Grade 7	Unit 1: Scientific Inquiry		Suggested Length: 1 week
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and Assessment Student will:
1. Explain how science is used in our everyday lives. 2. Compare how different Scientist uses the Scientific Method for problem solving. 3. Determine the best hypothesis for an experiment.	**Program of Studies** ❑ *S1-1 Identify questions that can be answered through scientific investigations combined with scientific information.* ❑ *SI-2 Use appropriate equipment (e.g., watches), tools (e.g., rain gauges), techniques (e.g., classifying), technology (e.g., calculators), and mathematics in scientific investigations.* ❑ *SI-3 Use evidence (e.g., classifications), logic, and scientific knowledge to develop scientific explanations.* ❑ *SI-4 Design and conduct different kinds of scientific investigations to answer different kinds of questions.* ❑ *SI-5 Communicate (e.g., draw, speak) designs, procedures, and results of scientific investigations.* ❑ *SI-6 Review and analyze scientific investigations and explanations of other students.* ❑ *7-AC-2 Describe the effects of science and technology on society.* ❑ *7-AC-1 Use Science to evaluate the risks and benefits to society for common activities (e.g., riding on airplanes and choice of habitation.)*	❑ Scientific work of ❑ Redi, Spallanzani, ❑ Pasteur, Oparin, ❑ Miller. ❑ Scientific method ❑ SI units of ❑ Measurement ❑ Lab Safety ❑ Technology ❑ State the Problem ❑ Hypothesis ❑ Experiment ❑ Data ❑ Conclusion ❑ Control	❑ Construct a graphic organizer on the scientific method. ❑ Create a definition for Science Inquiry. ❑ Hypothesize, experiment and record data for different experiments. ❑ Use different forms of media to research different scientist who used the scientific method to make their discoveries. ❑ Open Response: Scientific Inquiry

Grade 7	Unit 2: Characteristics of Living Things		Suggested Length: 1 week
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and Assessment Student will:
1. Describe the needs for all living things.	**Program of Studies** ❑ *6-LS-1 Investigate how organisms obtain and use resources, grow, reproduce, and maintain stable internal conditions*.	❑ Needs of living things. ❑ Characteristics of living things. ❑ Interaction of living	❑ Construct a graphic organizer listing the main characteristics of living things. ❑ Create a colleague of abiotic and biotic factors. ❑ Research how the body maintains homeostasis.

Grade 7	Unit 2: Characteristics of Living Things		Suggested Length: 1 week
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and Assessment Student will:
2. Explain where life comes from.	**Core Content** ❑ SC-06-3.5.2 Students will understand that regulation of an organism's internal environment involves sensing the internal environment and changing physiological activities to keep conditions within the range required to survive. Maintaining a stable internal environment is essential for an organism's survival.	and non-living things ❑ Homeostasis ❑ Spontaneous generation ❑ Redi ❑ Biogenesis ❑ Abiotic ❑ Biotic	❑ Open Response: Abiotic and Biotic Factors

Grade 7	Unit 3: Cytology		Suggested Length: 6 wks.
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and Assessment Student will:
1. Describe how a cell gets its energy. 2. Contrast plant and animal cell. 3. Compare the functions of cellular organelles.	**Program of Studies** ❑ *8-LS-1 Investigate structure (e.g. cells, tissues, organs) and function (e.g. growth, muscular function, digestion) in living systems.* **Core Content** ❑ **SC-06-3.4.1 Students will describe the relationship between cells, tissues, and organs in order to explain their function in multicellular organisms.** **Specialized cells perform specialized functions in multicellular organisms. Groups of specialized cells cooperate to form tissues. Different tissues are, in turn, grouped together to form larger functional units called organs. Examination of cells, tissues, and organs reveals that each type has a distinct structure and set of**	❑ Active transport ❑ Carbohydrates ❑ Cell Theory ❑ Cells ❑ Cellular Respiration ❑ Diffusion ❑ Equilibrium ❑ Eukaryotes ❑ Lipids ❑ Metabolism ❑ Mitosis ❑ Mutation ❑ Nucleic acids ❑ Organ systems ❑ Organelles ❑ Organism ❑ Organs ❑ Osmosis ❑ Passive transport ❑ Photosynthesis ❑ Prokaryote	❑ Using a microscope, contrast an animal cell, plant cell, and bacterial cell. ❑ Model the organelles present in plant and animal cells by drawing them, using coloring pencils and drawing paper. Using the Venn diagram, compare the organelles in the animal and plant cell. ❑ Construct a model of the animal cell using different forms of media. (e.g., Pasta, marshmallows, jellybeans etc.) ❑ Use different types of solutions, comparing the effects of Osmosis on an egg. ❑ Open Response**:** Cell Organelles ❑ Use yeast to demonstrate the products produced in fermentation respiration. ❑ Create a cell city, presenting analogies of organelles to different jobs performed in a city. (e.g., Nucleus is analogous to the Mayor of the city.) ❑ Create a model showing cellular differentiation using different types of media (e.g.. Clay, paper, pasta) ❑ Open Response**:** Aerobic and Anaerobic Respiration. ❑ Model the phases of mitosis by drawing and

