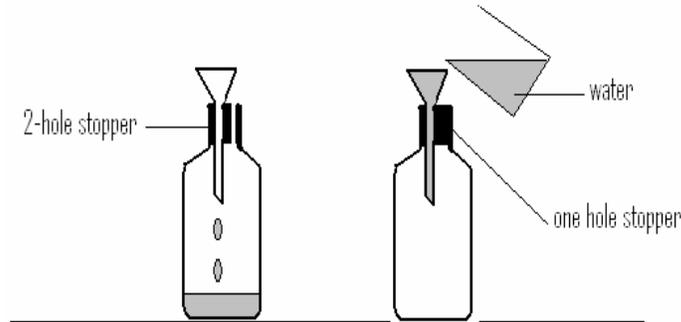


## THE REFUSING FUNNEL

**A. Question:** *Will water defy gravity?*



**B. Materials Needed:**

1. Two identical glass or plastic funnels with a narrow stem
2. One two-hole stopper & one one-hole stopper
3. Two identical empty jars

**C: Procedure:**

1. Set up the jars so that the stoppers are positioned snugly and the stems of the funnels are placed within the holes of the stoppers.
2. Fill the funnels with water. Water will run through the funnel and into the jar which has the two-hole stopper. For the jar with the one-hole stopper, the water will remain in the funnel.
3. Take the jar with the two-hole stopper by the neck, and cover the second hole with your forefinger.
4. Keeping the hole covered, use your other hand to pour additional water into the funnel. Give the students enough time to see what happens before removing your finger.
5. Now, take the jar with the one-hole stopper and squeeze the stopper so that water will run through.

**D: Anticipated Results:**

Students should expect to see water flow through the funnel that is inserted into the jar with the two-hole stopper. Water will cease to flow through this funnel when the second hole is covered up. Water from the funnel that is inserted into the one-hole stopper, will be released once the stopper is squeezed.

**E: Thought Questions for Class Discussion:**

1. Before pouring the water, ask: "What is in the bottle?"
2. Why is the water only running through in one bottle?
3. After step 3 of the procedure, ask: "Why has the water stopped flowing from the funnel?"
4. What is holding back the flow of water?
5. Before performing step 5 of the procedure, ask: "How can we let the water run through this funnel?"

**F: Explanation:**

Each jar is filled with air. In the jar with the two-hole stopper air is allowed to escape through the second hole. And thus, water runs through the funnel. But in the jar with the one-hole stopper, there is no way for the air to escape and this holds back the water. There is limited space within the jar. For water to be added to it, something must be released. In this case, that something is air.