



## Curiosity Guide #206

### Liquid Forces

Accompanies Curious Crew, Season 2, Episode 6 (#206)

#### Screen Jar

Investigation #1

#### Description

Amaze your friends and learn about two forces that attract in this fun demonstration.

#### Materials

- Canning jar with two-part metal lid
- Scrap window screening
- Marker
- Snips
- Water
- Pitcher
- Spoon
- Basin
- Food coloring

#### Procedure

- 1) Separate the metal insert from the lid of the canning jar.
- 2) Lay the metal insert on a piece of scrap window screening.
- 3) Trace the circumference with the marker.
- 4) Carefully cut out the screen circle with snips.
- 5) Test the circular screen to ensure that it fits in the threaded-circle lid. Adjust as necessary.
- 6) Screw on the cap with the screen circle wedged in the opening.
- 7) Fill a pitcher with water.

- 8) Add a few droplets of food coloring to the water. Stir.
- 9) Pour the water through the screen lid to demonstrate that the lid is porous.
- 10) Pour the water out of the jar and back into the pitcher.
- 11) Once again, fill the jar with water from the pitcher by pouring through the screen lid.
- 12) Hold the jar with your strong hand over a basin, sink, or pitcher.
- 13) Position your strong hand so that the jar is sitting in your palm and your fingers are grasping the sides of the jar.
- 14) Quickly turn the jar upside down.
- 15) Did you capture some water?
- 16) What happens if you tilt the jar?
- 17) Try it again and try to capture more.

My Results

## Explanation

When the jar is inverted, or turned upside down, the water has to break up into tiny streams to pour out. However, **cohesion** is causing those droplets to stick together. Cohesion is the attractive force between the same kinds of molecules.

Droplets are also sticking to the screen, using the attractive force of **adhesion**, which is the attraction of different kinds of molecules. In this example, the water and the metal screen are attracted through adhesion. Air pressure is another factor, as the air needs to get into the jar to replace any water that comes out.

You may notice that if you attempt this action when the screen is fairly dry, it doesn't work as well. You prepared the jar by pouring the water in and out a couple of times, which activated the force of adhesion. Droplets had already begun to cling to the screen, which made the liquid forces stronger when you inverted the jar quickly.

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