

Engineering Challenge - Who's Thirsty?

Student Guidelines and Requirements

Access to clean, drinking water is necessary to living things. There are times, however, that water is not going to be available and you have to carry it with you. In this challenge, your team will work together to invent a contraption/device that can transport water from a main water supply to various distribution places in a relay race. Your teacher will provide you with an initial set of materials and "Discovery Dollars" to purchase additional materials. You should use available materials creatively while budgeting your "Discovery Dollars" to purchase additional supplies to construct the device. In Part 1, you will plan and design your device. In Part 2, you will test your device in a relay. The following is a list of supplies that may be provided by your teacher.

Materials:

- Supplies (per team)
 - sticks or dowels of various sizes
 - rubber bands of various sizes
 - balloons
 - 3 wooden rulers
 - 1/2 cup measuring cup
 - paddle ball paddles
 - baseball cap
 - empty styrofoam egg cartons
 - long tube sock
 - drinking straws
 - 3 film canisters
 - small blocks of wood
 - pool "noodle"
 - tote or container to hold these items
- "Discovery Dollars"
- Tool Kit (per team)
 - duct tape
 - electric tape
 - twine/string
 - flat thumb tacks
 - screw driver
 - screws that match the driver
 - scissors
 - super glue
 - permanent marker
 - tote or container to hold these items

Part 1: Your team is required to submit a plan on paper of what your device will look like and how it will work before construction. Your team's device **MUST** utilize three different objects. Include in your plan a budget for materials purchased using Discovery Dollars. Upon approval of your design plan, your team should construct the device.

Design Your Device to meeting the following goals:

- 1 Utilizes three different objects
- 2 Can hold and transport water.
- 3 Minimizes the amount of Discovery Dollars needed for materials.
- 4 Keep the number unused purchased materials to a minimum.

Part 2: Each team will compete in a relay-style game, and the winning team will be the team that completes the relay in the least amount of time. Your teacher will set up a relay similar to the [Are You Thirsty Relay diagram](#).

Game Guidelines:

Student 1 starts at the starting line, while student 2, student 3, and student 4 stand at distances determined by the facilitator. Students 2, 3, and 4 are each holding a cup with a fill line clearly marked.

Each team of 4 will proceed with the relay as follows:

- Student 1 will start off using the invention to collect water from the pitcher/bucket.
- Student 1 will then transport the water to the cup held by student 2.
 - *Teacher will specify distance to travel.*
- Once the water level reaches the fill line, student 1 takes the cup from student 2 and gives student 2 the device.
- Student 2 will then use the device to fill student 3's cup, then swap with student 3.
- Student 3 will repeat steps to fill up student 4's cup and swap.
- Student 4 will travel to the finish line and fill the cup at the finish line.

Note: If at any point in the relay, there is not enough water in the device to fill the cup, the person with the device must return to the bucket to get more water.