



## Curiosity Guide #607

### Convection

Accompanies Curious Crew, Season 6, Episode 7 (#607)

#### Ice Circulation

Investigation #4

#### Description

Elevator ice cubes? Come on! Is that really possible?

#### Materials

- Water
- Ice-cube tray
- Freezer
- Dark food coloring
- Glass
- Warm water

#### Procedure

- 1) Fill an empty ice tray with water.
- 2) Add numerous drops of dark food coloring to each cell.
- 3) Place the tray in the freezer.
- 4) Fill up a clear glass with warm water.
- 5) Get the frozen colored cubes from the freezer.
- 6) Add a single ice cube to the glass of warm water.
- 7) What do you notice?

## My Results

### Explanation

As the ice begins to melt in the warm water, part of the water cools down. The water molecules start to collide more slowly, take up less space, and become denser. As a result, the colored water begins to sink toward the bottom of the glass. Then as the colored water begins to warm up, the particles collide more quickly, take up more space and become less dense again. The warmed particles rise to the top of the glass, only to be cooled down once again. This circular motion is called a convection cell. Convection cells occur in fluids like liquids and gases. Adding food coloring to the convection process shows the rising of the warmer, less dense liquid and the sinking of the cooler, denser liquid. This is the same kind of motion of energy transfer that is observed in the atmosphere, the ocean, and even in the mantle of the earth.

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