Science: Seventh Grade

In seventh grade integrated science, students will explore 4 different areas of science. Our major units will be the nature of science, cellular biology, ecology, and geology. Students will learn about living organisms, their composition, and their relationships with biotic and abiotic components of an ecosystem. Topics of study include cells, cellular processes, genetics, taxonomy, biodiversity, and ecology. In addition, students will also learn about the geologic processes that have and continue to shape and change our planet. Topics of study include fossils, geologic time, rocks, plate tectonics, and weathering.

Course Information:

Frequency & Duration: 43 minutes; 5 periods per week; full year

Text: Person Prentice Hall Science Explorer. Upper Saddle River, NJ: Pearson Prentice Hall. Select bind books: Cells and Heredity, Environmental Science, and Inside Earth.

Science: Seventh Grade

Content: Nature of Science **Duration:** (4 weeks)

Essential Question:	What process is used to design an experiment to test a question? What do scientists do to find out more about our world and how it functions?
Skill:	• Design and conduct a scientific investigation and understand that current scientific knowledge guides scientific investigations. • Identify questions that can be answered through scientific investigations and evaluate the appropriateness of questions.
Instructional/Engagement Activities	
Assessment:	• Given an example of an experiment, students are able to identify, describe, and understand the various components of the scientific method.
Resources:	Teacher generated laboratory investigation
Standards:	3.1.7A9 Science as Inquiry S8.A.1.1.2 Explain how certain questions can be answered through scientific inquiry and/or technological design. 3.2.5.A6 Use appropriate tools and technologies to gather, analyze, and interpret data and understand that it enhances accuracy and allows scientists to analyze and quantify results of investigations.

Vocabulary:

Controlled Experiment- a test of a hypothesis under a set of conditions; **Dependent Variable-** the responding variable that changes because of the manipulated variable; **Engineer-** person who is trained to use both technological and scientific knowledge to solve practical problems; **Hypothesis-** possible explanation for a set of observations; **Independent Variable-** the manipulated variable in an experiment; **Inferring**- explaining or interpreting observations; **Inquiry**- the many ways in which scientists study the natural world and propose explanations based on the evidence they gather; **Observing-** using one or more senses to gather information; **Predicting-** forecasting what will happen in the future based on past experiences or evidence; **Science**- a way of learning about the natural world; **Scientific Theory-** well-tested concept that explains a set of observations; **Scientific Law-** what scientists expect to happen every time under a set of conditions; **Technology-** how people change the world around them to meet needs or to solve problems; **Variable**- one of the factors that change an experiment

Comments

Content: Characteristics of Living Things **Duration:** (2 weeks)

Essential Question:	What is the cell theory? What characteristics do all living things share? Where do living things come from? What characteristics separate living organisms from non-living organisms? What characteristics are used to classify organisms?
Skill:	• Explain that the cell is the basic unit of structure and function for all living things. • Compare and contrast characteristics of living things • Explain that living organisms are made up of one or more cells and carry out life functions.
Instructional/Engagement Activities	
Assessment:	• Given a picture of a cell, students can explain how the cell is the basic unit of structure and function for all living things. • Given a living organism, students will describe what it is made of and provide examples of how the organism carries out life functions.
Resources:	Teacher generated activities.
Standards:	3.1.7.A5. Explain how the cell is the basic structural and functional unit of living things. 3.1.6.A4. Recognize that all organisms are composed of cells and that many organisms are unicellular and must carry out all life functions in one cell. 3.1.7.A4. Explain how cells arise from pre-existing cells. S8.A.3.1.2. Explain the concept of order in a system [e.g., (first to last); (simple to complex: cell, tissue, organ, organ system)]. S8.B.1.1.4. Identify the levels of organization from cell to organism and describe how specific structures (parts), which underlie larger systems, enable the system to function as a whole.
Vocabulary:	**Cell Theory**- a widely accepted explanation of the relationship between cells and living things; **Autotroph**- an organism that makes its own food; **Cell**- the basic unit of structure and function in living things; **Development**- the process of change that occurs during an organism's life to produce a more complex organism; **Heterotroph**- an organism that cannot make its own

