Grade: 6th

Program Title: Water Sampling

Related Iowa Core Performance Expectations:

MS-ESS3-1. Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes. [Clarification Statement: Emphasis is on how these resources are limited and typically non-renewable, and how their distributions are significantly changing as a result of removal by humans. Examples of uneven distributions of resources as a result of past processes include but are not limited to petroleum (locations of the burial of organic marine sediments and subsequent geologic traps), metal ores (locations of past volcanic and hydrothermal activity associated with subduction zones), and soil (locations of active weathering and/or deposition of rock).]

MS-ESS2-4. Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity. [Clarification Statement: Emphasis is on the ways water changes its state as it moves through the multiple pathways of the hydrologic cycle. Examples of models can be conceptual or physical.] [Assessment Boundary: A quantitative understanding of the latent heats of vaporization and fusion is not assessed.]

Future Considerations: Blend this program with the unit storyline developed by the classroom teacher.

Program alignment with the Iowa Core Science Standards:

Disciplinary Core Ideas (DCIs)	**Investigative Question**	**Investigative Phenomena**	**Practices (SEPs) Students will:**	**Cross Cutting Concepts (CCCs) Students will identify:**
ESS3.A: Natural Resources Humans depend on Earth's land, ocean, atmosphere, and biosphere for many different resources. **ESS2.C: The Roles of Water in Earth's Surface Processes** Water's movements—both on the land and underground—cause weathering and erosion	What sort of water pollution problems are taking place in my neighborhood, and the state of Iowa?	Two or three different labeled containers of water: 1. tap water 2. tile water 3. pond water Are all three of these safe to drink?	**Ask questions about the look of water and the impression the visual appearance makes on them.** **Use a model when they interact with the Enviroscape. They will observe and test ideas and explanations.** **Plan and carry out investigations when water sampling using the IOWATER program.** **Analyze and interpret data obtained from model observations and data collections.**	**Cause and Effect when considering w**hat happens to our water when we add things to the land. **Scale, Proportion, and Quantity when considering if** things we do on the land impact anyone or anything else? **Systems and System Models when** using a tabletop Enviroscape model to help understand the water cycle as a system.

Program components: The presenter will have students use the CCCs, the SEPs and the phenomena to figure out how to answer the investigative question and to grasp the disciplinary core ideas.

Divide class in half.

1. One half starts with the Enviroscape model with naturalist interaction. Point and non-point source pollution are main objectives of understanding.
2. Other half begins constructing their own Enviroscape model with foil pans, different soil types, buffer, and water. Teacher interacts with this group.
3. Water testing with IOWATER program materials Naturalist and teacher lead testing for N, P, pH, DO.
4. Return to investigative question to assess what the students have learned - What sort of water pollution problems are taking place in my neighborhood, and the state of Iowa?