



Science Curriculum

	Early Childhood 3-6 years	Lower Elementary 6-9 years	Upper Elementary 9-12 years	Middle School 12-14 years
Life Science				<p>Investigate the connections between all living things</p> <p>Be familiar with the 6 characteristic of living things</p> <p>Illustrate an understanding of the 6 kingdoms of life</p> <p>Understand the connections between chemical elements and the function of healthy cells</p> <p>Understand the organization of living things from simple to complex</p> <p>Differentiate between prokaryote and eukaryote cells</p>
Life Science: Botany	<p>Develop an awareness of the qualities of plants and how they live and reproduce</p> <p>Experience observing and discussing nature</p> <p>Develop an awareness of the differences between plants and how the differences and similarities are used for classification</p>	<p>Practice of classified nomenclature of the plant</p> <p>Exposure to and practice of classified nomenclature for roots, stems, leaves, flowers, fruits and seeds</p> <p>Exposure to the impressionistic charts for botanical processes</p>	<p>Understands the vital functions of plant life - eating, breathing, sensitivity, movement & support, reproduction</p> <p>Demonstrate working knowledge of botanical terminology dealing with parts of the plant and processes</p> <p>Exposure to the impressionistic charts for botanical processes</p>	<p>Explore hydroponic gardening</p> <p>Understand the process of respiration and transpiration</p> <p>Demonstrate an understanding of the process of photosynthesis</p>



Science Curriculum

	Early Childhood 3-6 years	Lower Elementary 6-9 years	Upper Elementary 9-12 years	Middle School 12-14 years
	Discover how and where plants grow	Explore plants basic needs for survival through presentations and experimentation	Identify the nutritive needs of a plant	Differentiate between organic and inorganic compounds
	Explore plant's basic needs through gardening	Perform a plant dissection	Experience the nitrogen cycle through a simulation activity	Identify the essential organic and inorganic compounds needed for life
	Identify a plant's basic needs	Translate knowledge of plant needs to plant care activities	Describe the role of legumes in the nitrogen cycle	Distinguish between the various methods of cell reproduction
	Discover the sensory qualities of plants	Demonstrate an understanding of plant classification through the use of the classification charts	Explore respiration in plants through experimentation	Examine enzymes and their jobs
	Experience guided plant classification	Compare plant growth differences based on sun exposure and access to water	Understand gaseous exchange in plants	Define and examine carbohydrates, lipids, proteins and fats
	Locate and define the external parts of a plant	Exposure to the specific jobs of plant parts	Recognize and understand the water cycle and its various stages	Analyze the parts of a cell and their functions
	Investigate the life cycle of a plant through experimentation and gardening	Exposure to the photosynthetic process	Relate the various types of plant roots to their functions	
	Discuss plant parts and their functions	Demonstrate an understanding of the important role plants play in ecological communities	Use appropriate terminology for parts of the root and root types	
	Dissect a flower	Perform plant research	Investigate the work of roots through experimentation	



Science Curriculum

	Early Childhood 3-6 years	Lower Elementary 6-9 years	Upper Elementary 9-12 years	Middle School 12-14 years
	Observe the similarities and differences of plant parts between species	Demonstrate an understanding of plant's evolution through the timeline of life	Introduced to root pressure and capillary action	
	<p>Demonstrate familiarity with parts of a flower vocabulary</p> <p>Investigate the various shapes of leaves in the world</p> <p>Collect and trace leaves</p> <p>Translate knowledge from leaf cabinet materials to real leaves</p> <p>Explore leaf shape vocabulary</p>	Exposure to Plant Stories	<p>Understand the process of transpiration</p> <p>Demonstrate an understanding of the importance of chlorophyll for plants</p> <p>Familiarity with the process of photosynthesis</p> <p>Describe the process of "circulation" in plants using appropriate vocabulary</p> <p>Summarizes the vegetative functions of plants</p> <p>Identify mechanisms plants use to react to their surroundings</p> <p>Familiarized with plant defense mechanisms</p> <p>Ability to identify common plants using a botanical key</p> <p>Demonstrates an understanding of plant reproduction; asexual, sexual, alternate sexual and vegetative</p> <p>Exposure to plant communities and ecosystems</p> <p>Ability to utilize botanical knowledge for plant care</p>	