food; **Homeostasis**- the maintenance of stable, internal conditions in an organism; **Multicellular**- consisting of many cells; **Organism**- a living thing; **Response**- an action or change in behavior that occurs in reaction to a stimulus; **Spontaneous generation**- the mistaken idea that living things arise from non-living sources; **Stimulus**- a change in an organism's surroundings that causes the organism to react; **Unicellular**- made of a single cell

Comments

Content: Cell Structure and Organelle Function **Duration:** (2 weeks)

Essential Question:	What organelles are found in various cells? How do organelles aid the functioning of a cell as a whole?
Skill:	• Explain how organisms can be either unicellular or multicellular • Explain the levels of organization within an organism. • Explain the size and scale of cells. • Explain how a cell is visible through a microscope.
Instructional/Engagement Activities	
Assessment:	• Given a list of organisms, students will identify whether they are unicellular or multicellular. • Given various organisms, students will describe the levels of organization from cell to organism. • Given an example of a cell, students will explain why most cells are visible only through a microscope.
Resources:	Prentice Hall Cells and Heredity (Pages 6-30) Teacher generated activities.
Standards:	3.1.6.A6. Identify examples of unicellular and multicellular organisms. 3.1.7.A6. Identify the levels of organization from cell to organism. 3.1.6.A8. SCALE Explain why the details of most cells are visible only through a microscope. S8.A.2.2.3. Describe ways technology (e.g., microscope, telescope, micrometer, hydraulics, barometer) extends and enhances human abilities for specific purposes
Vocabulary:	**Microscope**- an instrument that makes small objects look larger; **Organelle**- a tiny cell structure that carries out a specific function within the cell; **Organic Compounds**- compounds that contain carbon; **Inorganic Compunds-** compounds that do not contain carbon; **DNA-** the genetic material that carries information about an organism and is passed from

parents to offspring; **RNA-** plays an important role in the production of protein.

Comments

Content: Cellular Processes **Duration:** (2 weeks)

Essential Question:	How does a cell interact with its environment?
Skill:	• Describe how energy derived from the sun is used by plants to produce sugars (photosynthesis) and is transferred within a food chain from producers (plants) to consumers to decomposers. • Explain similarities between life processes at an organism and cellular level. • Explain biogeochemical cycles within an ecosystem. (photosynthesis & respiration) • Describe the structures plants use to make food. • Describe the structures animals use to find food.
Instructional/Engagement Activities	
Assessment:	• Given a list of life processes, students will compare those at the organism vs. cellular level. • Given a plant, students will identify structures used in the production of food and plant reproduction. • Students will illustrate biogeochemical cycles within an ecosystem.
Resources:	Prentice Hall Genetics and Heredity (Pages 32-67) Teacher generated activities
Standards:	3.1.6.A2. Describe how energy derived from the sun is used by plants to produce sugars (photosynthesis) and is transferred within a food chain from producers (plants) to consumers to decomposers 3.1.6.A5. Describe basic structures that plants and animals have that contribute to their ability to make or find food and reproduce. 3.1.7.A7. Compare life processes (e.g. growth, digestion) at the organism level with life processes at the cellular level. 4.1.7.B. Explain biogeochemical cycles within an ecosystem. (See Science and Technology: 3.3.7.A1.)
Vocabulary:	**Active Transport-** the movement of materials through a cell membrane using the cell's energy; **Cell Cycle-** the regular sequence of growth and division that cells undergo; **Chromosome**- a doubled rod of condensed chromatin; **Compound-** two or more elements that are chemically combined; **Cytokinesis**-final stage of the

