

Soil Eco-Service 'Understanding by Design' Curricula Plan

Title: Walking on Ecosystems!

Overview: In this module, children explore the world under their feet. They examine the physical and biological properties of soil by uncovering a soil profile, testing pH and organic matter content of soil, looking for soil organisms, and learning about the world of a worm. Learners can share their knowledge with family members and classmates by repeating activities at home and working on a take-home pamphlet, or preparing Science Night projects. An optional stewardship/ service-learning project involves learners building a worm compost bin and using the compost to improve the soil quality for some of their favorite plants.

Grades: 3rd/5th

Stage 1 – Desired Results

Established Goals:

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Related Science Content

GPS Second Grade Earth Science

S2E3. Learners will observe and record changes in their surroundings and infer the causes of the changes.

a. Recognize effects that occur in a specific area caused by weather, plants, animals, and/or people.

Life Science

S2L1. Learners will investigate the life cycles of different living organisms.

d. Identify fungi (mushroom) as a living organism.

Third Grade Earth Science

S3E1. Learners will investigate the physical attributes of rocks and soils.

c. Use observation to compare the similarities and differences of texture, particle size, and color in top soils (such as clay, loam or potting soil, and sand).

d. Determine how water and wind can change rocks and soil over time using observation and research.

Fourth Grade Living Environment

S4L1: Describe the roles of organisms within the populations of an ecosystem.

a. Identify the roles of producers, consumer, and decomposers in a community.

b. Demonstrate the flow of energy through a food web/chain beginning with sunlight and including producers, consumers, and decomposers.

c. Predict how changes in the environment would affect

Habits of the Mind:

2nd grade science skills

- Asks questions and answers by observation
- Assembles and takes apart
- Describes changes in materials
- Communicates ideas
- Questions and attempts answers
- Gives accurate descriptions

3rd grade skills

- Records investigations
- Makes sketches
- Compares and describes numerically
- Researches
- Uses tools
- Answers their own questions
- Communicates findings

4th grade skills

- Ask questions that lead to investigations
- Conduct simple investigations
- Uses tools for collecting data
- Uses data to answer questions
- Writes and uses instructions
- Justifies reasonable answers
- Identifies patterns of change
- Researches for information

<p>a community (ecosystem) of organisms.</p> <p>Fifth Grade Earth Science</p> <p>S5E1. Learners will identify surface features of the Earth caused by constructive and destructive processes.</p> <p>b. Identify and find examples of surface features caused by destructive processes.</p> <ul style="list-style-type: none"> • Erosion (water—rivers and oceans, wind) <p>S5L4. Learners will relate how microorganisms benefit or harm larger organisms.</p> <p>a. Identify beneficial microorganisms and explain why they are beneficial.</p>	<p>5th grade skills</p> <ul style="list-style-type: none"> • Records observations • Offers and considers reasoning • Quantifies data • Uses scientific tools • Describes changes • Compares physical attributes • Draws and sketches • Questions and seeks to find answers • Researches for scientific information • Replicates investigations • Asks quality questions
<p>Enduring Understandings: U</p> <p><i>Learners will understand that...</i></p> <p>Soil is important to all living creatures.</p>	<p>Essential Questions: Q</p> <ul style="list-style-type: none"> • Why is soil important? • How is soil formed? • Who are the major decomposers on the school site? • What are threats to soil? • How do humans impact soil quality? • What can help to stop soil erosion?
<p><i>Learners will know...</i> K</p> <ul style="list-style-type: none"> • The organisms that are important for forming soil. • The physical factors that are needed to form soil. • The four horizons of soil and the role of each in plant growth. • The role of microorganisms in soil formation. • Names of five invertebrates that live in soil. • The importance of the process of soil production in supporting life on earth. 	<p><i>Learners will be able to...</i> S</p> <ol style="list-style-type: none"> 1. Identify horizons in a soil profile. 2. Name the components of soil. 3. Discuss how soil is formed. 4. Measure physical properties of soil such as pH, water infiltration rate, and organic matter content. 5. Locate areas where soil is healthy and will promote plant growth. 6. Describe the factors that are important to soil organisms. 7. Describe the physical features and behavior of worms.
<p>Stage 2 – Assessment Evidence</p>	
<p>Performance Task: T</p> <ol style="list-style-type: none"> 1. Keep results of soil studies in a club journal. 2. AT HOME: Visit designated websites and answer questions about soils. 3. Active participation in all hands-on inquiry activities. 	
<p>Key Criteria</p> <p>Complete investigation worksheets and journal entries accurately and creatively.</p>	
<p>Other Evidence OE</p> <ol style="list-style-type: none"> 1. Develop and perform a puppet show that explains the importance of school site soil organisms. 2. Develop a school compost pile, worm recycling bin or plant in an eroded area of the school site to 	

rebuild the soil.

3. Take a field trip to a botanical garden, natural history museum or a natural area to further address established goals.

Stage 3 – LEARNING PLANS: See Wheels