

## Soils Aren't Dirt Tour, Cedar Bog Description and Curriculum Resources

<b>Tour:</b>	Soils Aren't Dirt
<b>Availability:</b>	Wednesday, Thursday, and Friday September, October, April, May, June 9:30 a.m. – 2:30 p.m.
<b>Time Allowance:</b>	1½ hours on site
<b>Cost:</b>	\$3.00 admission fee per student
<b>Grades:</b>	Adaptable to all grades Maximum 100 students

### Description:

Learn about soils in central and west central Ohio. How did current soils get here? What are organic, wetland, and upland soils? Is Cedar Bog soil yucky or mucky or both? Who and what lives in the soil?

Although Cedar Bog is primarily thought of as a natural history site, the historic aspect of the region is tremendous. During this guided tour, students will see how a natural history site can also fit well into the social studies curriculum.

The bog is accessible by a mulch path and boardwalks; wheelchairs will need assistance. Please ask for parent volunteers to help with students on the trail. The students need to understand that field trips are an extension of classroom learning. Classroom rules still apply. Cedar Bog staff cannot conduct a tour and discipline the students as well.

Tours will occur regardless of the weather, except in the event of severe storms with high winds, thunder and lightning. Boardwalks may be slippery at any time of the year.

### Science Academic Content Standards Addressed:

#### Earth and Space Sciences (Earth Systems)

1<sup>st</sup>. Identify that resources are things that we get from the living (e.g., forests) and nonliving (e.g., minerals, water) environment and that resources are necessary to meet the needs and wants of a population.

3<sup>rd</sup>. Describe that smaller rocks come from the breakdown of larger rocks through the actions of plants and weather.

3<sup>rd</sup>. Observe and describe the composition of soil (e.g., small pieces of rock and decomposed pieces of plants and animals, and products of plants and animals).

3<sup>rd</sup>. Investigate the properties of soil (e.g., color, texture, capacity to retain water, ability to support plant growth).

3<sup>rd</sup>. Investigate that soils are often found in layers and can be different from place to place.

6<sup>th</sup>. Describe the rock cycle and explain that there are sedimentary, igneous and

metamorphic rocks that have distinct properties (e.g., color, texture) and are formed in different ways.

6<sup>th</sup>. Explain that rocks are made of one or more minerals.

7<sup>th</sup>. Explain the biochemical cycles which move materials between the lithosphere (land), hydrosphere (water) and atmosphere (air).

8<sup>th</sup>. Describe how landforms are created through a combination of destructive (e.g., weathering and erosion) and constructive processes (e.g., crustal deformation, volcanic eruptions and deposition of sediment).

#### **Earth and Space Science (Processes that Shape the Earth)**

4<sup>th</sup>. Describe how wind, water and ice shape and reshape Earth's land surface by eroding rock and soil in some areas and depositing them in other areas producing characteristic landforms (e.g., dunes, deltas and glacial moraines).

4<sup>th</sup>. Identify and describe how freezing, thawing and plant growth reshape the land surface by causing the weathering of rock.

4<sup>th</sup>. Describe evidence of changes on Earth's surface in terms of slow processes (e.g., erosion, weathering, mountain building and deposition) and rapid processes (e.g. volcanic eruptions, earthquakes and landslides).

#### **Life Sciences (Characteristics and Structure of Life)**

1<sup>st</sup>. Explore that organisms, including people, have basic needs which include air, water, food, living space and shelter.

1<sup>st</sup>. Explore that humans and other animals have body parts that help to seek, find and take in food when they are hungry (e.g., sharp teeth, flat teeth, good nose and sharp vision).

2<sup>nd</sup>. Explain that animals, including people, need air, water, food, living space and shelter; plants need air, water, nutrients (e.g., minerals), living space and light to survive.

2<sup>nd</sup>. Identify that there are many distinct environments that support different kinds of organisms.

2<sup>nd</sup>. Explain why organisms can survive only in environments that meet their needs (e.g., organisms that once lived on Earth have disappeared for different reasons such as natural forces or human-caused effects).

#### **Life Sciences (Diversity and Interdependence of Life)**

2<sup>nd</sup>. Compare the habitats of many different kinds of Ohio plants and animals and some of the ways animals depend on plants and each other.

3<sup>rd</sup>. Relate animal structures to their specific survival functions (e.g., obtaining food, escaping or hiding from enemies).

4<sup>th</sup>. Describe how organisms interact with one another in various ways (e.g., many plants depend on animals for carrying pollen or dispersing seeds).

5<sup>th</sup>. Describe the role of producers in the transfer of energy entering ecosystems as sunlight to chemical energy through photosynthesis.

5<sup>th</sup>. Explain how almost all kinds of animals' food can be traced back to plants.

5<sup>th</sup>. Trace the organization of simple food chains and food webs (e.g., producers, herbivores, carnivores, omnivores and decomposers).

5<sup>th</sup>. Summarize that organisms can survive only in ecosystems in which their needs can be met (e.g., food, water, shelter, air, carrying capacity and waste disposal). The world has different ecosystems and distinct ecosystems support the

lives of different types of organisms.

5<sup>th</sup>. Support how an organism's patterns of behavior are related to the nature of that organism's ecosystem, including the kinds and numbers of other organisms present, the availability of food and resources, and the changing physical characteristics of the ecosystem.

5<sup>th</sup>. Analyze how all organisms, including humans, cause changes in their ecosystems and how these changes can be beneficial, neutral or detrimental (e.g., beaver ponds, earthworm burrows, grasshoppers eating plants, people planting and cutting trees and people introducing a new species).