cell cycle in which the cell's cytoplasm divides; **DNA-** genetic material that carries information about an organism and is passed from parent to offspring; **Diffusion-** the process by which molecules move from an area of higher concentration to an area of lower concentration;
Element- any substance that cannot be broken down into simpler substances; **Interphase-** the stage of the cell cycle that takes place before cell division occurs
Mitosis- the stage of the cell cycle during which the cell's nucleus divides into two new nuclei and one copy of the DNA is distributed into each daughter cell; **Osmosis-** the diffusion of water molecules through a selectively permeable membrane; **Passive Transport-** the movement of materials through a cell membrane without using the cell's energy; **Photosynthesis-** the process in which some organisms use water along with sunlight and carbon dioxide to make their own food; **Respiration-** the process by which cells break down simple food molecules to release the energy they contain; **Selectively Permeable-** a property of cell membranes that allows some substances to pass through, while others cannot; **Cancer-** a disease in which some body cells grow and divide uncontrollably.

Comments

Content: Genetics **Duration:** (3 weeks)

Essential Question:	How is genetic information inherited and expressed?
Skill:	• Explain how traits are inherited from parents. • Explain Mendelian Patterns of Inheritance. • Describe selective breeding and biotechnology as ways to alter the genetic composition of an organism.
Instructional/Engagement Activities	
Assessment:	• Given an organism's traits, students will explain how the traits are passed using Mendel's Patterns of Inheritance. • Given a scenario, students will identify ways selective breeding and biotechnology are used to alter the genetic composition of organisms.
Resources:	Prentice Hall Cells and Heredity (Pages 76-103) Teacher generated activities
Standards:	3.1.7.B1. Explain how genetic instructions influence inherited traits. Identify Mendelian patterns of inheritance. 3.1.7.B4. Describe how selective breeding and biotechnology can alter the genetic composition of organisms.
Vocabulary:	**Allele**- the different forms of a gene; **Codominance**- a condition in which neither of the two alleles of a gene is dominant or recessive; **Dominant Allele**- an allele whose trait always shows up in the organism when the allele if present; **Fertilization**- the joining of a sperm and egg; **Gene**- the set of information that controls a trait; **Genetic Disorder**- an abnormal condition that a person inherits through genes or chromosomes; **Genetic Engineering**- a transfer of a gene from the DNA of one organism into another organism, in order to produce an organism with the desired traits; **Genetics**-the scientific study of heredity; **Genotype**- an organism's genetic makeup; **Heredity**- passing of traits from parent to offspring;

Heterozygous- having two different alleles for a trait; **Homozygous**- having two identical alleles for a trait; **Hybrid**- an organism that has two different alleles for a trait; **Phenotype**- an organism's physical appearance; **Probability**-a number that describes how likely it is that an event will occur; **Punnett Square**- a chart that shows all the possible combinations of alleles that can result from a genetic cross; **Purebred**- the offspring of many generations that have the same traits; **Recessive Allele**- an allele that is masked when a dominant allele is present; **Selective Breeding**- the process of selecting a few organisms with desired traits to serve as parents of the next generation; **Trait**- a characteristic that an organism can pass on to its offspring through its genes

Comments

Content: Diversity of Life: Organisms **Duration:** (5 weeks)

