- Weather
 - Introduce the concept that patterns of atmospheric movement and pressure create our weather.
 - Introduce the use of a barometer and anemometer and reinforce the use of a thermometer.
 - Reinforce and describe different types of precipitation and storms (rain, snow, sleet, hail, hurricanes, tornado) **(ES7) (not introduced)**
 - Reinforce and name cloud formations **(not introduced)**
- Reinforce knowledge of the water cycle. **(not introduced)**
 - Recognize that $\frac{3}{4}$ of the earth's surface is covered by water.
 - Reinforce the basic concept of condensation, evaporation and precipitation.
- The Earth in the solar system.
 - Reinforce the concept that the earth is part of a system called the "solar System" that includes the sun (a star), planets, and many moons. **(ES13) (not introduced)**
 - Reinforce the concept that the Earth is the third planet from the sun in our solar system. **(ES13) (not introduced)**
 - **Introduce** a size comparison between the Earth and the Sun.
 - **Introduce** that the Earth revolves around (orbits) the sun in a year's time. **(ES14)**
 - **Introduce** that the Earth rotates on its axis once approximately every 24 hours. **(ES14)**
 - **Introduce** connections between the rotation of the earth and day/night, and the apparent movement of the sun, moon, and stars across the sky. **(ES14)**

Earth and Space Science

GRADE 3

- Soil
 - Introduce the ways in which soil is formed (the weathering of rock by water and wind and from the decomposition of plant and animal remains.) (ES4)
 - Introduce the different properties of soil, including color, texture, (size of particles), the ability to retain water, and the ability to support the growth of plants.
- Structure of the Earth
 - Introduce the layers of the Earth
 - Crust
 - Mantle
 - Core
 - Explain that the Earth's crust is made up of several large "plates" that are in constant motion. (introduce)
 - Introduce the motion of the Earth's plates with earthquakes and volcanic activity.
 - Introduce how the surface of the Earth changes due to slow processes such as erosion, and weathering, and rapid processes such as landslides, volcanic eruptions, and earthquakes. (ES12)
- The water cycle
 - Reinforce distinguishing among the various forms of precipitations (rain, snow, sleet and hail), making connections to the weather in a particular place. (ES7)
 - Reinforce how water on earth cycles in different forms and in different locations including underground and in the atmosphere. (ES10)
 - Reinforce the observation of clouds and introduce the proper names for each cloud formation.

*** Use a terrarium to demonstrate the water cycle***
 - Introduce how the cycling of water, both in and out of the atmosphere, has an effect on climate. (ES11)
- The Moon
 - Introduce the changes that occur in the observable shape of the moon over the course of a month. (ES15)

Earth and Space Science

GRADE 4

- Weather
 - Reinforce differentiating between climate and weather. (ES9)
 - REinforce how air temperature, moisture, wind speed and direction, and precipitation make up the weather in a particular place and time. (ES6)
 - Introduce the concept that the earth's surface can be divided into 6 major biomes (tundra, coniferous forest, deciduous forest, grassland, deserts, and rainforests) based on climate (precipitation and temperature). (reinforce)-remove
- Rocks and their properties
 - Reinforce a simple explanation of what a mineral is and some examples. (e.g. quartz and mica) (ES1)
 - Identify the physical properties of minerals (hardness, color, luster, cleavage, and streak) and explain how minerals can be tested for these different physical properties. (ES2)
 - **Introduce** the three categories of rocks (metamorphic, igneous, and sedimentary) based on how they are formed (rock cycle) and explain the natural and physical processes that create these rocks. (ES3) (reinforce)- never introduced
- Solar System
 - Reinforce the concept that the Earth is a part of a system called the "Solar System" that includes the sun (a star), planets and many moons. (ES13)
 - **Reinforce** naming and describing the 9 planets in our solar system.
 - Introduce and reinforce that in addition to the sun, 9 planets and their moon(s) our solar system also contains smaller, celestial bodies. (comets, asteroids and the meteor family)
 - **Recognize that the earth revolves around (orbits) the sun in a year's time and that the earth rotates on its axis once approximately every 24 hours. Make connection between the rotation of the earth and day/night, and the apparent movement of the sun, moon, and stars across the sky. (ES14)**

Diocesan: Weather: seasonal changes

Earth and Space Science

GRADE 5

- Weather
 - Explain the relationship among the energy provided by the sun, the global patterns of atmospheric movement, and the temperature differences among water, land and atmosphere. (ES4 6-8)
 - Describe how global patterns such as the jet stream and water currents influence local weather in measurable terms such as temperature, wind direction and speed, and precipitation. (ES8)
 - Air pressure
- Geologic Eras of the Earth's history
 - Introduce the concept of geologic time.
 - Introduce the 4 major Eons/Eras in the earth's history and the development of life during these time frames.
- Earth, Moon, and Sun
 - Investigate and compare the following characteristics of the Earth, moon and sun.
 - Age
 - Size
 - Surface features
 - Describe lunar and solar eclipses, the observed moon phases, and tides. Relate them to the relative positions of the earth, moon, and sun. (ES9 6-8)
 - Explain how the tilt of the earth and its revolution around the sun result in an uneven heating of the earth, which in turn causes the seasons. (ES11 6-8)

Diocesan: The Ocean: Ecosystem; Conservation of Soil Water: Ecological responsibility

