

# Way to Flow- Water Irrigation

## Lesson Objective

In this lesson, students will work in teams to design and build a system to move water from one source to two different delivery areas, while learning about the engineering design process.

## Activating Prior Knowledge & Concept Building

Begin the activity by explaining to students that they are going to be exploring how civil engineers have solved the challenge of moving water via irrigation. Ask students if they know why irrigation is efficient and effective. Ask your students what challenges engineers might encounter in the designing process in settings such as agriculture.

**Background knowledge:** Through the centuries, man has needed to move water from one place to another. Engineered irrigation has proved critical throughout the world.

## The Science Behind It

**Irrigation** is the artificial application of water to soil to produce plant growth. In the broadest sense, irrigation includes watering a lawn or garden. However, the term usually means the supplying of rather large amounts of water to grow crops in arid (dry) regions. Under extremely arid conditions, irrigation takes the place of rainfall. In regions where rainfall is scant, irrigation may provide an alternative to dry farming. Where rainfall is abundant but uncertain, irrigation gives protection against occasional droughts. Under all circumstances, irrigation is a method of producing crops on a controlled schedule of cultivation and harvest.

## Materials:

- Student Worksheet
- Water basin and water for testing student irrigation systems
- Straws
- Cardboard
- Paper Cups
- Clay
- Foil
- Rubber bands
- Tape
- Glue
- Toothpicks
- Any other reusable material

## Instructions for Instructor:

1. Distribute materials to your class.
2. Divide students into groups, providing a set of materials per group.
3. Explain that students must work as a team to design an irrigation system to move two cups of water a distance of at least three feet. The team has a goal of splitting the water into two separate containers of exactly one cup each.
4. Students meet and develop a plan for their irrigation system. They draw their plan, and then present their plan to the class.
5. The teams next execute their plans. They may need to rethink their design, or even start over.

6. Next, teams will test their irrigation system to see how it works. Students will measure how much water is gathered in each of the two destination containers and see how close their water is to the goal of one cup in each container. The teams may test their systems three times and count the most successful test.
7. Teams then complete an evaluation/reflection worksheet, and present their findings to the class.

## Closing

Review the activities of the day with the students and assess what concepts they took away or what they missed. List the key learning points on the board. Have students reflect on the activity by sharing out and writing about it in their science journals (or activity document).

**Debrief Questions:** Did you succeed in creating an irrigation system to split the two cups of water into two separate destination containers? What was your best result? If your system failed, what do you think went wrong? What was unique about either the design or construction of the irrigation system that had the best results on this challenge in your classroom? Did you decide to revise your original design while in the construction phase? Why? How?

Source: <http://teachers.egfi-k12.org/lesson-way-to-flow-water-irrigation/>