Essential Question:	What factors affect an organism's ability to meet its needs?
Skill:	• Compare and contrast structural and functional characteristics of bacteria, protists, fungi, plants, and animals. • Identify the stages of a life cycle for different living organisms. • Describe the structures plants and animals use to reproduce. • Explain the similarities and differences between asexual and sexual reproduction. • Identify physical characteristics of an organism. • Compare and contrast physical characteristics among different organisms.
Instructional/Engagement Activities	
Assessment:	• Given a group of diverse organisms, students will identify similarities and differences between organisms. • Given an adult organism, students will identify the stages of its life cycle. • Given an animal, students will identify structures used to find food and animal reproduction. • Given an asexually reproducing organism and a sexually-reproducing organism, students will compare the two methods of reproduction. • Given physical characteristics of organisms, students will compare and contrast patterns in the physical characteristics among different organisms.
Resources:	Teacher generated activities
Standards:	3.1.6.A1. Describe the similarities and differences of major physical characteristics in plants, animals, fungi, protists, and bacteria. 3.1.7.A1. Describe the similarities and differences of physical characteristics in diverse organisms. 3.1.7.A3. Explain why the life cycles of different organisms have varied lengths. 3.1.7.B2. Compare sexual reproduction with asexual reproduction. 3.1.7 B5. PATTERNS Compare and contrast observable patterns in the physical characteristics across families, strains, and species.
Vocabulary:	**Asexual Reproduction**- a reproductive process that involves only one parent and produces offspring that are identical to the parent; **Bacteria**- single-celled organisms that lack a nucleus, prokaryotes; **Fungi**- a eukaryotic organism that has cell walls, uses spores to reproduce, and is a heterotroph that feeds by absorbing its food; **Protist**- a eukaryotic organism that cannot

be classified as an animal, plant, or fungus; **Sexual Reproduction**- a reproductive process that involves two parents that combine their genetic information to produce a new organism, which differs from both parents; **Virus**- a tiny, non-living particle that invades and then reproduces inside a living cell; **Plant-** a multicellular autotroph with a cell wall made from cellulose; **Animal-** a multicellular heterotroph that breathes oxygen and can move at some point in their life cycle; **Amphibian-** an ectothermic vertebrate that spends its early life in the water and its adult life on land; **Arthropod-** an invertebrate that has an external skeleton**,** a segmented body, and jointed appendages; **Bird-** an endothermic vertebrate that has feathers and four-chambered heart, and lays eggs; **Chordate-** the phylum whose members have a notochord, a nerve chord, and slits in their throat at some point in their lives; **Cnidarian-** an invertebrate animal that uses stinging cells to capture food and defend itself; **Echinoderm-** a radially symmetrical invertebrate that lives on the ocean floor and has an internal skeleton and a water vascular system; **Fish-** a vertebrate that lives in the water and has fins; **Insect-** an arthropod with three body sections, six legs, one pair of antennae, and usually one or two pairs of wings; **Mammal-** an endothermic vertebrate with a four-chambered heart, skin covered with hair or fur, and young fed with milk from the mother's body; **Mollusk-** an invertebrate with a soft, unsegmented body; most are protected by a hard, outer shell; **Reptile-** an ectothermic vertebrate that has lungs and scaly skin

Comments

Content: Diversity of Life: Evolution **Duration:** (2 weeks)

Essential Question:	How do adaptations enable an organism to survive and what role does adaptation play in the evolution of life?
Skill:	• Compare instinctive animal behaviors and learned animal behaviors. • Identify the mechanisms that organisms use to adapt to their environment. • Identify appropriate models to show how organisms interact in an environment. • Identify elements of natural selection leading to a population's ability to adapt to change. • Identify elements of natural selection within a successful population. • Explain how an adaptation is an inherited, structure, function, or behavior that helps an organism survive and reproduce. • Use evidence from geology, fossils, and comparative anatomy to support the theory of evolution. • Recognize that adaptations are needed in order to save a species from extinction.
Instructional/Engagement Activities	
Assessment:	• Given a scenario, students will explain what types of animal behaviors were exhibited. • Given a list of organisms, students will identify the mechanisms those organisms use to adapt to the environment. • Given data, students will identify possible elements of natural selection leading to changes in population. • Given a scenario, students will identify elements of natural selection leading to a successful population. • Given an organism, students will identify an adaptation and whether it is an adaptation that is inherited, structural, functional, or behavioral adaptation. • Given fossil evidence, students will be able to draw conclusions to support the theory of evolution. • Research a species that has become extinct and identify the causes and consequences of the extinction.
Resources:	Prentice Hall Cells and Heredity (Pages 138-145) Teacher generated activities

