



ART OF CONSERVATION[®]

FishOn! Curriculum

Rivers - Shaping the Land

Overview:

Students will create river models in stream tables to understand the dynamic processes of rivers, including erosion, deposition, and the impact of various factors such as waterflow and human activity on river behavior.

Students Will Be Able To:

- Define and differentiate between erosion and deposition
- Demonstrate understanding of river dynamics through hands-on exploration
- Describe how human activities can impact riverways

Next Generation Science Standards

Practices

- Developing and Using Models

Core Ideas

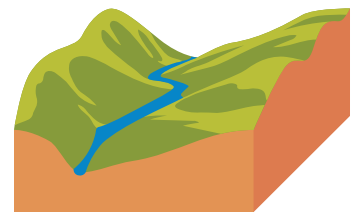
- ESS2: Earth's Systems
- ESS3: Earth and Human Activity

Crosscutting Concepts

- Stability and Change
- Scale, Proportion, and Quantity

To Prepare:

- Large trays or plastic containers with high edges
- Soil, sand, or other sediment
- Jars of water
- Optional: natural objects such as rocks, leaves, sticks, and grass to act as vegetation and obstacles.



Place a thick layer of soil or sand on the bottom of the tray. Prop one end slightly higher than the other to mimic the downstream flow of rivers.

Procedure:

Step 1: Think-Pair-Share: What impacts do rivers have on humans, animals, and the environment?

Impacts on humans: provide sources of drinking water, useful for hydroelectric energy, used for transportation, a place to recreate

Impacts on animals: provides habitats for many species, sources of food and water

Impacts on the environment: shapes the landscape through erosion and deposition, cycles nutrients through the ecosystem



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Review the following terminology with students:

Erosion: Natural forces slowly wearing away small bits of earth. Wind, ice, and flowing water can cause erosion.

Deposition: Natural forces depositing small bits of earth back onto the land away from where it originally came from.

Step 2: Case Study - The Grand Canyon

Canyons are an excellent example of erosion. Show pictures of the Grand Canyon to students and ask them to hypothesize how it came to be. Share that the Colorado River slowly eroded the earth over 6 million years. The river continues to flow and very slowly erode the canyon. Emphasize that natural erosion happens over a LONG period of time, encompassing millions of years.

Human activities like agriculture and development removes plant life and shifts topsoil, greatly increasing the rate of erosion in some places. This can impact the surrounding ecosystem by increasing pollution in waterways, decreasing soil quality, and worsening flooding.



Step 3: Break students into groups and assign each group a stream table to explore. Have students form a channel in their sediment to create a river bed, then follow the prompts on the **Rivers** worksheet and make observations about what happens. Students may require help with resetting their stream tables between modeling different variables.



Student Worksheet

Rivers - Shaping the Land

Name: _____

How does waterflow impact a river bed? Start with slowly pouring just half a jar of water into your river from the top of the channel. Observe how the water flows through the landscape. Slowly increase the amount of water to 1 jar, then 1 1/2 jars. In the boxes below, make notes on how your river responded to increased water flow. Where is erosion and deposition taking place?

1/2 Jar

1 Jar

1 1/2 Jar

What happens when small plants or grasses are introduced along the riverbank? Does this effect erosion and deposition patterns?

Add obstacles to your river like sticks or rocks. Does this change the shape of your river channel? How so?

If you were to conduct this experiment again, what additional modifications would you consider exploring?

How could human actions contribute to erosion or affect the overall health of a river system?
