

*Fourth Grade Elementary Science DRAFT Curriculum
2007 - 2008*

Unit 1: The Big Picture

Students are comparing and classifying minerals and rocks based on their physical properties and investigating the components of soil. They will determine how fossils provide information about plants, animals, and the environment of long ago. Students will also study the Earth's place in our solar system in order to identify the properties of the planet Earth that make it possible for the survival of life as we know it.

- a) Identify, compare, and classify the physical properties of different materials to define the characteristics of solids, liquids, and gases.
- b) Compare the properties of at least one other planet in our solar system to those of Earth to determine if it could support life as we know it.
- c) Identify the planets and their relationship to the Sun.
- d) Recognize that like all planets and stars, the Earth is spherical in shape.
- e) Provide evidence that supports the idea that our solar system is sun centered.
- f) **Identify the properties of the planet Earth that make it possible for the survival of life as we know it (i.e. temperature, location, presence of atmosphere, water as solid, liquid, gas).**
- g) **Based on data from investigations, classify samples of matter using observable properties (i.e., strength, hardness, flexibility).**
- h) Observe and classify a collection of minerals based on their physical properties (e.g. color, hardness, luster, streak).
- i) **Explain how rock is formed from combinations of different minerals.**
- j) **Explain that smaller rocks come from breakage of bedrock (solid rock underlying soil components and larger rocks).**
- k) **Explain that soil is made partly from weathered rock, partly from plant remains, and also contains many living organisms).**
- l) **Identify components of a variety of rocks.**
- m) **Compare the physical properties of rocks with those of minerals to note major differences.**
- n) Observe fossils to describe the physical structures of animals or plants imprinted on them.
- o) **Recognize and explain that the remains or imprints of plants or animals can become fossils.**
- p) Examine fossils to compare them to one another and to living organisms as evidence that some individuals survive and reproduce.
- q) **Identify what an animal or plant fossil is able to tell about the environment in which it lived (water, land).**

Unit 2: A Global View

Students will continue to study life on Earth. They will classify plants and animals according to their observable features, describe differences and similarities in populations, distinguish between learned and inherited traits, and investigate how the characteristics of plants and animals support their survival in an ecosystem. Students will describe the Sun as the main source of energy that powers the food chain and describe the relationship among producers, consumers, and decomposers.

- a) Observe and classify a variety of animals or plants in both familiar and unfamiliar environments, according to their observable features.**
- b) Describe what classifying tells us about the relatedness among the animals or plants placed in a group.**
- c) Describe differences in characteristics of organisms (e.g., keenness of vision in hawks) that demonstrate that organisms best suited for their environment have an advantage in surviving and reproducing.
- d) Recognize and describe that individual members of a population can differ from one another and populations may differ from habitat to habitat and these differences can affect their ability to survive and reproduce.**
- e) Explain that traits of animals and plants are either inherited, learned, or result from interactions with the environment.**
- f) Explain that the survival of individual organisms and entire populations can be affected by sudden (flood, tsunami) or slow (global warming, air pollution) changes in the environment.
- g) Identify the importance of the sun in the food chain, and describe the roles within food chains and webs: producers, consumers (e.g. scavengers, predators, prey), and decomposers.**
- h) Cite evidence that some organisms depend on dead plant and animal material for food and that almost all animals' food can be traced back to plants.**
- i) Explain that some source of energy (sunlight, food) is needed for all organisms to stay active and grow. (Classify the things that people and animals take into their bodies as food or not food. Plants use sunlight to make food.)**
- j) Describe that animals and plants use food to provide energy to grow, repair tissues, store for future use, or be eliminated as waste.**

Unit 3: Closer to Home

Students will research the needs of Maryland native plants and animals and identify

interrelationships between plants and animals in a habitat in their competition for space, food, and water. Students will use this information, as well as information about weathering, to conduct site investigations in order to design/maintain a schoolyard habitat.

- a) **Identify and describe interactions (i.e. nesting, pollination, seed dispersal) for plants and animals in their habitat, and explain the effects of their competition for space, food, and water.**
- b) **Observe, describe, and cite evidence to show that erosion (by wind, water, and ice) shapes and reshapes the Earth's surface as it moves Earth's materials from one location to another.**
- c) **Cite examples that demonstrate how weathering by natural agents such as wind, water, and ice produce slow changes on Earth's surface (e.g., deep canyons, sand dunes).**
- d) **Describe ways that the following processes contribute to changes always occurring on the Earth's surface**
 - **Erosion**
 - **Transport**
 - **Deposit**
- e) **Identify and describe the effects of events such as hurricanes and earthquakes which change surface features rapidly.**
- f) **Explain how Earth's:**
 - **Surface features (i.e., mountains, valleys, and oceans),**
 - **Environmental conditions (i.e., temperatures, amounts of food or nutrients, types of soil) and**
 - **Environmental changes (i.e., flood, tsunamis, air pollution, global warming)** limit the kinds of living things that can survive in an ecosystem.
- g) **Research the kind of environment needed by Maryland native plants and animals.**
- h) **Based on research, design a schoolyard habitat using native plants and explain how the plants may have positive consequences on the natural environment.**

Unit 4: Electricity and Magnetism

Students will recognize and describe the affects of static electric charges. They will investigate and provide evidence that electricity requires a closed loop in order to produce measurable effects and site evidence supporting that magnetic, electrical, and gravitational forces can act at a distance.

- a. Observe and describe how to produce static charges by friction between two surfaces.
- b. Observe the phenomena produced by static charges such as: light, sound, feeling a shock, attracting lightweight materials over a distance without making contact.
- c. Identify sources of electricity (e.g. electrical outlets, batteries, static electricity) and list common uses and effects of electricity in daily life.
- d. Describe with diagrams, construct, and compare arrangements of components of a *simple* circuit (e.g. one light bulb or one buzzer, one wire, one battery) that produce light and those that do not.**
- e. Describe and compare the path of electricity (circuit) within this system that caused the light to light or buzzer to buzz and those that do not affect them**
- f. Describe and compare materials that readily conduct electricity and those that do not conduct electricity.**
- g. Describe, construct, and compare arrangements of components of a *series* circuit (e.g. more than one light bulb, wires, batteries) that produce light and those that do not.
- h. Provide evidence to show that the flow of electrical energy through a simple and a series circuit requires a complete loop.**
- i. Construct a circuit that includes a switch that can produce a complete or incomplete loop.
- j. Describe the effect that two magnets have on each other (Like poles repel – Opposite poles attract).**
- k. Cite evidence supporting that forces can act on objects without touching them.**
- l. Describe the effect of a magnet on a variety of objects including those that are metallic or non-metallics, those made with iron or made with other metals, and on other magnets.**
- m. Compare a compass to a magnet based on observations of the effect a variety of objects (metallic or non-metallic; those made with iron or other metals; and magnets) have on a compass.
- n. Describe how to make a simple electromagnet with a battery, a nail, and a wire.
- o. Investigate and describe how electricity in a wire affects the needle of a compass.
- p. Cite examples showing that magnetic, electrical, and gravitational forces can act at a distance.