Standards:	3.1.6.C1. Differentiate between instinctive and learned animal behaviors that relate to survival. 3.1.7.A8. MODELS Apply the appropriate models to show interactions among organisms in an environment. 3.1.7.C1. Describe how natural selection is an underlying factor in a population's ability to adapt to changes. 3.1.8.A8. CHANGE AND CONSTANCY Explain mechanisms organisms use to adapt to their environment. 3.1.8.C1. Explain how reproductive success coupled with advantageous traits over many generations contributes to natural selection. 4.1.7.D. Explain how an adaptation is an inherited, structure, function, or behavior that helps an organism survive and reproduce. 3.1.7.C2. Explain why the extinction of a species may occur when the environment changes. Explain that mutations can alter a gene and are the original source of new variations in a population. 3.1.7.C3. CONSTANCY AND CHANGE Identify evidence drawn from geology, fossils, and comparative anatomy that provides the basis for the theory of evolution. 4.1.8.D. Use the theory of natural selection to examine the causes and consequences of extinction.
Vocabulary:	**Adaptation-** a behavior or physical characteristic that allows an organism to survive or reproduce in its environment; **Evolution**- the gradual change in a species over time; **Evolutionary (Phylogenetic) Tree -** a diagram showing the evolutionary interrelations of a group of organisms derived from a common ancestral form; **Fossil**- the preserved remains or traces of living things; **Gradualism**- theory that proposes that evolution occurs slowly but steadily; **Natural Selection**- the process by which individuals that are better adapted to their environment are more likely to survive and reproduce than other members of the same species; **Scientific Theory**- a well-tested concept that explains a wide range of observation; **Species**- a group of similar organisms that can mate with each other and produce fertile offspring; **Variation**- any difference between individuals of the same species

Comments

Content: Populations and Communities **Duration:** (2 weeks)

Essential Question:	What allows some populations or organisms to change and survive while others cannot?
Skill:	• Identify biotic and abiotic components of an ecosystem. • Describe symbiotic and predator/prey relationships. • Explain the processes of primary and secondary succession in a given ecosystem.
Instructional/Engagement Activities	
Assessment:	• Given a diagram, students will identify biotic and abiotic components of the ecosystem. • Given an example of organisms interacting, students will identify the appropriate model to illustrate the interaction. • Given a scenario, students describe elements of a symbiotic relationship. • Given a scenario, students will identify factors, including the type of succession if applicable, that contribute to change in natural and human-made systems.
Resources:	Prentice Hall Environmental Science (pages 4-35) Teacher generated activities
Standards:	4.1.7.A. Describe the relationships between biotic and abiotic components of an ecosystem. 4.1.7A. Describe symbiotic and predator/prey relationships. 4.1.7E. Explain the processes of primary and secondary succession in a given ecosystem.
Vocabulary:	**Abiotic Factor**- a non-living part of an organism's habitat; **Biotic Factor**- a living part of an organism's habitat; **Community**- all the different populations that live together in an area; **Limiting Factor**- an environmental factor that prevents a population from increasing; **Niche**- the role of an organism in its habitat, or how it makes its living; **Population**- all the members of one species in a particular area; **Succession**- the series of predictable changes that occur in a community over time **Symbiosis-** a close relationship between two species that benefits at least one of the species; **Mutualism-** a relationship between two species in which both benefit; **Commensalism-** a relationship between two species in which one benefits and the other is neither helped nor harmed; **Parasitism-** a relationship

between two species in which one benefits while the other is harmed; **Birth rate-** the number of births in a population in a certain amount of time; **Death rate-** the number of deaths in a population in a certain amount of time; **Emigration-** leaving a population; **Immigration-** moving into a population. **Species-** a group of organisms that are physically similar and can mate with each other and produce offspring that can also mate and reproduce.