Science Curriculum

	Early Childhood 3-6 years	Lower Elementary 6-9 years	Upper Elementary 9-12 years	Middle School 12-14 years
			Identify types of seeds and dispersal methods Complete plant research regarding the plant kingdom	
			Demonstrate knowledge of classification within the plant kingdom Ability to differentiate between monocots and dicots Investigation about the importance of plants to the planet and its inhabitants Recognizes a plant cell and its organelles	
Life Science: Human Anatomy	Practice body part awareness through exercise Demonstrate an understanding of body part vocabulary Identify the parts of the body		Familiar with the Great River Fable as an analogy for the human body Introduction to the animal cell Employs understanding of animal cells to human anatomy Describes the parts of a cell and their functions Exposure to the methods of cell reproduction Demonstrate familiarity with the skeletal system and its function Ability to identify major bones in the skeleton	DNA Genetic Diversity Human Physiology Health Describe Mitosis and Meiosis Distinguish between the various methods of cell reproduction Examine enzymes and their jobs



Science Curriculum

	Early Childhood 3-6 years	Lower Elementary 6-9 years	Upper Elementary 9-12 years	Middle School 12-14 years
			<p>Differentiates between types of bones</p> <p>Recognize the functions of the muscular system and identify the major components</p>	<p>Define and examine carbohydrates, lipids, proteins and fats</p> <p>Define DNA and RNA and their role in reproduction and heredity</p>
			<p>Exposure to the physics of muscle movement</p> <p>Relate muscle development with exercise and personal health</p> <p>Differentiate between types of joints</p> <p>Applies knowledge of digestive system components using appropriate nomenclature</p> <p>Formulate and understanding of the digestive process and its ability to absorb nutrients through experimentation</p> <p>Investigate basic nutrition using the food groups, vitamins and minerals</p> <p>Ability to plan a healthy meal</p> <p>Identify the parts and functions of the respiratory system</p> <p>Explore body systems through the use of models</p>	<p>Investigate cell theory</p> <p>Explore and analyze the blueprints of life</p> <p>Summarize the history of genetics</p> <p>Simulate the probability of genetics</p> <p>Represent knowledge of DNA through model building</p> <p>Distinguish between genotype and phenotype and specific coding genes</p> <p>Explore heredity through a punnet square</p> <p>Analyze how genetics determine a person's identity</p> <p>Explore human genetic disorders</p>



Science Curriculum

	Early Childhood 3-6 years	Lower Elementary 6-9 years	Upper Elementary 9-12 years	Middle School 12-14 years
			<p>Explore diseases effects on the body systems</p> <p>Identify the parts and functions of the excretory system</p> <p>Analyze the importance of skin and its role in the integumentary system</p> <p>Demonstrate an understanding of the three types of circulation</p>	
			<p>Identify the parts of the circulatory system including the parts of the heart</p> <p>Introduction to types of blood vessels, cells and blood types</p> <p>Familiar with the parts and functions of the immune system</p> <p>Establish an understanding of human sexual reproduction through body education</p> <p>Demonstrate a knowledge of the nervous system and its role in regulation of the body</p> <p>Recognize the physics of nerve impulses</p> <p>Establish the many jobs and parts of the brain</p> <p>Conceptualize the roles of the 5 senses and the brain</p> <p>Explore the 5 senses through experimentation</p>	



Science Curriculum

	Early Childhood 3-6 years	Lower Elementary 6-9 years	Upper Elementary 9-12 years	Middle School 12-14 years
			<p>Identify the anatomical components that make up each sense; tongue, ear, nose, eye</p> <p>Ability to conceptualize how the body systems work together to form a whole organism</p> <p>Construct models of various organs and organ systems</p>	