Grade 7	Unit 3: Cytology		Suggested Length: 6 wks.
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and Assessment Student will:
	functions that serve the organism. DOK 3	❑ Proteins ❑ Replication ❑ Tissues	explaining what happens in each phase using coloring pencil and drawing paper. ❑ Model photosynthesis by using coloring pencils and paper, drawing a leaf, indicating what raw materials enter and leave the leaf, and what products are made.

Grade 7	Unit 4: Genetics		Suggested Length: 6 wks.
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and Assessment *Student will:*
1. Justify why we should study Genetics. 2. Analyze how traits and genetic disorders are passed from one generation to another. 3. Explain how genetics is used in modern medicine.	**Program of Studies** ❑ *7-LS-2 Investigate traits, heredity, and genes.* ❑ *8-LS-2 Analyze reproduction (e.g. asexual and sexual) and heredity (e.g. genetic information and genetic traits.* **Core Content** ❑ **SC-07-3.4.1 Students will** ❑ **describe the role of genes/chromosomes in the passing of information from one generation to another (heredity);** ❑ **compare inherited and learned traits.** **Every organism requires a set of instructions for specifying its traits. This information is contained in genes located in the chromosomes of each cell that can be illustrated through the use of models. Heredity is the passage of these instructions from one generation to another and should be distinguished from learned traits. DOK 2** ❑ **SC-07-3.4.2 Students will describe and compare sexual and asexual reproduction.**	❑ Alleles ❑ Asexual Reproduction ❑ Chromosome ❑ DNA ❑ Dominant Allele ❑ Egg ❑ Fertilization ❑ Gregor Mendel ❑ Gene ❑ Genetic Engineering ❑ Genetics ❑ Genotype ❑ Heredity ❑ Heterozygous ❑ Homozygous ❑ Incomplete Dominance ❑ Codominance ❑ Meiosis ❑ Mutation ❑ Pedigree ❑ Phenotype ❑ Punnett Square ❑ Recessive Allele ❑ RNA ❑ Sex-linked traits ❑ Sexual Reproduction ❑ Sperm	❑ Perform punnett squares, listing the probabilities of the offspring, the genotypes, phenotypes, and whether the offspring are heterozygous or homozygous. ❑ Complete the Project: "All in the Family." Use paper, scissors, glue, markers, coins, and materials such as glitter, sequins, buttons, yarn, and/or bead to decorate the 3 genetically created pets. First design the parents by choosing their phenotypes such as color of body, gender, eye shape, nose shape and teeth shape. Then design the offspring, making sure to get the right genotype and phenotype combination by looking at the genotype and phenotype of the parents. Next design a poster listing mom's, dad's, and the offspring's genotype and phenotype. Present the poster to the class, explaining all the gene combinations of the parents and how the offspring inherited its traits. ❑ Compare mitosis to meiosis by presenting a power point presentation. ❑ Design a model of the DNA molecule, making sure to have the sugar and phosphate combining making up the backbone of the molecule. Making sure the nitrogen bases, adenine combines with thymine, guanine combines with cytosine, making up the rungs of the DNA molecule. ❑ Model protein synthesis by drawing the process and explain how proteins are made. ❑ Open Response: Heredity

Grade 7	Unit 4: Genetics		Suggested Length: 6 wks.
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and Assessment *Student will:*
	Reproduction is a characteristic of all living systems and is essential to the continuation of every species as evidenced through observable patterns. A distinction should be made between organisms that reproduce asexually, and those that reproduce sexually. In species that reproduce sexually, including humans and plants, male and female sex cells carrying genetic information unite to begin the development of a new individual. DOK 2		❑ Research a genetic disorder looking for the following information: the definition, the cause, the effects, testing procedures to see if you have the disorder, life expectancy, any physical changes due to having the disorder, in what country is it predominantly found, medical procedures available, and where a person could go to get help for this disorder. (WP-Transactive). ❑ Design a poster with the information obtained from the researched genetic disorder use in the portfolio entry.

