

## Grand Canyon Model Instructions, Part 2 (Teacher Master)

In the previous lesson, students used a canyon stream-table model to demonstrate how water in spray bottles—representing snowmelt and rain in the mountains—forms streams and side canyons. In this investigation, students will use drip systems to make a “river” flow through the canyon model. This model is intended to demonstrate how water carries sediment (sand and soil) out of the canyon through the river channel.

### Materials

- Plastic bin approximately 18" x 6" x 29" (to catch water)
- Stream-table model (premade)
- Sand or a mixture of sand and soil (not potting soil)
- 1 or 2 drip systems (to simulate a river)

**Note:** You can use any gallon-sized container for the drip system. One recommendation is Reliance Fold-A-Carrier collapsible 2.5-gallon water container. You can also use an empty plastic bottle like the one on page 3.

### How to Make Extra Drip Systems

Heat up the end of a screwdriver with a flame. When it is sufficiently hot, poke a hole near the base of an empty plastic bottle. Make sure the hole matches the diameter of the plastic piping. Connect the plastic piping to the bottle, using silicone caulk to seal the area where the piping enters the water bottle to ensure that it doesn't leak. (Plastic drip piping and shut-off valves can be purchased at a local hardware store, usually in the irrigation section.)

1. Place the canyon stream-table model in a plastic bin. Adjust the angle so the upriver end of the model is at least a couple of inches higher than the downriver end.
2. Add sand and soil “mountains” across the upriver part of the model and on both sides of the upriver edges. This will ensure that the model more accurately reflects what actually happens to form the canyon: The snowmelt from the Rocky Mountains

in Colorado flows across the Colorado Plateau in small streams that gradually combine to form the Colorado River as it cuts through the Colorado Plateau and carves out the Grand Canyon.



Photo courtesy of BSCS

3. Fill the drip system with water. Make sure the shut-off valve is closed. If you use more than one drip systems along the top or sides of the model, make sure students understand that these systems represent streams from the side canyons that are combining to join the main “river” as it flows through the Grand Canyon.



Photo courtesy of BSCS



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4. Using a large cup or stack of books, place the drip system at the upriver end of the model, slightly higher than the model itself. Loosen the cap of the drip system a little to allow air to escape while running the demo. (**Note:** Before running the demo, test the angle of the canyon and drip system to make sure they're lined up correctly.)



Photo courtesy of BSCS



5. Fill in the canyon area with diatomaceous earth or a mixture of brown sugar, sand, and soil. Make the area somewhat level.



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6. To run the river demonstration, slowly open the shut-off valve to turn on the water. A canyon will be carved out as the sediment runs off the model. Usually one bottle of water is enough, but if the angle of the model isn't high enough, or if the sediment is too heavy (such as too much sand or chunky soil), several bottles of water may be needed to carve out the canyon.

7. The canyon should appear by the end of the demonstration. Ask students how this relates to what they learned in lesson 4a.

8. Cleanup is a bit messy, but using the plastic bin will help. You can dump the water and sediment outside and rinse the model in the sink. Allow it to dry completely before storing it.



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