



STREAM TABLE INSTRUCTIONS

(Recommended for grades 4 and up)

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OBJECTIVE

- ▶ To understand stream flow processes, such as erosion, deposition, and formation of deltas.
- ▶ To understand why streams meander.
- ▶ To understand the impact of bank erosion and the value of riparian vegetation.
- ▶ To understand what a flood plain is and how it helps protect against flooding.
- ▶ To understand the definition of a “model” and its limitations for simulating real-world conditions.

RECOMMENDED AUDIENCE AND SETTING

This activity is suited for students in grades 4 and up. It can be performed indoors or outdoors at water days, fairs, or other events where participants are free to roam from table to table. This activity requires electricity and 3 to 4 gallons of water.

ACTIVITY

Time Required: 15 to 20 minutes, depending on the depth of instruction.

MATERIALS NEEDED

- ▶ Stream table with re-circulating pump.
- ▶ Laminated 11 × 17 inch erosion, deposition, and delta graphic.
- ▶ Key terms and definition handout.
- ▶ Props (e.g., fences, animals, tractors, cars, rocks, fabric, buildings, and more) to place in stream table.
- ▶ Download instructions at http://texas4h.wpengine.com/wp-content/uploads/water_Diy-Recirculating-Stream-Table.pdf

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Figure 1. Stream table.

PREPARATION

Step 1 Prepare the stream table (Fig. 1) for operation. Make sure it is secured on a flat table and propped up on one end to allow water to flow toward the drain. Level out the sand, leaving the bottom end near the drain so it is free to pool water. Test and adjust the water flow into the top end of the stream table. Then, place rocks or other materials to keep the sand from washing away as water flows into the stream table.

Step 2 Use a ruler or flat object to create the initial stream channel.

GETTING STARTED

Begin by saying, “the stream trailer is a **model** used to simulate what happens when water flows in a stream or river.” **Ask, “what is a model?”** Explain that a model is a small-scale representation of something real. Ask students to observe the stream table closely and explain what the different parts represent. The plastic container represents the **watershed** that collects rainwater and drains the water to an outlet point. Ask a student to read aloud the definition of a watershed from the handout. The water pump/water represents rainfall or streamflow. The sand represents the soil in the watershed, the drain outlet represents water leaving the watershed, and props positioned in the stream table represent different real-life objects. Ask students for examples of why

this model does not exactly depict real life conditions. Suggestions may be lack of vegetation, lack of soil type variation, rainfall normally flows into a stream from many directions, the size and shape of props are out of proportion, and more.

Explain that while the model is not exactly a real-life representation, it allows the student to witness similar processes that occur. Hold up the laminated graphic and show examples of **erosion**, **deposition**, and **deltas**. Read aloud the definition of **erosion**, **deposition**, and **delta**.

Have students draw out the initial shape of the river. Then, turn on the pump and ask students to observe and point out erosion, deposition, and formation of deltas. State that water flows fastest near the outside of a curve, and slowest on the inside of a curve. Let the water run slowly, then adjust the water flow to speed up or down and have students observe what happens. After a few minutes, turn off the pump and ask students to draw the final shape of the river. Discuss how and why the shape has **meandered**. In the time remaining, discuss one or more Talking Points below to reinforce concepts and environmental implications.

KEY TERMS AND DEFINITIONS

1. **Watershed** – an area or ridge of land that separates waters flowing to different rivers, basins, or seas.
2. **Water cycle** – the cycle of processes by which water circulates between the earth’s oceans, atmosphere, and land, involving precipitation as rain and snow, drainage in streams and rivers, and return to the atmosphere by evaporation and transpiration.
3. **Meander** – a winding curve or bend of a river, which is the natural shape of rivers and streams.
4. **Weathering** – in geology, it is the various mechanical and chemical processes that cause exposed rock to decompose.
5. **Erosion** – the process of eroding or being eroded by wind, water, or other natural agents.
6. **Deposition** – a geological process in which sediments, soil, and rocks are added to a landform or land mass.
7. **Delta** – a landform that forms at the mouth of a river, where the river flows into an ocean, sea, estuary, lake, or reservoir. Deltas form from deposition of sediment carried by a river as the flow leaves its mouth.
8. **Groundwater** – water held underground in the soil or in pores and crevices in rock.
9. **Runoff** – the draining away of water or substances carried in it, from a land surface area, a building or structure, and more.

10. **Topsoil** – The thin, rich layer of soil where most nutrients for plants are found.
11. **Conservation** – preservation, protection, or restoration of the natural environment, natural ecosystems, vegetation, and wildlife.
12. **Aquifer** – a body of permeable rock that can contain or transmit groundwater.
13. **Water well** – an excavation or structure created in the ground by digging, driving, boring, or drilling to access groundwater in underground aquifers. Water is lifted by a pump, or using containers, such as buckets, which are raised mechanically or by hand.

TALKING POINTS

1. A model is a small-scale representation of a real-life process.
2. What real-life “things” are missing in this model (e.g., vegetation, different soil textures, farms, cities, roads, and more)?
3. Erosion is caused by wind, water, or ice.
4. The faster the water, the more potential damage it can cause.
5. Fast-moving water can transport particles of soil from one place to another.
6. When water slows, it deposits the soil particles.
7. Formations like sand bars or deltas can form because of deposition.
8. Sediment picked up in rivers is deposited in lakes and reservoirs, reducing the lake’s water storage capacity.
9. Dredging is the practice of removing sediment in a lake, river, or channel to increase water storage capacity.
10. Water tends to travel in a straight line until it hits an obstruction (e.g., bank, fallen tree, boulder), then it changes direction.
11. Rivers and streams can transport significant amounts of trash.
12. The speed of water in a river or stream can be slowed by its shape (meandering vs. channelized)
13. Vegetation on the land and along river or streambanks can reduce erosion.
14. Slower runoff allows water to percolate into the ground (i.e., helps fill aquifers).
15. In an effort to promote conservation, society needs to control and limit pollutants that end up in waterways—directly and indirectly. Pollutants can be in the form of soil, oil, pesticides, trash, and much more.