

DROPS OF KNOWLEDGE FOR RIVERS OF CHANGE



GLOBAL TEACHING
AND LEARNING MATERIAL

A hands-on guide to teaching
and learning about
water, sanitation, hygiene,
and the environment

SWAROVSKI
WATERSCHOOL

ACTIVITY 5.2: MAKING A RAINWATER CATCHMENT SYSTEM

We use water in many different ways. In some places, people are fortunate to have easy access to water that is safe, clean, and readily available in homes and schools at the turn of a tap. But millions of people around the world still do not have easy access to safe water nearby. Many children, and women, must make long, difficult journeys to collect water from unsafe sources. In some cases, students are kept from school in order to collect drinking water for their families.

Rain is the greatest source of freshwater. It can be stored and reused, offsetting the need for processed or treated water. Many of the activities for which we use water—such as watering our gardens, cleaning our houses, and flushing toilets—can be done safely with harvested rainwater. It is important to note, however, that this water cannot be used as a source of safe drinking water unless it is filtered and treated.

Rainwater harvesting allows individuals and communities to manage their own water supplies. The term “rainwater harvesting” refers to the collection and storage of rainwater that runs off surfaces as it falls from the sky. Rainwater harvesting directs water from rooftops or other built surfaces into barrels or tanks. The water stored in these vessels can be used to carry out many everyday tasks.

In this activity, children will create a simple rainwater catchment system and learn its key components. This project is most likely to be appropriate for older students, ages 12–18.

Time: 90 minutes / **Thematic Areas:** Science, Environmental Education /

Goal for Learning: Gain access to water for schools, homes, or the wider community by catching rainwater and storing it.



Materials: □ Small, clean plastic bottles (1 for each student to use as a “rain barrel”) / □ Scissors / □ Mosquito netting or other finely meshed fabric; each student’s rain barrel will need a piece of netting approximately 30 × 30 centimeters (12 × 12 inches) / □ Cellophane tape or glue stick / □ 1 piece of aluminum foil for each barrel, 30 × 30 centimeters (12 × 12 inches) / □ 1 straw for each barrel / □ 1 cup of water for each student

ACTIVITY STEPS:

- 1 Cut the water bottle evenly across, around one-third of the way from the top. Students will use the bottom part of the bottle for a rain barrel and the top part can be used to make the funnel. Make sure the bottom part is securely placed on a surface and able to stand on its own.
- 2 Cover the top of the bottle with the mosquito net or fabric, and secure the covering with tape or glue. Emphasize that all rainwater catchment devices must be covered at all times to keep the water from being contaminated by debris, animals, insects, etc.
- 3 Ask students to use the aluminum foil, the straw, tape/glue, and scissors to create a device that will funnel water into the container, but not through the netting on top of the container. Encourage students to innovate and engineer the best way to get the water into the container. Then reset the devices firmly on a flat surface.

HINTS – Cut a hole in the side of the container, closer to the top than the bottom; the top of the water bottle or aluminum foil can be shaped into a funnel that drains into the container through the hole. The straw could also be inserted into the container through the hole. Students may need to prop the funnel part up against a wall or a box.

- 4 Test the students' devices by pouring a cup of water into the channeling funnel or straw, without touching the device or the container. Note that if it is raining hard, or if water is poured too quickly, the funnel will overflow, causing flooding below. A catch basin can be very helpful in capturing and using this overflow in a constructive way. The aim is to represent a real-life water-harvesting system, in which rain is captured as it falls, without human intervention, while minimizing the damage that can be caused by excess water, i.e., flooding.

ACTIVITY 5.2



ADDITIONAL RESOURCES:

GardenGate Magazine, "How to Harvest Rainwater," www.gardengatemagazine.com/52droughttolerant

GrowNYC, "Rainwater Harvesting," 2105, www.grownyc.org/openspace/rainwater-harvesting

McClain, Michael E., "Balancing Water Resources Development and Environmental Sustainability in Africa: A Review of Recent Research Findings and Applications," *AMBIO: A Journal of the Human Environment*, 2013, vol. 42, pp. 549-565. Available at: <http://link.springer.com/article/10.1007%2Fs13280-012-0359-1>

Nelson, Ben, "Build a Rainwater Collection System," *Mother Earth News*, July 24, 2013, www.motherearthnews.com/diy/build-a-rainwater-collection-system-zb0z1307zsal.aspx

Stockholm Environment Institute, *Rainwater Harvesting: A Lifeline for Human Well-Being*, Nairobi: United Nations Environment Programme, 2009. Open PDF from: www.unwater.org/downloads/Rainwater_Harvesting_090310b.pdf

UNEP, "Potential for Rainwater Harvesting in Africa: A GIS Overview," United Nations Environment Programme, October 2005. Open PDF from: https://www.researchgate.net/publication/265842568_Mapping_the_Potential_of_Rainwater_Harvesting_Technologies_in_Africa_A_GIS_Overview_on_Development_Domains_for_the_Continent_and_Nine_selected_Countries



WATER CATCHMENT
SYSTEM EXPLAINED BY A
STUDENT, SWS BRAZIL