Grade 7	Unit 5: Ecology		Suggested Length: 6 wks.
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and Assessment Student will:
1. Identify how organisms reaction with each other. 2. Describe ways that nonliving factors affect organisms in an ecosystem. 3. Compare how different organisms affect their environment.	**Program of Studies** ❑ *8-LS-4 Investigate and analyze population and ecosystems.* ❑ *6-LS-5 Investigate factors (e.g., resources, light, water) that affect the number of organisms an ecosystem can support.* ❑ *6-LS-4 Investigate energy flow in ecosystems* ❑ *6-LS-3 Observe populations and determine the function organisms serve in an ecosystem* **Core Content** ❑ **SC-06-4.7.1 Students will describe the consequences of change in one or more abiotic factors on a population within an ecosystem.** **The number of organisms an ecosystem can support depends on the resources available**	❑ Abiotic Factors ❑ Biomes ❑ Biosphere ❑ Biotic Factors ❑ Carbon Cycle ❑ Carnivore ❑ Community ❑ Competition ❑ Consumer ❑ Decompose ❑ Ecosystem ❑ Energy Pyramid ❑ Food Chain ❑ Food Web ❑ Greenhouse Effect ❑ Habitat ❑ Herbivore ❑ Limiting Factor ❑ Mark and Recapture	❑ Design a model of an ecosystem using different types of media. (e.g., Styrofoam, plastic figurines, clay, etc.) Label each part of the ecosystem.(e.g., Organism, Population, Community, Ecosystem). ❑ Using pictures of turtles, monitor the population using the mark and capture release technique. Graph the results. ❑ Open Response: Symbiosis ❑ Design an Energy Pyramid by displaying different plants and animals in the pyramid on a poster. Calculate the amount of energy use by the organism and the amount of energy passed on to its consumer. Label the producers, 1st level, 2nd level, and 3rd level consumers, the source of energy, and the decomposers. ❑ Research one of the five habitats, grasslands, temperate forest, tropical forest, desert, polar ice, or tide pools. Give a physical description of the habitat, example of the habitat (Geographical Locations), and examples of the animals and plants that live in the habitat.

Grade 7	Unit 5: Ecology		Suggested Length: 6 wks.
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and Assessment Student will:
	and abiotic factors (e.g., quantity of light and water, range of temperatures, soil composition). DOK 2	❑ Natural Resource ❑ Niche ❑ Nitrogen Cycle ❑ Nonrenewable ❑ Omnivore ❑ Pollution ❑ Population ❑ Population Density ❑ Predator/Prey ❑ Producers ❑ Recycling ❑ Autotroph/Hetertroph ❑ Species ❑ Symbiosi	❑ Explain how the plants and animals have adapted to their habitat. Examine and analyze the limiting factors present in each ecosystem. ❑ Design a food web listing the autotrophs, hetertrophs, predator, prey, producer, carnivore, herbivore, omnivore, and the decomposers.

Grade 7	Unit 6: Evolution		Suggested Length: 1 week
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and Assessment Student will:
1. Explain the theory of evolution. 2. Justify the process of evolution with evidence to support it.	**Program of Studies** ❑ *7-LS-3 Investigate unity among organisms.* ❑ *7-LS-4 Investigate biological adaptation and extinction.* **Core Content** ❑ **SC-07-3.5.1 Students will:** ❑ **describe the usefulness of fossil information to make conclusions about past life forms and environmental conditions;** ❑ **explain the cause and effect relationship of the extinction of a species and environmental changes.** **Extinction of species is common and occurs**	❑ Species ❑ Evolution ❑ Natural Selection ❑ Extinction ❑ Endangered species	❑ After watching the film, "Life on Earth," explain how man has evolved, starting with the first signs of life on Earth to present day. ❑ Participate in a debate on Creation vs. Evolution. ❑ Open Response: Creation vs. Evolution

