River Bend NATURE CENTER

The Water Cycle

School Program (4th grade)

Lesson Plan

Theme: Water can be stored in many different places, and many of these examples can be found at River Bend. The water cycle is an essential part of life on Earth, which is why we should be careful about how we use water resources.

Length of Lesson:
Introduction: 15 minutes
Field and Interpretive Center (IC) Activities: 95 minutes
Conclusion: 10 minutes

Minnesota Academic Science Standards/Benchmarks:

- 4.3.2.3.1-Identify where water collects on Earth, including atmosphere, ground and surface water, and describe how water moves through the Earth system using the processes of evaporation, condensation, and precipitation.
- 4.3.4.1.1-Describe how the methods people utilize to obtain and use water in their homes and communities can affect water supply and quality.

Excellence in EE: Guidelines for Learning Standards:

- Grades (K-4) - Strand 1 Questioning, Analysis, and Interpretation Skills F) Working with Models and Simulations
- Grades (K-4) - Strand 2.1 The Earth as a Physical System B) Changes in Matter
- Grades (K-4) Strand 2.4 Environment and Society A) Human/Environment Interactions

Objectives (Students will be able to…):

- Define the steps of the water cycle (evaporation, condensation, precipitation, transpiration).
- Identify examples of evaporation, condensation, transpiration, surface, and groundwater at River Bend.
- Explain how humans affect both surface and groundwater through water use and pollution.

Background Information :

The water cycle occurs everywhere on Earth and enables life to exist. **Evaporation** is where water is heated up from the sun and becomes a gas, rising into the atmosphere. There it cools (**condensation**) to form clouds. When the clouds get too heavy with water, **precipitation** occurs as rain, sleet, hail, or snow. Plants and animals take in water and are some of the main transporters of water in a system. Trees and other leafy plants release water vapor through their leaves during the process of photosynthesis. This release of water is called **transpiration**. For water cycle activities and more information about human effects on the water cycle, see Appendix A and B .

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Introduction:

Goals: Welcome students to River Bend, introduce the River Bend leaders, and introduce the pro gram content.

Key points:

- Welcome
- Demonstrate how much water is found in the world
- Review/introduce water cycle stages
- Set expectations for the day

Activities:

1. Aquifer model (interactive lesson)

Goal: To understand what an aquifer is and how it relates to real life examples.

Key points:

- Students will work in small groups to build an aquifer model.
- Each group will use the model to see the connectivity in the system.

Assessment: Students should be able to provide answers to what an aquifer is, how it works, how it's connected to all other components of the water cycle.

2. Field Hike

Goal: To find real life examples of ground water, surface water, and water stored in living things.

Key points:

- Focus on visible water sources.
- Discuss how pollution could impact these water sources.

Assessment: Students should be able to answer water cycles questions using appropriate terminology. To determine depth of understanding have students explain what would happen if a pollutant was introduced into one water source.

3. Water Cycle Games:

Goal: Participants will solidify knowledge and understanding of the water cycles through playing an engaging game.

Key Points:

- Students will become water molecules as they try to make it down the river without being utilized by plants.

Assessment: Students should be able to explain why the river never dried up in the game as well as use the term transpiration correctly.