

Air – It's Really There!

Gases are all around us, but we can't see them. Air is actually a mixture of different gases. Does air take up space? Let's find out.

Materials:

- Bucket or aquarium (3/4 filled with water)
- 3 clear plastic cups
- Paper towel

Procedures:

1. Turn one cup upside down over the water. Slowly push the cup down under the water as shown.



2. Look carefully at the cup when it is underwater. What is inside the cup? Would you say the cup is empty, or is it full of something?
3. Keep the cup under water. Now take a second cup and lower it into the water so that it fills up with water. Now turn this cup upside down.
4. You should now have one upside down cup filled with air and one upside down cup filled with water.
5. Hold the air-filled cup below the water-filled cup as shown.
6. Tilt the lower cup so that bubbles flow up into the higher cup that contains the water. What do you see? You have just "poured" air from one cup into the other. Try to pour it back and forth, from one up to the other.

7. Now take both cups out of the water. Take a dry cup and wad up a paper towel and stuff it into the bottom of the dry cup, as shown.



8. Turn this cup upside down and lower it all the way down into the water. Pull the cup straight up so that it comes out of the water. Look at the towel. Is it wet or dry? What kept the water from reaching the towel?

Think about this ...

Here's another way that gas takes up space. Get an empty plastic soda bottle. Take a little piece of paper towel or tissue and cut or tear it to a size slightly larger than the opening of the bottle. Place the paper on the bottle and then try blowing the paper into the bottle. What happens?

Where's the Chemistry?

In "Air- It's Really There!" you poured gases from the lower cup filled with air into the higher cup filled with water. The air from the lower cup went as far up into the water-filled cup as it could. Since air takes up space, it went to the back of the cup and pushed the water out. When you put the paper towel in the bottom of the cup and then pushed the cup into the water, the air inside the cup was taking up most of the space, so very little water could enter the cup.



The American Chemical Society develops materials for elementary school age children to spark their interest in science and teach developmentally appropriate chemistry concepts. The *Activities for Children* collection includes hands-on activities, articles, puzzles, and games on topics related to children's everyday experiences.

The collection can be used to supplement the science curriculum, celebrate National Chemistry Week, develop Chemists Celebrate Earth Day events, invite children to give science a try at a large event, or to explore just for fun at home.

Find more activities, articles, puzzles and games at www.acs.org/kids.

Safety Tips

This activity is intended for elementary school children under the direct supervision of an adult. The American Chemical Society cannot be responsible for any accidents or injuries that may result from conducting the activities without proper supervision, from not specifically following directions, or from ignoring the cautions contained in the text.

Always:

- Work with an adult.
- Read and follow all directions for the activity.
- Read all warning labels on all materials being used.
- Wear eye protection.
- Follow safety warnings or precautions, such as wearing gloves or tying back long hair.
- Use all materials carefully, following the directions given.
- Be sure to clean up and dispose of materials properly when you are finished with an activity.
- Wash your hands well after every activity.

Never eat or drink while conducting an experiment, and be careful to keep all of the materials used away from your mouth, nose, and eyes!

Never experiment on your own!

For more detailed information on safety go to www.acs.org/education and click on "Safety Guidelines".