Grade 7	Unit 6: Evolution		Suggested Length: 1 week
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and Assessment Student will:
	when the adaptive characteristics of a species are insufficient to allow its survival. Most of the species that have lived on Earth no longer exist. Fossils provide evidence of how environmental conditions and life have changed. DOK 3		

Grade 7	Unit 7**:** Taxonomy		Suggested Length: 1 wk.
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and Assessment Student will:
1. Explain how to distinguish one organism from another. 2. Discuss why scientists classify living organisms.	**Program of Studies** ❑ *7-LS-3 Investigate unity among organisms.* ❑ *7-LS-4 Investigate biological adaptations and extinction.* **Core Content** ❑ **SC-07-3.5.1 Students will:** ❑ **describe the usefulness of fossil information to make conclusions about past life forms and environmental conditions;** ❑ **explain the cause and effect relationship of the extinction of a species and environmental changes.** **Extinction of species is common and occurs when the adaptive characteristics of a species are insufficient to allow its survival. Most of the species that have lived on Earth no longer exist. Fossils provide evidence of how environmental conditions and life have changed. DOK 3**	❑ Classification ❑ Binomial Nomenclature ❑ Archaebacteria ❑ Eubacteria ❑ Genus ❑ Species ❑ Taxonomy ❑ Kingdom ❑ Phylum ❑ Class ❑ Order ❑ Family ❑ Fungi ❑ Moneran ❑ Animalia ❑ Plantae ❑ Fungi	❑ Using common objects (different kinds of beans, jelly beans, white marshmallows, colored marshmallows, etc.) classify the objects by their similar characteristics. ❑ Using a Dichotomous Key, identify the different kinds of protozoans. ❑ Research an organism and construct a poster showing the complete classification of the organism from Kingdom to Species. ❑ Open Response**:** Binomial Nomenclature.

Grade 7	Unit 8: Virology/Monera/Protista/Fungi/Plantae/Animalia		Suggested Length: 6 wks**.**
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and <u>Assessment</u> Student will:
1. List the characteristics of each organism. 2. Compare the different species. 3. Explain how each organism reproduces.	**<u>Program of Studies</u>** ❑ *6-LS-1 Investigate how organisms obtain and use resources, grow, reproduce, and maintain stable internal conditions. Examine the regulation of an organism's internal environment.* ❑ *6-LS-2 Analyze internal or environmental stimuli and organisms' behavioral responses. Explore how organisms' behavior changes through adaptation.* ❑ 8-LS-3 *Analyze regulation and behavior.* ❑ *8-LS-5 Analyze diversity and adaptation. Biological change over time account for the diversity of species developed through gradual processes over many generations. Biological adaptations include changes in structures, behavior, or physiology that enhance survival and reproductive success in a particular environment.* ❑ *7-LS-1 Contrast asexual and sexual reproduction* ❑ *8-LS-2 Analyze Reproduction.* **<u>Core Content</u>** ❑ **SC-06-3.4.2 Students will make inferences about the factors influencing behavior based on data/evidence of various organism's behaviors.** **Behavior is one kind of response an organism may make to an internal or environmental stimulus. Observations of organisms, data collection/analysis, support generalizations/conclusions that a behavioral response is a set of actions determined in part by heredity and in part**	❑ Virus ❑ AIDS ❑ Parasite ❑ Host ❑ Pathogen ❑ Vaccine ❑ Toxin ❑ Aerobes ❑ Anaerobes ❑ Antibiotic ❑ Cilia ❑ Fission ❑ Flagellum ❑ Nitrogen Fixing ❑ Bacteria ❑ Algae ❑ Protozoans ❑ Pseudopods ❑ Saprophyte ❑ Club fung ❑ Decomposers ❑ Fungi ❑ Hyphae ❑ Imperfect Fungi ❑ Lichen ❑ Mold ❑ Mycelium ❑ Sac fungi ❑ Sporangia ❑ Spore ❑ Angiosperm ❑ Cambium layer ❑ Cellular respiration ❑ Chlorophyll ❑ Cotyledon	❑ Model the reproduction of the virus using paper and coloring pencils. Explain how the virus reproduces. ❑ Research a viral disease: explain the cause of the disease, symptoms of the disease, and treatments or cures for the disease. ❑ Open Response**:** <u>Viruses</u> ❑ Model the reproduction of the bacteria using paper and coloring pencils. Explain how the bacteria reproduce. ❑ Research a bacterial disease: explain the cause of the disease, symptoms of the disease, and treatments or cures for the disease. ❑ Open Response: <u>Bacteria.</u> ❑ Model the reproduction different protista using paper and coloring pencils. Explain how the protista reproduces. ❑ Research a protozoan disease: explain the cause of the disease, symptoms of the disease, and treatments or cures for the disease. ❑ Open Response**:** <u>Protista.</u> ❑ Model the reproduction of the fungi using paper and coloring pencils. Explain how the fungi reproduce. ❑ Research a fungal disease: explain the cause of the disease, symptoms of the disease, and treatments or cures for the disease. ❑ Open Response: <u>Fungi.</u> ❑ Create a three-dimensional model of a plant showing the leaves, root, stem, and the male/female sex organs. ❑ Dissect seeds (Lima bean and Corn) comparing their structures. ❑ Using the cross section of a large tree, investigate the sapwood, hard wood, bark, cambium layer, and the age of the tree. Research and report the historical events that happen each year from these growth rings. ❑ Collect different tree leaves and identify what tree they came their origin. ❑ Research the importance of different trees (e.g. lumbar, furniture, ball bats. etc.) from their environment.