Science Curriculum

	Early Childhood 3-6 years	Lower Elementary 6-9 years	Upper Elementary 9-12 years	Middle School 12-14 years
Life Science: Zoology	<p>Explore the timeline of natural history Ability to classify thing as living or non-living</p> <p>Categorize things as plant, animal and mineral</p> <p>Differentiate between vertebrate and invertebrates Discover the backbone and its purpose</p> <p>Introduce the major classification of the animal kingdom Classify living animals</p> <p>Demonstrate an understanding that animals belong to subgroups of a larger class Explore the 5 classes of vertebrates</p>	<p>Investigate the first life on earth Explore evolution through the timeline of life and guided research Classify animals into invertebrates and vertebrates Perform 5 kingdom research</p> <p>Explore animal classification through the use of the charts Identify the characteristics of a vertebrate</p> <p>Demonstrate the ability to find an animal's scientific name using taxonomic classification Layout vertebrate matrix</p> <p>Analyze how vertebrates are related based on similarities and differences</p>	<p>Investigate the first life on earth Explore evolution through the timeline of life and guided research Differentiate between the 6 kingdoms and their members Complete guided animal research</p> <p>Classify animals as vertebrates and invertebrates Demonstrate knowledge of the animal kingdom and its components Understand Linnaean taxonomic classification</p> <p>Classify types of vertebrates and invertebrates to phyla and class</p> <p>Identify the main characteristics of the types of vertebrates and their differences; movement, skin, skeleton, respiration, circulation and reproduction</p>	<p>Illustrate an understanding of the 6 kingdoms of life Analyze the parts of a cell and their functions</p> <p>Construct a model cell</p> <p>Employ Linnaean taxonomic classification to living things Recognize the differences between bacteria and viruses Examine fungi and identify their differences from other kingdoms Investigate the kingdom protista and the 3 major types</p> <p>Explore how bacteria multiply</p> <p>Examine the spreading of spores as a means of reproduction for fungi</p>



Science Curriculum

	Early Childhood 3-6 years	Lower Elementary 6-9 years	Upper Elementary 9-12 years	Middle School 12-14 years
	Introduce vocabulary for the categories of invertebrates	Introduction to classification based on similarities and differences	Conceptualize animal physiology through the study of the functions of animals	Classify types of vertebrates and invertebrates to phyla and class
	<p>Discover how animals' characteristics can help us tell how they live</p> <p>Exposure to vocabulary for the external parts of vertebrates and invertebrates</p> <p>Demonstrate an understanding of the universality of the body parts of animals</p>		<p>Understand the vital functions of animals through nourishment, respiration, circulation, vegetative functions, movement, sensitivity, and reproduction for the various phyla and classes</p> <p>Assemble the vital functions of animals card matrix</p> <p>Explore classification through the Chinese box material</p> <p>Utilize the tree of life to show the connectedness and hierarchy of the animal kingdom</p>	<p>Identify the main characteristics of the types of vertebrates and their differences; movement, skin, skeleton, respiration, circulation and reproduction</p> <p>Conceptualize animal physiology through the study of the functions of animals</p> <p>Understand the vital functions of animals through nourishment, respiration, circulation, vegetative functions, movement, sensitivity, and reproduction for the various phyla and classes</p> <p>Assemble the vital functions of animals card matrix</p> <p>Explore various animal body structures and symmetry</p> <p>Define the characteristics of invertebrate systems</p>



Science Curriculum

	Early Childhood 3-6 years	Lower Elementary 6-9 years	Upper Elementary 9-12 years	Middle School 12-14 years
				Define the characteristics of vertebrate systems
Life Science: Ecology			Demonstrate an understanding of the components of biomes	Understand how ecosystems, populations and communities are interdependent and interrelated
			Compare and contrast biomes Exposure to ecological roles of living things	Recognize the components of a biome Compare and contrast types of biomes Identify the parts of a biome Recognize an environments impacts of populations Exhibit an understanding of relationships between living organisms Generalize the ecological roles that living organisms fulfill in an ecosystem
Earth& Space Science: Cosmology	Introduction to the solar system through presentations and demonstrations Introductions to the concept that the earth and planets move in space and orbit the sun	Introduction to the solar system through demonstrations and research Translate knowledge of the big bang to an artistic representation	Investigate the formation of stars Understand the role of attractive forces in star formation	