Comments

Content: Energy Flow in an Ecosystem **Duration:** (2 weeks)

Essential Question:	How does energy flow support organisms in an ecosystem?
Skill:	• Explain the flow of energy within an ecosystem. • Compare and contrast the flow of energy between organisms in different habitats. • Explain the concept of trophic levels.
Instructional/Engagement Activities	
Assessment:	• Given an ecosystem scenario, students will explain the flow of energy through trophic levels.
Resources:	Prentice Hall Environmental Science Pages (42-47) Teacher generated activities
Standards:	4.1.7.C. Explain the flow of energy within an ecosystem. 4.1.7C. Compare and contrast the flow of energy between organisms in different habitats. 4.1.7C. Explain the concept of trophic levels.
Vocabulary:	**Consumer-** an organism that obtains energy by feeding on other organisms; **Decomposer-** an organism that breaks down chemicals from wastes and dead organisms, and returns important materials to the soil and water; **Energy Pyramid-** a diagram that shows the amount of energy that moves from one feeding level to another in a food web; **Food Chain-** a series of events in which one organism eats another and obtains energy; **Food Web-** the pattern of overlapping food chains in an ecosystem; **Producer-** an organism that can make its own food. **Herbivore-** a consumer that eats only plants; **Carnivore-** a consumer that eats only animals; **Omnivore-** a consumer that eats both plants and animals; **Heterotroph-** an organism that cannot make its own food; **Autotroph**- an organism that makes its own food

Comments:

Content: Ecosystems and Biomes **Duration:** (2 weeks)

Essential Question:	How do ecosystems differ and change over time?
Skill:	• List the names of various biomes and their characteristics. • Explain the primary functions of a wetland within a watershed. • Explain the value of wetlands to other living things.
Instructional/Engagement Activities	
Assessment:	• Given the name of a specific biome, students illustrate the appropriate characteristics. • Given a scenario, students will explain the benefits of a wetland to the watershed it is located in. • Given a scenario, students will explain the value of a wetland to the living things in, on, or around it.
Resources:	Prentice Hall Environmental Science (Pages 54-73) Teacher generated activities
Standards:	4.1.7A. Compare and contrast different biomes and their characteristics. 4.2.7.B. Explain the primary functions of a wetland within a watershed. 4.2.8.B. Explain the value of wetlands to other living things.
Vocabulary:	**Biogeography-** the study of where organisms live; **Biome-** a group of land ecosystems with similar climates and organisms; **Ecosystem-** the community of organisms that live in a particular area, along with their non-living surroundings; **Climate**- the typical weather pattern in an area over a long period of time

Comments

Content: Biodiversity **Duration:** (2 weeks)

Essential Question:	What allows some populations of organisms to change and survive while others cannot?
Skill:	• Identify reasons why organisms become threatened, endangered, and extinct. • Explain how biological diversity relates to the viability of ecosystems. • Compare and contrast monoculture with diverse ecosystems. • Explain how biological diversity relates to the ability of an ecosystem to adapt to change. • Identify factors that contribute to change in natural and human-made systems. • Describe how a diversity index is used to assess water quality. • Explain how Best Management Practices (BMP) can be used to mitigate environmental problems. • Describe the impact of pests in different geographic locations and techniques used to manage those pests.
Instructional/Engagement Activities	
Assessment:	• Given an ecosystem scenario, students will identify reasons why organisms become threatened, endangered, and extinct. • Given an ecosystem scenario, students will describe the level of biological diversity present and how it relates to the viability of the ecosystem. • Given scientific tools, students will assess biological diversity of water quality. • Given an environmental problem, students will suggest a BMP to mitigate the problem. • Given a scenario, students will describe the impact of pests and techniques used to manage those pests.
Resources:	Prentice Hall Environmental Science (Pages 95-105) Teacher generated activities
Standards:	4.1.7.E. Identify factors that contribute to change in natural and human-made systems. 4.2.8.C. Describe how a diversity index is used to assess water quality. 4.1.6.D. Identify reasons why organisms become threatened, endangered, and extinct 4.1.7.D. Explain how biological diversity relates to the viability of ecosystems. 4.1.7D. Compare and contrast monoculture with diverse ecosystems. 4.1.7D. Explain how biological diversity relates to the ability of an ecosystem to adapt to change. 4.5.8.A. Explain how Best Management Practices (BMP) can be used to

