

# 7.1

## Fluids Everywhere



**Figure 1** All homes contain many different fluids.

**fluids:** materials that have no fixed shape and are free to flow, such as liquids and gases

You likely think of water when you hear the word “fluid,” since water is a fluid you use many times a day. We drink water and wash with it. We cook and clean with water. We see it in the rain that falls and the rivers, lakes, and oceans that cover Earth. We travel on it in boats and through it when swimming. Yet water is just one of many fluids we encounter daily. Examine your home, and you will find that many kinds of fluids play a role in your life (Figure 1).

We live in a world full of fluids, but not all fluids are liquids. **Fluids** are substances that flow, so gases are fluids, too. The atmosphere that surrounds Earth (Figure 2) is a fluid that is crucial to all life forms on the planet. Unfortunately, we harm the atmosphere when we release dangerous gases into the air from cars, factories, and landfill sites (Figure 3).



**Figure 2** Two fluids essential for life—water and air—cover and surround our planet.



**Figure 3** Human activity has an impact on the health of fluids.

### TRY THIS: Counting Fluids

**SKILLS MENU:** performing, observing, analyzing, communicating



In this activity, you will count and classify the fluids in your home. Think about fluids you eat, spray, cook, and clean with.

1. Go from room to room in your home. In a table similar to Table 1 below, list all the fluids you find.

**Table 1**


Room	Fluid found	Category of fluid	Safety warnings



Get your parents' permission before handling containers of fluids. Handle all containers of fluids safely.

2. Group the fluids into categories according to how we use them (for example, fluids for cleaning, for cooking, for eating, and so on).
3. Make note of any special safety warnings.
  - A. How many of the fluids you listed were liquids? How many were gases?
  - B. Compare the number of fluids used for cleaning to those that are food or products used in food preparation.
  - C. Which fluids could cause harm to you or to the environment if used or disposed of improperly? Explain.
  - D. Compare your list with those of your classmates. Add any new fluids that are interesting or important.

## Fluids for Life

Not only do we use fluids, such as air and water, to stay alive, the human body is mostly made of fluids. Each of us is about 60–70 % water. Table 2 shows other fluids our bodies make and use. 

To learn more about the role of body fluids,

**Go to Nelson Science** 

**Table 2** Some Fluids in the Human Body

Fluid	How it is used by the body
oxygen	releases energy from food
blood	acts as a transport system (Figure 4) to take materials to cells as well as gather wastes from cells
sweat	cools the body
saliva	lubricates food for swallowing and begins chemical digestion
urine	eliminates dissolved wastes from the body
stomach acid	aids chemical digestion of food



**Figure 4** Blood travels throughout the human body via arteries (red) and veins (blue).

Several systems within your body make, use, or move some of the fluids listed in Table 2. These systems include the circulatory system, the respiratory system, and the urinary system. Sometimes technology is needed to maintain the health of our bodies' fluid systems.

Our body cells produce waste continuously. This waste is carried in the bloodstream and could harm or kill us if it were not removed. Kidneys filter waste from the blood and dispose of it in urine. For people whose kidneys do not work properly, a dialysis machine performs this function (Figure 5). Blood flows through a tube into the machine, is cleaned, and then returns to the body. Each dialysis treatment takes four to five hours. Dialysis does not replace all the kidneys' functions.



**Figure 5** This patient must come to the hospital for dialysis treatment every two or three days to have her blood filtered mechanically.

### LINKING TO LITERACY

#### Reading Tables

To read a table, start by looking at the table title (“Some Fluids in the Human Body”). This tells you the type of information in the table. Next, look at the column headings (“Fluid” and “How it is used by the body”). These tell you where to locate specific information about fluids in the table. Finally, read each row. Here, you will find the details about each fluid sorted by column heading. Information listed across each row is usually connected in some way.

### CHECK YOUR LEARNING

1. What are fluids?
2. Name three fluids that are essential to life. Cite evidence from this section to justify your answer.
3. Blood is a critical body fluid. What role does blood play in the body? How is it usually cleaned, and how is it cleaned during dialysis?