Science Curriculum

	Early Childhood 3-6 years	Lower Elementary 6-9 years	Upper Elementary 9-12 years	Middle School 12-14 years
		<p>Investigate the earth's rotation and revolutions through demonstration</p> <p>Understand how the sun heats the earth</p> <p>Exposure to the concept of radiation through the earth's ability to store heat</p>	<p>Demonstrate an understanding of the importance of centripetal and centrifugal forces in celestial body formation</p> <p>Define scale as it relates to drawings and representations of celestial bodies</p> <p>Memorize the order of the planets in the solar system</p> <p>Demonstrate an understanding of the layers of the sun</p>	
			Exposure to the physical geography impressionistic charts	
Earth & Space Science: Earth Science	<p>Understand the differences between air, land, and water</p> <p>Exposure to basic cartography principals</p> <p>Identify common land and water forms</p> <p>Construct landform models</p>	<p>Demonstrate the ability to recognize and identify the continents and oceans</p> <p>Understand that our globe is divided into hemispheres</p> <p>List and locate all the continents and oceans</p> <p>Complete continent and country research</p>	<p>Discover the properties of air and deduce how they impacts our planet</p> <p>Understand the formation of volcanoes and identify the parts of a volcano</p> <p>Acknowledge that many processes were needed to form the earth</p> <p>Explain the importance of rain on the cooling of the forming earth</p>	<p>Summarize the roll of a geologist</p> <p>Formulate an understanding of the rock cycle</p> <p>Classify rocks using the scientific method</p>



Science Curriculum

	Early Childhood 3-6 years	Lower Elementary 6-9 years	Upper Elementary 9-12 years	Middle School 12-14 years
	<p>Demonstrate the ability to recognize and identify the continents and oceans</p> <p>Use the puzzle maps to learn about political geography</p> <p>Develop an awareness of the physical qualities of rocks</p> <p>Develop an awareness of how minerals are formed</p> <p>Introduce mineral classification</p> <p>Explore the differences between rocks</p>	<p>Construct a map based on basic map-making principles</p> <p>Use the puzzle maps to learn about political geography</p> <p>Explore the horizontal configuration of the earth through model building and landforms</p> <p>Categorize geographic forms into land and water forms</p> <p>Demonstrate a working knowledge of landform vocabulary</p> <p>Locate landforms on a map</p>	<p>Explore and understand the causes and impacts of erosion on our changing planet</p> <p>Identify the layers of the earth and its surrounding atmosphere</p> <p>Explore stratification of rocks and sedimentation</p> <p>Model mountain building, faults, and tectonic movements</p> <p>Investigate the rock cycle</p> <p>Explore and classify common minerals using harness and streak testing</p>	
	<p>Categorize rocks and minerals by texture</p> <p>Exposure to rock types vocabulary</p>	<p>Identify the parts of the inner earth</p> <p>Investigate mountains through vocabulary, research and experimentation</p> <p>Investigate rivers through vocabulary, research and experimentation</p>	<p>Classify, compare and contrast a variety of rocks into sedimentary, igneous and metamorphic</p> <p>Define solar energy</p> <p>Categorize types of sun rays based the angle they approach the earth and the light intensity they deliver</p>	



Science Curriculum

	Early Childhood 3-6 years	Lower Elementary 6-9 years	Upper Elementary 9-12 years	Middle School 12-14 years
		<p>Investigate volcanoes through vocabulary, research and experimentation Exposure to erosion demonstration</p> <p>Introduction to the concept of sedimentation through models and demonstration Use experimentation to learn about the earth's crust and stratification of rocks Exposure to the impressionistic charts of functional geography Acknowledge many processes were needed to form the earth Introduction to the rock cycle</p>	<p>Explore the greenhouse effect</p> <p>Define troposphere, stratosphere and ionosphere Investigate heat absorption and reflection by the earth</p> <p>Demonstrate an understanding of the earth's daily, seasonal and yearly rotations Use maps to locate places using latitude and longitude Demonstrate an understanding of time zones Understand the distribution of heat and astronomic zones</p>	
			<p>Hypothesize about the impact of heat distribution on the living world Explore air circulation and its role in wind formation Understand high and low pressure and explain how they contribute to weather formation</p>	



Science Curriculum

	Early Childhood 3-6 years	Lower Elementary 6-9 years	Upper Elementary 9-12 years	Middle School 12-14 years
			Categorize types of winds Explain the coreolis effect Demonstrate an understanding of cold and warm marine currents and be able to locate them on a map Investigate the water cycle and the behavior of water Ability to find and identify the earth's major rivers on a map Classify rivers according to their age and shape Understand that rivers form many landforms through the power of erosion Recognize the impacts of frost and thaw on the surrounding environment Identify and define the landforms formed as a result of the work of water Relate water availability to biomes Investigate the work of water through experimentation	
			Exposure to the physical geography impressionistic charts	