	mitigate environmental problems. 4.5.7.B. Describe the impact of pests in different geographic locations and techniques used to manage those pests.
Vocabulary:	**Biodiversity-** the number of different species in an area; **Endangered species-** a species in danger of becoming extinct in the near future; **Threatened species**- a species that could become endangered in the near future; **Extinction**- the disappearance of all members of a species from Earth

Comments

Content: Fossils and Geologic Time **Duration:** (3 weeks)

Essential Question:	Why is the fossil record an important tool in understanding Earth's history? How are biologic and geologic events interrelated?
Skill:	• Use evidence to support the theory that Earth has evolved geologically, over time. • Explain how matter is conserved in various geological processes.
Instructional/Engagement Activities	
Assessment:	• Given a series of significant geologic events, students will show how the Earth has changed over time. • Given a diagram of a geological process(es) explain how matter is conserved (changed over time). • Students will describe how major geologic events occurred due to Earth's processes.
Resources:	Prentice Hall Cells and Heredity (pages 155-163) Teacher generated activities
Standards:	3.3.7.A3. Explain and give examples of how physical evidence, such as fossils and surface features of glaciation support theories that the Earth has evolved over geologic time. Compare geologic processes over time. 3.3.8.A3. Explain how matter on Earth is conserved throughout the geological processes over time. 3.3.7.A6. CONSTANCY/ CHANGE SCALE Describe geologic time as it relates to Earth processes. 3.3.6.A6. MODELS/SCALES Describe the scales involved in characterizing Earth and its atmosphere.
Vocabulary:	**Absolute Age**- number of years since the rock formed; **Carbon Films-** thin coating of carbon on rock; **Cast-** solid copy of the shape of an organism; **Eras-** large units of geological time; **Extrusion**- hardened lava on the surface; **Faults-** breaks in the Earth's crust; **Fossils-** preserved remains of once living things; **Geologic Time Scale**- a record of the life forms and geologic events in Earth's history; **Half-Life-** of a radioactive element is the time it takes for half (50%) of the atoms to decay; **Index Fossils**- help

geologists determine the relative age of rocks; **Intrusion**- hardened magma beneath the surface; **Law of Superposition**- in horizontal sedimentary rock layers, the oldest layer is at the bottom; **Mold-** hollow area in sediment in the shape of an organism; **Paleontologist**s- scientists that study fossils; **Periods-** subdivision of eras; **Radioactive Decay-** when radioactive elements within rocks begin to break down or decay by releasing energy; **Relative Age-** age of a rock compared to other rocks; **Scientific Theory**- well tested concept that explains a wide range of observations; **Sedimentary Rock-** rock made of hardened sediment; **Trace Fossils-** provide evidence of the actions of once living things

Comments

Content: Plate Tectonics **Duration:** (3 weeks)

Essential Question:	How can the pattern of Earth's geologic processes support the Theory of Plate Tectonics? How do we describe and interpret Earth's features, their origins, and the processes that shape them?
Skill:	• Identify common features of the Earth given a map. • Describe the layers of the Earth. • Differentiate among the mechanisms by which heat is transferred. • Distinguish between physical and chemical weathering. • Describe the similarities and differences between the types of energy that drive the Earth's systems. • Locate various geologic structures using various mapping representations. • Explain how changes in Earth systems affect energy transformation and transport.
Instructional/Engagement Activities	
Assessment:	• Given a map, students will identify common features of the Earth. • Given a diagram/model of the Earth, students will label and explain the layers of the Earth. • Provided various lab materials, students will distinguish between the different types of heat transfer. • Given various lab materials, students will be able to identify the similarities and differences between convection in the mantle and convection in the atmosphere. • Provided a map, students will be able to locate various geologic structures. • Students will create models of Earth's common features. • Provided various lab materials, students will demonstrate how energy is transferred from one place to another.
Resources:	Prentice Hall Inside Earth (pages 4-36) Teacher generated activities
Standards:	3.3.6.A1. Recognize and interpret various mapping representations of Earth's common features. 3.3.7.A1. Define basic features of the rock cycle. Describe the layers of the Earth. Differentiate among the mechanisms by which heat is transferred through the Earth's systems.

