Merging Streams

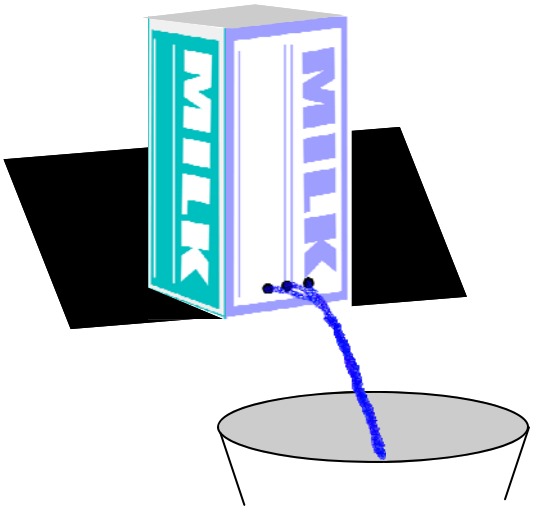
Science IDEAS Project
Teacher Science Demonstration

Goal:

To demonstrate the strength of **cohesion** between water molecules.

Materials:

- Empty milk carton or other similar sized container. Flat sides are better than curved sides
- Water
- A tool to punch a clean hole with
- A sink or bucket to catch the water in



Procedure:

1. Make three small holes 1/2 cm apart on a horizontal line across the bottom of the container.
2. Position the container on the side of a sink, or on a table edge with a bucket underneath.
3. Fill the carton with water, and observe the streams of water that come out of the holes.
4. Use your fingers to direct the two outer streams into the inner one. Observe what happens when you take your fingers away.

Note: You may want to have a student standing by with some extra water to refill the carton when it gets low.

Journaling Opportunities:

- What causes the water to squirt out of the holes?
- Observe what happens to the streams as the water level in the carton drops. Explain your observations.
- What force is responsible for the streams staying together once their paths have changed?

What Happened?

The pressure of the water above the holes pushing down to the bottom of the carton is responsible for the streams squirting out. Each individual water molecule is pushed out of the hole, and is pulled down by gravity. The individual streams are held together by cohesion. Without cohesion, the streams would break apart like a mist. Think of what would happen if you blew flour out of a straw.

When you move the streams towards each other, molecules from each stream get close enough for their cohesive forces to attract one another. The cohesion within and between the streams merge the water together into one stream.

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