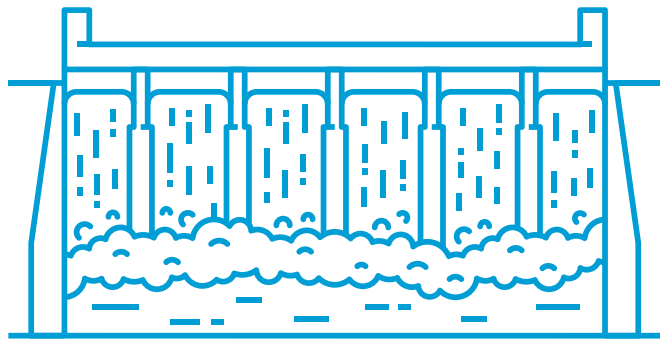


## ACTIVITY 4: MODELING DAM CONSTRUCTION AND REMOVAL



In this engineering challenge, students will discover the impact of dams on river ecosystems and model the process of dam building and removal.

### **Materials:**

- Aluminum half-sheet baking trays
- Modeling clay
- Small toy animal figures
- Small pebbles or rocks
- Small plastic or wooden blocks to represent dams
- 1-qt measuring cups or large beakers
- Watering cans or spray bottles

First, inform students that they will be creating a model of a river dam ecosystem and simulating the process of dam removal. Have them partner up and obtain all the necessary materials for the experiment.

Next, have students create a riverbed using modeling clay along the bottom of the baking sheet and place toy animal figures in the river to represent aquatic life. Ensure that their river beds have high enough banks so that water could be filled up in the river without overflowing out onto the banks, and add some curves/bends to their rivers.

Then, before students add a dam to one point of the river—using the plastic or wooden blocks—to block the flow of water down the river, have them test the flow of water by pouring water slowly at one end of their river and observe how it flows.

If their riverbed needs any adjustments in order to hold water and allow it to flow, have them make adjustments to their system and retest the water flow until they are satisfied.

Last, have students add a dam to one point of the river—using the plastic or wooden blocks—to block the flow of water down the river. Now, they are ready to test the flow of water with the dam in place by pouring water slowly at one end of their river and observing how the dam affects the flow. They should record their observations of how the water flow compared with and without the dam. They can slowly/gradually remove the blocks that make up the dam to simulate dam removal and observe what happens. Have them repeat the dam simulation by installing it and removing at different points along the river, and observe what happens to river flow and the ecosystem. Additionally, when a dam is in place in any location along their rivers, have students do at least one rainfall stress test, e.g., have them pour/spray water on the river to simulate rainfall and observe what happens to the river ecosystem when additional water enters the system.

After students have finished their experiments, facilitate a discussion with them about the consequences of dam placement on the river ecosystem. Help them see the connection between the location of the dam and how it impacts the river. Be sure to discuss the observations from the rainfall stress test and what happened during the removal of their dams at various locations along their rivers. Extend the discussion to talk about the ecological implications of dams and dam removal.