	3.3.8.A1. Distinguish between physical and chemical weathering. Compare and contrast the types of energy that drive Earth's systems. 3.3.7.A6. MODELS/SCALES Locate significant geologic structures using various mapping representations. 3.3.6.A6. MODELS/SCALES Create models of Earth's common physical 3.3.8.A6. CHANGES Explain changes in Earth's systems in terms of energy transformation and transport. 3.3.7.A2. Explain land use in relation to soil type and topography.
Vocabulary:	**Asthenosphere**- lower, soft part of the mantle; **Conduction-** heat transfer between 2 materials that are touching; **Continental Drift Theory**- Wegener's hypothesis that Earth's continents are in motion; **Convection-** heat transfer by the movement of currents in a liquid; **Convection Current-** flow that transfers within a fluid; **Convergent Boundary**- where plates come together; **Crust**- Earth's outer skin; **Density-** mass/volume; **Divergent Boundary**- where plates move apart; **Inner Core-** dense ball of solid metal; **Lithosphere**- uppermost part of the mantle; **Mid-Ocean Ridges**- undersea mountain chains were new oceanic crust is formed; **Outer Core-** layer of molten metal that surrounds the inner core; **Pangaea-** Earth's supercontinent; **Plate Tectonic Theory**- states that pieces of Earth's lithosphere are in slow constant motion, driven by convection currents; **Pressure**- force / area; **Radiation-** transfer of energy through space; **Seismic Waves**- waves produced from earthquakes; **Transform Boundary**- where plates slide past each other; **Mantle-** the layer of hot solid material between the Earth's crust and core

Comments:

Content: Rocks and Minerals **Duration:** (2 weeks)

Essential Question:	How does the dynamic nature of the Earth's interior affect the lithosphere (i.e. rock cycle)? How do minerals relate to rocks? How do minerals and different rock types shape the world around us?
Skill:	• Define the basic features of the rock cycle. • Describe the layers of the earth.
Instructional/Engagement Activities	
Assessment:	• Given a diagram, students will identify the processes and features of the rock cycle. • Given a diagram/model of the Earth, students will label and explain the layers of the Earth.
Resources:	Prentice Hall Inside Earth (pages 112-166) Teacher generated activities
Standards:	3.3.7.A1. Define basic features of the rock cycle. Describe the layers of the Earth. Differentiate among the mechanisms by which heat is transferred through the Earth's system.
Vocabulary:	**Cleavage -** split along a flat surface; **Crystal systems-** atoms bond to create crystal systems; **Density-** mass/volume; **Fracture-** irregular breakage of a mineral; **Grains-** particles of minerals or other rocks; **Hardness-** determined by a scratch test; **Igneous rock-** rock formed from the cooling of magma or lava; **Luster-** how light is reflected from a mineral; **Metamorphic rock-**

existing rock is changed by heat, pressure or chemical reactions; **Mineral-** naturally occurring, inorganic solid that has a definite crystal structure and definite chemical composition; **Rock cycle**-a series of processes on Earth's surface and in the crust that slowly change rocks from one thing to another; **Sedimentary rock-** particles of other rocks or the remains of plants and animals are cemented together. **Streak-** the color of a mineral's powder; **Texture-** look and feel of a rock's surface; **Rock-** a solid mixture of minerals and other materials

Comments