Science Curriculum

	Early Childhood 3-6 years	Lower Elementary 6-9 years	Upper Elementary 9-12 years	Middle School 12-14 years
			Exposure to the impressionistic charts of functional geography	
Physical Science: Chemistry		<p>Demonstrate an understanding of the states of matter</p> <p>Explore changes in state through experimentation</p>	<p>Use appropriate terminology for the parts of an atom and identify each component and its charge</p> <p>Identify a variety of elements and their properties using the periodic table</p> <p>Differentiate between elements, compounds and mixtures</p> <p>Exposure to famous chemists from history and their discoveries</p> <p>Define and explain atomic mass and atomic number</p> <p>Summarize the story of Mendeleev and the formation of the periodic table</p> <p>Demonstrate an understanding of the structure, groups and families of the periodic table</p> <p>Build the periodic table</p>	<p>Properties of matter</p> <p>Atoms</p> <p>Molecular Structure</p> <p>Investigate the structure of an atom</p> <p>Demonstrate the ability to measure matter through experimentation and calculations</p> <p>Identify the particles of matter and their abundance</p> <p>Classify matter according to state</p> <p>Be familiar with the processes of state changes</p>



Science Curriculum

	Early Childhood 3-6 years	Lower Elementary 6-9 years	Upper Elementary 9-12 years	Middle School 12-14 years
			<p>Categorize elements according to their properties</p> <p>Construct a Bohr model of various elements</p> <p>Complete element research</p> <p>Construct basic compounds and molecules</p> <p>Ability to write and identify chemical equations for common molecules</p> <p>Demonstrate an understanding of acids, bases and the pH scale</p> <p>Explore acids and bases through experimentation</p> <p>Differentiate between chemical and physical changes</p> <p>Explore chemical reactions through experimentation</p> <p>Define and classify the components of a solution, colloid, suspension and mixture</p>	<p>Probe the behavior of gasses through experimentation</p> <p>Organize state changes into physical and chemical</p> <p>Investigate how the organization and properties of elements determine how molecules are structured</p> <p>Examine the periodic table of elements</p> <p>Define and explain atomic mass and atomic number</p> <p>Analyze types of chemical bonds through chemical interactions</p> <p>Demonstrate an understanding of the structure, groups and families of the periodic table</p> <p>Categorize elements according to their properties</p> <p>Explore trends in the periodic table</p> <p>Understand how ions form</p>



Science Curriculum

	Early Childhood 3-6 years	Lower Elementary 6-9 years	Upper Elementary 9-12 years	Middle School 12-14 years
			Investigate heat, convection, conduction and induction	
Physical Science: Physics	Understand that all things have weight and weight can be used for comparison	Exposure to force concepts through demonstrations Perform inertia and gravity experiments	Define the various types of energy and be able to categorize examples of each Understand and explore energy transformations through experimentation Summarize the laws of energy conservation Design and construct an energy roller coaster to explore potential and kinetic energy Investigate heat, convection, conduction and induction	Interaction of matter and energy Exhibit a knowledge of the various forms of energy Explore Fossil fuels and other forms of energy
Physical Science: Dynamics			Demonstrate familiarity with the various aspects of Dynamics Be familiar with kinds of forces and explore their properties through experimentation Demonstrate an understanding of Newton's laws of motion	Examine mechanical energy and its efficiency Investigate the laws of thermodynamics through experimentation Explore transformations of energy



Science Curriculum

	Early Childhood 3-6 years	Lower Elementary 6-9 years	Upper Elementary 9-12 years	Middle School 12-14 years
			<p>Define common dynamics vocabulary including those for motion, forces and gravity concepts</p> <p>Explore simple machines through the use of models, experimentation, and construction</p>	<p>Design and construct a model rollercoaster that demonstrates an understanding of energy and thermodynamics</p> <p>Show a knowledge of work and power and the measurement of each respectively</p>
			<p>Classify the simple machines contained within common items</p> <p>Investigate dynamics concepts through experimentation</p> <p>Explore simple machines through the use of models, experimentation, and construction</p> <p>Classify the simple machines contained within common items</p>	<p>Examine how machines change the way work is done</p> <p>Explore simple machines through the use of models, experimentation, and construction</p> <p>Formulate a clear understanding of dynamics concepts including motion, forces and energy</p> <p>Examine mechanical energy and its efficiency</p>
Physical Science: Electricity & Magnetism			<p>Demonstrate an understanding of electricity and basic circuitry</p> <p>Compare and contrast types of conductors and insulators</p>	<p>Examine how energy is changed into useful electrical power</p> <p>Explore generating an electric current through experimentation</p>