Grade 7	Unit 8: Virology/Monera/Protista/Fungi/Plantae/Animalia		Suggested Length: 6 wks.
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and Assessment Student will:
	from experience. A behavioral response requires coordination and communication at many levels including cells, organ systems, and organisms. DOK 2 ❑ **SC-06-3.5.1 Students will explain that biological change over time accounts for the diversity of species developed through gradual processes over many generations.** **Biological adaptations include changes in structures, behaviors, or physiology that enhance survival and reproductive success in a particular environment. DOK 2** ❑ SC-06-3.5.2 Students will understand that regulation of an organism's internal environment involves sensing the internal environment and changing physiological activities to keep conditions within the range required to survive. Maintaining a stable internal environment is essential for an organism's survival. ❑ **SC-07-3.5.1 Students will:** ❑ **describe the usefulness of fossil information to make conclusions about past life forms and environmental conditions;** ❑ **explain the cause and effect relationship of the extinction of a species and environmental changes.** **Extinction of species is common and occurs when the adaptive characteristics of a species are insufficient to allow its survival. Most of the species that have lived on Earth no longer exist. Fossils provide evidence of how environmental conditions and life have**		❑ Research why some plants have modified leaves, such as thorns, sepals, needles, etc. ❑ Design an experiment showing phototropism in plants. ❑ Open Response: Plantae ❑ Dissect different invertebrates, observing their structures. ❑ Create a butterfly garden, researching the types of plants butterflies are attracted too. Create a brochure, describing how to create a butterfly garden. (WP-Transactive) ❑ Collect insects and identify what family it belongs too. ❑ Construct an ecosystem (e.g. aquarium, terrarium, compost). ❑ Describe the interaction between the abiotic and biotic factors. ❑ Conduct an experiment; investigating how light affects different invertebrates. ❑ Research on different invertebrates can cause diseases. ❑ Open Response: Animalia

Grade 7	Unit 8: Virology/Monera/Protista/Fungi/Plantae/Animalia		Suggested Length: 6 wks.
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and Assessment Student will:
	changed. DOK 3 ❑ **SC-07-3.4.2 Students will describe and compare sexual and asexual reproduction.** **Reproduction is a characteristic of all living systems and is essential to the continuation of every species as evidenced through observable patterns. A distinction should be made between organisms that reproduce asexually, and those that reproduce sexually. In species that reproduce sexually, including humans and plants, male and female sex cells carrying genetic information unite to begin the development of a new individual. DOK 2** ❑ **SC-07-4.7.1 Students will compare abiotic and biotic factors in an ecosystem in order to explain consequences of change in one or more factors.** **The number of organisms an ecosystem can support depends on the resources available and abiotic factors (e.g., quantity of light and water, range of temperatures, soil composition). Given adequate biotic and abiotic resources and no diseases or predators, populations (including humans) increase at rapid rates. Lack of resources and other factors, such as predation and climate, limit the growth of populations in specific niches in the ecosystem. DOK 3**		