Name: _____ Date: _____

Learning about Air

1. The Magic of the "Empty" Glass

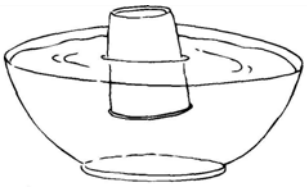
a. Look at the glass before the experiment begins. Is it empty? Why or why not? _____

b. Predict what will happen when the glass is placed straight upside down in the water: _____

_____

c. What happened? Why? _____

_____



2. The Shape of Air

a. What is the shape of air? _____

b. Can it change shape? Why or why not? _____

_____

c. Predict what will happen if we move the air from one glass to the next:

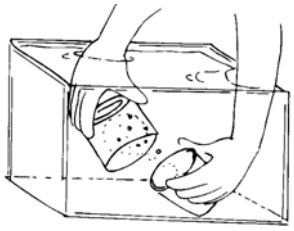
_____

_____

d. What happened to the shape of the air? Why? _____

_____

_____



3. Blowing Up a Balloon Without Adding Air

a. Do you think it is possible to blow up a balloon without adding air? Why or why not? _____

_____

b. Predict what you think will happen if we put the bottle with a balloon over the mouth in a bowl of hot water: _____

_____

c. What happened? Why? _____

_____

d. Now predict what you think will happen if we put the bottle in cold water:

_____

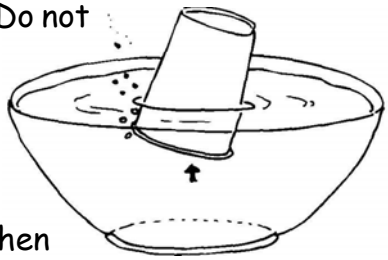
_____

e. What happened? Why? _____

_____

The Magic of the "Empty" Glass

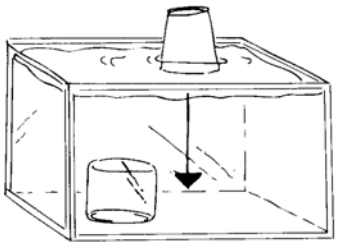
Fill a big bowl or fish tank with water. Hold an "empty" glass upside down and press it down into the water. Make sure it is straight up and down. Do not tip it. Look at the glass through the water. (The water does not go in it. To prove this, you might want to stuff a piece of paper at the base of the glass, then show it is dry.) Ask: "Why doesn't the water do into the glass?"



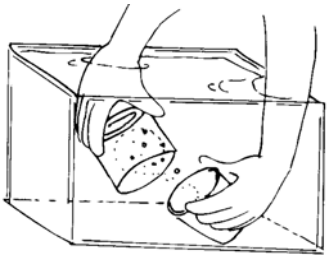
Tip the glass just a little so that a bubble of air can escape. (When the air goes out, there is empty space in the glass. Water goes in.)

The Shape of Air

Take two glasses of different shapes. Put one glass into a fish tank filled with water and let it fill. Put the second glass into the water mouth down. Ask "What is keeping the water out of the glass? What shape is the air in the glass?"

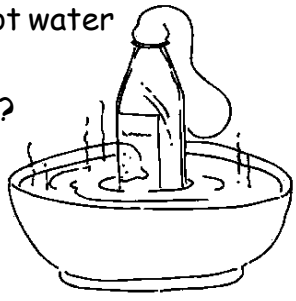


Set the second glass on the bottom of the tank. Tip the first water-filled glass so that it is above the glass with air in it. Tilt the glass with air in it to allow air bubbles to escape. Catch the bubbles in the water-filled glass. (The air bubbles will push the water out of the first glass and take the shape of the second glass.) Have students describe how the air changed shape.



Blowing Up a Balloon Without Adding Air

Fit a balloon over the mouth of a bottle. Stand the bottle in a bowl with very hot water. (Be sure the children are standing well back from the hot water in case of any splashing.) Watch the balloon inflate.



Now place the bottle in a bowl of cold water. Ask: "What happens? Why does the balloon get bigger and smaller?" (When the air in the bottle is warmed by the hot water, it needs more space so it moves into the balloon, "blowing" it up. When the air is cooled by the cold water, it contracts and needs less space, so the balloon goes down.