**OBJECTIVES**

At the end of this lesson, the students shall be able to do the following:

1. Discuss the purpose of water storage tank in water systems;
2. Conduct an experiment with water pressure and gravity flow; and
3. Create a water quality logo to be used on water tanks.

**BACKGROUND INFORMATION**

Almost all public water systems use water tanks for storage. Water is usually supplied by wells or a network of pipes carrying water to customers, called the distribution system. When wells or distribution systems are not available, people can collect rainwater themselves and store it in a tank. The rainwater can be collected from roofs or in open, lined areas and funneled into a series of pipes that move the water into the tanks or into a cistern. Storage tanks hold water not only for immediate use, but they also save it for future use when there is no more rain to collect. As these tanks become partially empty, pumps from the cistern turn on to provide more water to the tank. **Water not used by the customers is available to refill the storage tanks.** Therefore the water changes out in the tanks almost daily and stays fresh. The height of the tanks and, thus, the level of water in the tank provides pressure to move the water through pipes to users and provides the pressure needed at each faucet. Ground tanks are more economical to construct than elevated tanks but must be located on a high hill to provide the elevation to provide pressure. For each 2.3 feet of elevation, 1 pound of pressure is available and thus a tank 120 feet tall when full can provide 52 pounds pressure \( \frac{120}{2.3} \approx 52 \text{ psig} \) which is sufficient to operate a toilet or allow a water to come out of a sink.

Elevated water tanks can be made of clay, concrete, steel, or can be bought as large plastic tanks from local stores. Steel tanks can rust and must be protected by special paint systems. Sometimes, though, lead paint was used as a primer paint and, as the coating wore off, the lead paint could contaminate the water inside the tank. The easiest and most affordable option is the large 750 liter tanks that can be bought in stores around San Cristobal and Tuxtla.

**ADVANCE PREPARATION**

A. Visit and describe the water storage tank in the courtyard of the school.

**PROCEDURE**

I. Setting the stage

   A. Find the locations of all the local water tanks on a map of San Cristobal.
   B. Share the background information.
   C. Classify the local water tanks as elevated or ground.
I. Activities
A. Experiment to demonstrate water pressure and gravity flow.
   1. Make three holes in the coffee can and plug them with paper plugs that can be easily removed. Fill the can with water.

   ![Coffee can with holes](image1)

   2. Have students hold a ruler out beside each hole. Simultaneously remove the plugs and allow the water to spray into the dish pan. Measure the greatest projection from each hole.
   3. Compare the measurements and hypothesize about why this happened.
   4. Run a second test to check your results. How is this knowledge important to designers of water tanks?

B. Create a design and a logo for the sides of a water tank. The message should convey an environmental message. Choose any of the water tank designs. These could be made poster board size and used as a community center display.

III. Follow-Up
A. Invite the local water utility manager (or someone from ECOSUR?) to your classroom to talk about local water tanks. Ask questions about how they are cleaned and how long the water is stored.