6<sup>th</sup>. Describe how organisms may interact with one another.

7<sup>th</sup>. Investigate how organisms or populations may interact with one another through symbiotic relationships and how some species have become so adapted to each other that neither could survive without the other (e.g., predator-prey, parasitism, mutualism and commensalism).

7<sup>th</sup>. Explain how the number of organisms an ecosystem can support depends on adequate biotic (living) resources (e.g., plants, animals) and abiotic (non-living) resources (e.g., light, water and soil).

7<sup>th</sup>. Summarize the ways that natural occurrences and human activity affect the transfer of energy in Earth's ecosystems (e.g., fire, hurricanes, roads and oil spills).

7<sup>th</sup>. Explain that photosynthetic cells convert solar energy into chemical energy that is used to carry on life functions or is transferred to consumers and used to carry on their life functions.

#### **Physical Sciences Nature of Energy)**

1<sup>st</sup>. Recognize that the sun is an energy source that warms the land, air and water.

6<sup>th</sup>. Explain that the energy found in nonrenewable resources such as fossil fuels (e.g., oil, coal and natural gas) originally came from the sun and may renew slowly over millions of years.

#### **Physical Sciences (Nature of Matter)**

6<sup>th</sup>. Describe that in a chemical change new substances are formed with different properties than the original substance (e.g., rusting, burning).

6<sup>th</sup>. Describe that in a physical change (e.g., state, shape and size) the chemical properties of a substance remain unchanged.

#### **Scientific Inquiry (Doing Scientific Inquiry)**

1<sup>st</sup>. Ask "what happens when" questions.

1<sup>st</sup>. Explore and pursue student-generated "what happens when" questions.

2<sup>nd</sup>. Ask "how can I/we" questions.

2<sup>nd</sup>. Ask "how do you know" questions (not "why" questions) in appropriate situations and attempt to give reasonable answers when others ask questions.

2<sup>nd</sup>. Explore and pursue student-generated "how" questions.

#### **Soils Glossary:**

**acid.** A substance that dissolves in water with the formation of hydrogen ions and reacts with a base to form a salt and water. It neutralizes alkalis, dissolves some metals, and turns litmus red; typically, a corrosive and sour-tasting liquid.

**bacteria.** Unicellular, prokaryotic microorganisms that lack chlorophyll, multiply by fission, and can be seen only with a microscope; they occur in three main forms: spherical, rod-shaped, and spiral. Some bacteria cause diseases such as pneumonia, tuberculosis, and anthrax, and others are necessary for fermentation and nitrogen fixation.

**base.** A substance that dissolves in water with the formation of hydroxyl ions and reacts with an acid to form a salt and water; turns litmus paper blue.

**biome.** Major ecological community (tropical rain forest, grassland, or desert).

**biotic.** Relating to life.

**characteristic.** A distinguishing trait, feature, quality, or property.

**conservation.** A careful preservation and protection of something; especially planned management of a natural resource to prevent exploitation, destruction, or neglect.

**crystal.** A piece of homogeneous solid substance having a natural, geometrically regular form with symmetrically arranged plane faces.

**decay rate.** The rate at which a radioactive isotope disintegrates until a final non-radioactive isotope is formed.

**decomposers.** Organisms such as bacteria and fungi that feed and breakdown dead organisms returning constituents of organic substances to the environment.

**environment.** The complex of physical, chemical, and biotic factors that act upon an organism or an ecological community and ultimately determine its form and survival.

**evidence.** Facts or observations on which a conclusion can be based.

**faulting.** To fracture so as to produce a geologic fault.

**fossil.** Remnant, impression or trace of an organism or past geologic ages that has been preserved in the Earth's crust.

**fossil fuel.** A fuel (such as coal, oil, or natural gas) that is formed in Earth from plant or animal remains.

**fungi.** Any of a major group or saprophytic or parasitic spore-producing organisms including molds, rusts, mildews, smuts, mushrooms, and yeasts.

**glaciation.** To subject to glacial action in which a large body of ice moves slowly down a slope or valley, or spreads outward on a land surface.

**habitat.** The place or environment where a plant or animal naturally or normally lives and grows.

**life cycle.** The series of stages in form and functional activity through which an organism passes from fertilized ovum to the fertilized ovum or the next generation.

**mass.** The property of a body that is a measure of its inertia and that is commonly taken as a measure of the amount of material it contains causing it to have weight in a gravitational field.

**microorganisms.** An organism of microscopic or ultramicroscopic size.

**mineral.** A solid homogeneous crystalline chemical element or compound that results from the inorganic processes of nature.

**natural.** Existing in, or produced by nature.

**neutral.** Neither acidic or basic (as in pH).

**nutrient.** A nutritive substance or ingredient.

**observe.** To watch carefully, especially with attention to details or behavior for the purpose of arriving at a judgment.

**organic.** Compounds containing carbon and chiefly or ultimately of biological origin.

**organism.** An individual constituted to carry on the activities of life by means of organs separate in function but mutually dependent; a living being.

**pH scale.** A numerical measure of the acidity or alkalinity of a chemical solution.

**property.** A quality or trait belonging to an individual or thing.

**sediment.** Material deposited by water, wind, or glaciers.

**species.** A group of organisms consisting of similar individuals capable of exchanging genes or interbreeding.

Cedar Bog is operated by the Ohio Historical Society, a nonprofit organization that serves as the state's partner in preserving and interpreting Ohio's history, archaeology, and natural history.