What's in Your Blood?

What makes up human blood and how is blood analyzed?

Description

Doctors often send a sample of your blood to a testing lab, to make sure you're healthy. What do medical labs do with this blood? Make a model of a human blood sample, and test it in a centrifuge in a way similar to what medical labs do.

Age Level: 10 and up

What makes up human blood and how is blood analyzed?

Materials

- Small, clear bottle or container (empty spice jar or pill bottle) with secure lid
- Approximately 50 mL (1/4 cup) of cooking oil
- Approximately 50 mL (1/4 cup) of red sugar sprinkles
- Empty plastic soda or water bottle
- Sharp scissors
- Approximately 75-cm long piece of string
- Strong tape

Note

Clear packing or duct tape work well for this activity. Most types of cooking oil will work for this activity.

Time

Preparation: 10 min
Activity: 15 min
Cleanup: 5 min

Step 1

Start by making a model of a human blood sample. Fill the small container halfway with oil. This oil represents the plasma in your blood. Real plasma is a yellowish mixture of water, sugar, fat, protein, and salts.

Step 2

Fill the rest of the container with red sugar sprinkles, but leave a little room at the top. The sprinkles represent red blood cells in your blood. Place the cap on the container and shake to mix the plasma and red blood cells. You now have a model of a human blood sample.

Step 3

When the doctor sends your blood sample to the lab, laboratory staff may use a device called a centrifuge to spin the blood sample for analysis. To build a model centrifuge, first cut off the top third of the soda or water bottle. You may need help with this step.

Step 4

Tie a knot in each end of the string. Tape the string to the cut top of the bottle to create a handle. The knots should keep the string from sliding out from under the tape.

Step 5

Shake your blood sample to mix the oil and red sugar sprinkles. Place the model blood sample container (top up) in your centrifuge.

Step 6

Carefully swing the centrifuge around, about 40 times. It's best to do this outside in case the centrifuge breaks.

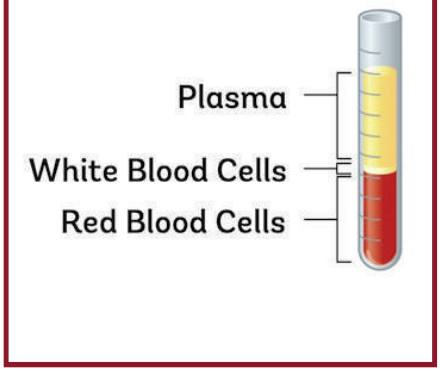
Step 7

When you're done swinging, take a look at the blood sample. What happened to the red blood cells and plasma?

What's Going on?

Blood is a fluid in your body that does many things. It carries nutrients to your cells, removes waste products from your cells, makes sure all parts of your body are warm enough, and much more.

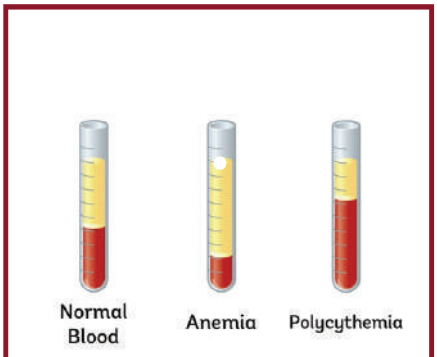
Blood is made up of red blood cells, white blood cells, and plasma. Red blood cells carry oxygen to your cells. Red blood cells float in plasma (mostly water), which also carries nutrients to and from your cells so they can function properly. Red blood cells are denser than plasma. When blood is put in a centrifuge like the model you made, heavier red blood cells move to the bottom, while plasma stays at the top.



What's is your Hematocrit?

Your doctor may need a sample of your blood to have tested for health problems. One part of this test determines your blood's hematocrit. The hematocrit is a measurement of the percentage of your blood that is red blood cells. To find your hematocrit, a medical laboratory uses a method similar to how the centrifuge you made works.

For adult males, a healthy hematocrit is about 45%, and for adult females it's about 40%. If your hematocrit is low, this might be a sign of a medical condition such as anemia or malnutrition, where your body lacks key nutrients. If your hematocrit is high, this might be a sign of dehydration where your body lacks critical fluids, or other conditions.



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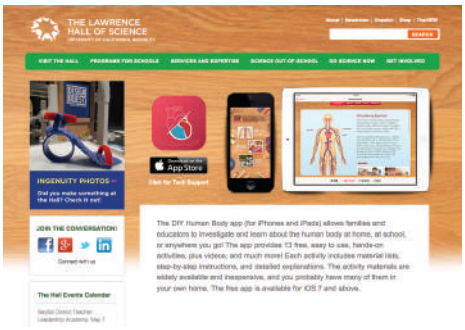

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Credits

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This activity from the DIY Human Body app allows families to investigate and learn about the human body at home or on the go! The app features thirteen hands-on investigations, as well as images & videos.