

Parts of the Circulatory System: Blood Is Thicker Than Water

Now you know that the circulatory system carries food, oxygen, and water to all the cells of the body. It also removes waste from the body cells while it is helping the body keep the right temperature, fight disease and infection, and carry chemicals. The heart is a very important organ that pumps the blood through the body. Blood vessels are tubes that carry the blood. Finally, let's see what blood really is.

How Much Is Enough?

First of all, you have plenty of blood. Most people have about 12 pints of blood. Let's review some of our measuring skills. Two cups equal one pint. There are two pints in a quart and four quarts in a gallon, which means that there are sixteen cups or eight pints in a gallon. If you have about 12 pints of blood, that means you have about one and a half gallons of blood in your body. If you prefer to measure using liters, you have about five or six liters of blood. If you had some two-liter soda bottles, and you filled three of them, that would be about the same as the amount of blood in a body.

Once in a while, we all cut ourselves. We lose a bit of our blood. How much blood can we lose? Doctors believe that we can lose one and a half or two liters of our blood and still survive. If we lose more than that, we may not be able to keep our bodies alive.

Your blood is made up of four basic parts: plasma, red blood cells, white blood cells, and platelets. Each part of your blood looks different and has a different job to do.

Plasma

Plasma is the liquid part of your blood. Water makes up 90 percent of your plasma. Your plasma also has salts and other chemicals in it. Plasma carries dissolved foods to the cells in your body. It also carries wastes from the cells to the parts of the body that will remove the wastes. Red blood cells, white blood cells, and platelets are also found in the blood's plasma. Plasma makes up 55 percent of all your blood.

Red Blood Cells

Red blood cells make up about 44 percent of your blood. They are responsible for carrying oxygen to all the cells in your body. When they give up oxygen to the cells, they pick up carbon dioxide, a waste, from the cells and carry it to the lungs where it is removed from the body. Red blood cells are made in your bone marrow, and they are living cells. However they do not have a nucleus. Red blood cells live for about 100 to 120 days. Your bone marrow makes about $\frac{1}{2}$ cup of new red blood cells every day.

Why is your blood red? Red blood cells contain a special protein called **hemoglobin**. When hemoglobin combines with oxygen, it turns bright red. That is the color you see when you prick your finger or cut yourself and start to bleed. When hemoglobin is not combined with oxygen, it is a very dark red. It looks purple or blue when you see it through your skin and through the walls of your veins.

White Blood Cells

White blood cells make up a much smaller percentage of your blood, but they are very important cells. They are living cells with a nucleus. They are made in the spleen and in the lymph nodes. White blood cells form an army in your blood. They march through your blood vessels looking for germs to destroy. White blood cells also make antibodies. Antibodies are special chemicals that fight off specific diseases in your body.

When I was in college, I started to get very sick. The doctors were not sure what was wrong with me. They took some of my blood and counted the number of white blood cells. The number was too high. The doctors knew there was some kind of infection in my body. They did some further checking and decided to operate. They removed my enlarged and infected appendix. After the operation, I felt much better and was quickly on the road to recovery. I am very glad that my white blood cells helped the doctors figure out what was wrong with me!

Platelets

The fourth important part of your blood is called the platelets. Together with white blood cells, platelets make up the final one percent of your blood. Platelets are formed from bone cells in your bone marrow. They are not living cells. Platelets help your blood clot.

If you cut yourself, you will bleed. You do not want to lose too much of your blood. Platelets rush to the cut and use a special protein called **fibrin** to start making a special net. The net traps cells and makes a blood clot. The clot gets large enough to stop the bleeding, and then it makes a scab. After a while, the scab dries up and falls off. The cut is healed, and your blood can continue to do all of its important jobs.

Have you ever had a bruise? Do you know what it is? A bruise is actually made from blood clotting under the skin. Remember that you have lots of tiny capillaries. If you bump into a table or chair, the tiny capillaries under your skin may break open. You might have a little bleeding under the skin. The platelets rush in and make the blood clot. Then you notice a bruise. After a while, the injured area heals up and the bruise goes away.

You know it is important to get lots of calcium to keep your teeth and bones strong. It is also important for your blood. Platelets need calcium to be able to clot your blood. Calcium, of course, is found in milk and other dairy products. Keep drinking milk and eating cheese. It is helping your body in many different ways.

Name: _____

Date: _____

Questions

1. How much blood do most people have?

Finish the following sentences.

2. Fifty-five percent of your blood is _____.
3. Ninety percent of your plasma is _____.
4. Plasma will carry _____ to the cells in your body.
5. Plasma also carries _____ away from the body cells.
6. _____, _____, and _____ are also found in the plasma.
7. Forty-four percent of your blood is _____.
8. Red blood cells carry _____ to the cells and pick up _____ from the cells.
9. Red blood cells are made in your _____.
10. The protein called _____ makes your blood red when it is carrying oxygen.
11. White blood cells are made in the _____ and _____.
12. White blood cells try to destroy _____ in your body.
13. White blood cells make _____ to fight off specific diseases.
14. Platelets help your blood _____.
15. Platelets use a special protein called _____ to help stop bleeding.
16. You should drink lots of milk because your platelets need _____ to be able to clot your blood.