

Frog Prints

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Teacher's Guide

Grade Level: PS-5
Subject Areas: Science – Life Science (LS)
Science – Earth and Space Science (ESS)
Science – Engineering (ET)

Objectives and Goals

- Science objectives
 - Students will learn about the forest/wetlands environment
 - Students will learn about groundwater
 - Students will learn about effects of groundwater pollution
- Life Skill objectives
 - Students will learn to analyze problems and apply solutions
 - Students will learn that actions have consequences

Required Materials and Equipment

- Teacher reference sheets
 - Article on Ground Water
 - Water Cycle Diagram from the United States Geological Service
 - Water Distribution from the United States Geological Service
 - Watersheds of the Kansas City Region
 - Watersheds and Drainage Basins from US Geological Survey
 - Article on Deformed Frog Research initiated by kids in Minnesota
 - Crossword Puzzle with answers
- Information Sheets from Lakeside Nature Center
 - Habitat – Oak-Hickory Forest
 - Habitat – Marsh (Wetlands)
 - Cool Facts – Frogs and Toads
- Student Sheets
 - More than Just a Swamp from US Fish and Wildlife Agency
 - Storm Sewers are not trash cans
 - Why Groundwater is important
 - Frog Puppet Instructions
 - Pond Life Coloring Sheet
 - Crossword Puzzle
 - Word Search

Anticipatory Set

- Discuss the importance of Ground Water
- Discuss watersheds and drainage basins
- Discuss the effect of water and stream pollution
 - Runoff from agriculture, industry and urban impermeable surfaces
 - Direct pollution from humans (examples include putting trash into the storm runoff system, depositing animal feces into the drainage system)
- Ask students what could be done to help. Possibilities include
 - Smaller, more concentrated development
 - Changes in farming styles (less slash and burn)
 - Proper disposal of waste products
 - Encouraging rain gardens
- Ask students what they can do. Even little things help! Possibilities include
 - Making sure that nothing 'nasty' goes down storm drains so pollution is lessened
 - Using less water
 - Showers vs baths
 - Turning the faucet off while brushing teeth
- Explore how to work in a group to achieve a goal

Direct Instruction

- What is Ground Water and how does it impact our lives?
- What is the Water Cycle?
- What is a Watershed?
 - Do we live in one?
 - Which one?
- What is a habitat or biome?
 - Oak-hickory forest
 - Wetlands/Marsh
- What is a pinnacle/apex species?
- Frogs and Toads

Guided Practice

- Create a frog puppet (see instruction from StoneLion Puppet Theatre)
- After reading *More than Just a Swamp*, set up groups to
 - Solve the crossword puzzle
 - Work on the word search

Watch performance of ***Frog Prints***

Next Generation Science Standards Fulfilled

Grade K – Performance Expectations

- K-LS1-1: Use observations to describe patterns of what plants and animals (including humans) need to survive.
- K-ESS3-3: Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.
- K-2-ETS1-1: Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

Grade 1 – Performance Expectations

- K-2-ETS1-1: Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

Grade 2 – Performance Expectations

- K-2-ETS1-1: Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.
- 2-LS4-1: Make observations of plants and animals to compare the diversity of life in different habitats.

Grade 3 – Performance Expectations

- 3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- 3-2-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
- 3-LS3-2. Use evidence to support the explanation that traits can be influenced by the environment.
- 3-LS4-3. Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.
- 3-LS4-4. Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.

Grade 4 – Performance Expectations.

3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

3-2-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

Grade 5 – Performance Expectations

3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

3-2-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

5-ESS3-1. Obtain and combine information about ways individual communities use science ideas to protect the earth's resources and environment.