Earth and Space Science

GRADE 6

- Water biomes
 - The oceans
 - Layers of the Ocean
 - Fresh Water ecosystem
 - Rivers, streams, ponds, lakes, marshes, estuaries.
- History of the Continents
 - Continental drift
 - Pangea, laurasia, and Gondwanaland
 - Sea Floor Spreading
- Astronomy: Stars, Planets, Asteroids, Meteors, and Comets
 - Life cycle of a star
 - Compare and contrast properties and conditions of objects in the solar system to those on earth (i.e. distance from the sun, rotational and revolutionary periods, and number of natural satellites, **gravitational force, speed, movement.** temperature and atmospheric conditions.) (ES10)
 - Investigate the smaller celestial bodies found in our solar system: comets, asteroids, and the meteor family.
- Mapping Representation of the Earth
 - Recognize, interpret, and be able to **create models (don't create models)** of the earth's common physical features in various mapping representations, including contour maps. (ES1)
- **Fresh Water**
 - Describe the water cycle using appropriate technology
 - Identify sources of fresh surface water
 - Explain the importance of glaciers to the freshwater supply
 - Name, locate and describe the watershed he/she lives in
 - Identify sources of freshwater under the Earth's surface
 - Define permeability and give examples of materials that are permeable and impermeable
 - Demonstrate how water is filtered in nature
 - Recognize and explain the difference between artesian wells and other wells
 - Perform water quality tests and interpret results
 - Relate water's ability to serve as a solvent to water pollution
 - List ways to protect freshwater sources
- **Earth's Oceans**
 - Identify the earth's oceans and locations
 - Distinguish between currents, waves and tides
 - Describe the movements of warm/cold currents
 - Explain the impact of ocean currents on weather patterns

- Explain the desalination process
- Name, locate and describe the temperature of three zones
- Define terminology used in moving from continent to the ocean zones
- Perform sonic depth sounding
- Collect data and diagram the topography of the ocean floor
- Identify, specify, locate and chart the animal and plant life in the three time zones

Missing Electricity and Magnetism

Earth and Space Science

GRADE 7

- Earth's structure and Heat Transfer in the Earth's System. (ES2)
 - Describe the layers of the solid earth (physical and chemical layers)
 - Describe how the balance between temperature and pressure determine the physical state of each layer of the earth.
 - Differentiate between continental and oceanic crust.
 - Differentiate among radiation, conduction, and convection. The three mechanisms by which heat is transferred through the earth's system. (ES3)
 - Describe how the earth's lithospheric plates move by convection.
- Earth's History
 - Describe how the movement of the earth's crustal plates causes both slow and rapid changes in the earth's surface. (ES5)
 - Describe and give examples of ways in which the earth's surface is built up and torn down by natural processes, including deposition of sediments, rock formation, erosion and weathering. (ES6)
 - Describe the different mountain and plateau formations and how they are formed.
 - Explain and give examples of how physical evidence, such as fossils and surface features of glaciations, supports theories that the earth has evolved over geologic time. (ES7)
 - Differentiate between an oceanic and continental plate.
 - Define the three types of plate boundaries based on plate movement.
 - Describe the results of interaction at plate boundaries: uplift, subduction.
 - Outline the major geologic eras in broad terms, citing their time spans and their major forms of life
 - Identify fossils and describe how fossil evidence contributes to our knowledge of the earth's evolution and the history of different species
 - Cite the effects of water, wind and ice in describing change in land forms over time, the implications of erosion, some conservation attempts, both long ago and recently
- Volcanoes and Earthquakes
 - Causes of earthquakes
 - Define the three types of seismic waves (P waves: primary, S waves: secondary, and L waves: surface) and their properties. (Speed, strength, wave type.)
 - Quantitation of seismic waves.
 - Surface damage that results from an earthquake.
 - Structure of volcanoes.
 - Types of volcanoes: shield, composite and cinder cone.
 - Lava and pyroplastic characteristics for each volcano.
- Soil formation (remove)
 - Describe soil vs. dirt

- Describe the components of soil
- Define the characteristics of soil:
 - Particle size
 - Particle shape
 - pH
 - organic
 - living matter
 -

Diocesan: major geological eras; erosion; rocks

Earth and Space Science

GRADE 8

- Origin of the Universe Theory vs. Genesis
 - Describe the Big Bang theory
 - Compare the Big Bang theory to Genesis
 - Describe the Expanding Universe Theory and explain the three possible outcomes.
 - Ptolemy: geocentric model vs. Copernicus: heliocentric model of the solar system.
- Classification of a Galaxy
 - Recognize that the universe contains many billions of galaxies, and that each galaxy contains many billions of stars. (ES12)
 - Classify galaxies utilizing the classification scheme developed by Hubble.
- Kepler's Laws
 - Introduce Kepler's three laws describing planetary motion.
- Role of Gravity in the Universe
 - Recognize that gravity is a force that pulls all things on and near the earth toward the center of the earth. Gravity plays a major role in the formation of the planets, stars, and solar system and in determining their motions. (ES8)
- Ecosystems/Biomes
 - Define an ecosystem including living and non-living factors
 - Identify the population of an ecosystem
 - Illustrate a food web and identify the relationships among producers, consumers and decomposers
 - Describe the flow of energy throughout an ecosystem
 - Explain (relate) how available resources affect populations
 - Describe the factors that would lead to succession
 - Relate how human interactions affect an ecosystem
 - Define a biome
 - Compare and contrast different biomes
- Universe and Our Solar System
 - Discuss scientists' theories related to the beginnings of the universe and relate this study to the Genesis account of creation
 - Demonstrate an understanding of Kepler's laws
 - Explain the life cycle of a star