Science Curriculum

	Early Childhood 3-6 years	Lower Elementary 6-9 years	Upper Elementary 9-12 years	Middle School 12-14 years
			<p>Use guides and charts to build basic circuit modes using a model kit Be able to draw basic circuit maps</p> <p>Investigate magnetism, electromagnets, and magnetic fields through experimentation and research</p> <p>Demonstrate the ability to use read and use a compass</p>	<p>Compare and contrast types of conductors and insulators</p> <p>Investigate the laws that govern electromagnetic forces</p> <p>Summarize Maxwell's four laws of electromagnetism</p> <p>Demonstrate an understanding of the basic properties of all magnets</p> <p>Explore the magnetism of the earth</p>
				<p>Exhibit knowledge of magnetic fields and electric currents</p> <p>Investigate electromagnetism</p> <p>Demonstrate the ability to use and read a compass</p> <p>Examine static electricity and electric charge through experimentation</p> <p>Recognize and construct series and parallel circuits</p> <p>Understand how current is measured</p>
Physical Science: Light	Explore color mixing through experimentation		Familiarity with vocabulary related to light and its behavior	



Science Curriculum

	Early Childhood 3-6 years	Lower Elementary 6-9 years	Upper Elementary 9-12 years	Middle School 12-14 years
			Establish an understanding of the visible spectrum and how the eye sees colors Explore light behavior through experimentation with reflection, refraction, lenses and optics Be exposed to the use of light for energy through solar cells	
Physical Science: Sound			Demonstrate knowledge of the properties of sound Explore pitch and tone through experimentation Evaluate how various musical instruments produce sound	
			Construct a musical instrument from found and recycled objects	
Scientific Inquiry	Establish a sense of wonder at beauty of nature Develop an awareness of humans relationship to place, nature and time Instill a sense of responsibility for the environment Ability to use a magnifying glass	Practice with the use of a scale Practice hypothesis formation Perform experiments Understand the many jobs of scientists	Be familiar with each step in the scientific method Apply the scientific method to experiments Demonstrate an understanding of experimental design Design, execute, and evaluate experiments	Be familiar with each step in the scientific method Apply the scientific method to experiments Demonstrate an understanding of experimental design Demonstrate designing a controlled experiment



Science Curriculum

	Early Childhood 3-6 years	Lower Elementary 6-9 years	Upper Elementary 9-12 years	Middle School 12-14 years
	<p>Demonstrate an ability to make predictions and observations</p> <p>Introduced to the process of experimentation and the scientific method</p> <p>Experience use of a scale</p>	<p>Introduction to making judgments based on scientific criteria</p> <p>Perform model building</p> <p>Understand and utilize the step of the scientific method</p>	<p>Perform model building</p> <p>Be familiar with lab safety procedures and expectations</p> <p>Understand the importance of accuracy and precision when taking scientific measurements</p> <p>Demonstrate working knowledge of lab wear vocabulary</p> <p>Ability to accurately use basic lab equipment</p>	
Technology			<p>Be familiar with the parts of a microscope</p> <p>Use a microscope</p> <p>Demonstrate an ability to use the computer to produce a graph</p>	<p>Green technology</p> <p>History of science technology</p> <p>Demonstrate knowledge of the parts of a microscope</p>
				<p>Utilize a microscope</p> <p>Explore hydroponic gardening</p> <p>Categorize renewable and non-renewable resources</p> <p>Examine how humans can balance the use of fossil fuels with other forms of energy</p>



Science Curriculum

	Early Childhood 3-6 years	Lower Elementary 6-9 years	Upper Elementary 9-12 years	Middle School 12-14 years
				Compare and contrast potential alternative energy sources Examine how society can balance the advancement of technology with the splendor of nature