



# Up on the Watershed

This activity center is part of the **Water Science** theme.

## Purpose of this activity:

The water which flows on the earth's surface represents our only opportunity to influence the water cycle toward the meeting of our water quantity needs. Therefore, the management of water quantity demands knowledge of the interactions of land and water. Land in all its variations decides the direction of flow, the rate of flow and the shape of lakes and rivers. An understanding of all of the above begins with knowledge of watersheds. The purpose of the Up on the Watershed activity is to show what happens within a watershed during high water, such as in spring when the snow melts ... spring flooding.

## Key Messages:

- Understanding of what a watershed is
- Understanding that a watershed is a system of rivers and lakes draining into one main river
- Surface water, found in rivers, lakes and streams, is the only part of the hydrologic cycle that humans can attempt to control

## Materials

- Watershed simulator
- funnels
- Stoppers to act as dams
- plastic watershed divide
- 3 catcher pails
- 4 cups of water
- paper towels or sponges

## What will I be doing?

**Set Up:** The activity station will be set up for the volunteer

**Watersheds:** Present the simulator to the group explaining what each funnel represents.

-The top funnel represents 'nature', the other funnels

represent lakes within the watershed.

-Plug the first funnel with your finger and fill it up with water.

- When the funnel is full release your finger, and explain to the students that this is similar to a spring melt.

- The plastic ring with houses on it goes on the bottom funnel and this represents a town on a floodplain.

**Q: Ask the students 'How do you (as water managers) control flooding?**

**A:** By using dams, which are represented by the rubber stoppers with various sized holes.

-The children try to stop the flooding at all lakes and the town by placing the stoppers within the funnels. Note that the stoppers have different sized holes and therefore the sequence of sizes is important.

-Only one sequence will stop flooding of all the lakes.

With a catcher pail, pour water into one of the top funnels and observe that all the water eventually drains into a bottom catcher pail.

-Next you give them sponges which represent wetlands ... nature's flood control.

-Wetlands are associated with lakes and they act like sponges, soaking up excess water and slowly releasing it through the summer.

-The children then experiment with using sponges to see how many dams they can do without (if not all) by just using nature's flood control systems ... wetlands.

**Q:** Why are wetlands so important?

**A:** They help regulate water flow, absorb water, provide habitat for animals, fish, amphibians, insects and plants.

**Q:** What do you think would happen if we keep destroying wetlands?

**Watershed Divides:** Pour water onto the peak of the plastic divider. A portion of the water will flow down both sides of the divider. The peak of the divider represents a watershed divide where water decides in which direction it will flow. Either side of the divide may be said to represent different watersheds. In real life, the watershed divide represents high points of land relative to the surrounding land.

## Questions to Ask the Students

**Q:** Which combination of stoppers worked the best to slow down the water? Why?

**Q:** Can anyone tell me what a watershed is?

**A:** Its an area of land that drains water into rivers, streams, wetlands, ponds and eventually drains to one point. It consists of floodplains, forests, agriculture fields and even towns where people live.

**Q:** What are changes to wetlands that humans cause?

**A:** These change include the building of dams, draining wetlands for agriculture use which usually involves engineering channels, deforestation around wetlands, urbanization, industrialization, recreational activities, mining and introduction of exotic species



## Background Information:

**Water Cycle:** The watershed and the flow of surface water are components of a larger system called the water cycle. Water in the gaseous state in the atmosphere undergoes condensation, forms water droplets and falls as rain. A catcher pail pouring water on the simulator could represent a cloud raining down on the watershed. The bottom catcher pail serving as the bottom of the watershed collects the water as would a lake, pond, sea ocean or river. Bringing the catcher pail up to the top of the simulator may represent evaporation thus completing the cycle. By cycling all the water through the simulator, top to bottom and to the top again, the closed nature of the water cycle is demonstrated. In other words, the Earth only has so much water that is continually moving around the water cycle.

Many towns have been built historically on floodplains. When the water is released during spring melt (or any other high water times) ... the water rushes through all the funnels (lakes), filling them up and then some and spills over onto the town ... representing flooding. Although the simulator does not portray groundwater very well, it cannot be ignored as an integral part of the water cycle. It is groundwater and the water table that maintain bodies of water on the surface. Only where the water table comes up above the land surface is water allowed to exist without soaking into the ground.

## Clean Up Procedures:

Dump all catcher pails of water in various spots of the activity area to ensure that water does not create lots of mud for the next day. Help John clean up the model and pack away for the next day.