**Station 1: Red Blood Cells: Riding on the Red Road**

Red blood cells perform the most important blood duty. A single drop of blood contains millions of red blood cells which are constantly traveling through your body delivering oxygen and removing waste. If they weren't, your body would slowly die.

Red blood cells are red only because they contain a protein chemical called hemoglobin which is bright red in color. Hemoglobin contains the element Iron, making it an excellent vehicle for transporting oxygen and carbon dioxide. As blood passes through the lungs, oxygen molecules attach to the hemoglobin. As the blood passes through the body's tissue, the hemoglobin releases the oxygen to the cells. The empty hemoglobin molecules then bond with the tissue's carbon dioxide or other waste gases, transporting it away.

Over time, the red blood cells get worn out and eventually die. The average life cycle of a red blood cell is 120 days. Your bones are continually producing new blood cells, replenishing your supply. The blood itself, however, is re-circulated throughout your body, not being remade all of the time.

Since the human body is continually making more blood, it is safe for healthy adults to donate blood. The blood is then stored for use in emergency situations. Initially after giving blood, the donor may feel some momentary lightheadedness due to the loss of oxygen-rich red blood cells and blood sugar. The body quickly stabilizes itself.

Question 1: What gives red blood cells their color?

Question 2: What is the job of the red blood cells?

Question 3: How long does a red blood cell live on average?

**Station 2: White Blood Cells: Battling Blood Cells**

Whenever a germ or infection enters the body, the white blood cells snap to attention and race toward the scene of the crime. The white blood cells are continually on the lookout for signs of disease. When a germ does appear, the white blood cells have a variety of ways by which they can attack. Some will produce protective antibodies that will overpower the germ. Others will surround and devour the bacteria.

The white blood cells have a rather short life cycle, living from a few days to a few weeks. A drop of blood can contain anywhere from 7,000 to 25,000 white blood cells at a time. If an invading infection fights back and persists, that number will significantly increase.

A consistently high number of white blood cells is a symptom of Leukemia, a cancer of the blood. A Leukemia patient may have as many as 50,000 white blood cells in a single drop of blood.

Question 1: What is the job of the white blood cells?

Question 2: How long does a white blood cell live?

Question 3: Why might having a really high white blood cell be bad?

**Station 3: Platelets: Sticky Situations**

The human body does not handle excessive blood loss well. Therefore, the body has ways of protecting itself. When, for some unexpected reason, sudden blood loss occurs, the blood platelets kick into action.

Platelets are irregularly-shaped, colorless bodies that are present in blood. Their sticky surface lets them, along with other substances, form clots to stop bleeding.

When bleeding from a wound suddenly occurs, the platelets gather at the wound and attempt to block the blood flow. The mineral calcium, vitamin K, and a protein called fibrinogen help the platelets form a clot.

A clot begins to form when the blood is exposed to air. The platelets sense the presence of air and begin to break apart. They react with the fibrinogen to begin forming fibrin, which resembles tiny threads. The fibrin threads then begin to form a web-like mesh that traps the blood cells within it. This mesh of blood cells hardens as it dries, forming a clot, or "scab."

Calcium and vitamin K must be present in blood to support the formation of clots. If your blood is lacking these nutrients, it will take longer than normal for your blood to clot. If these nutrients are missing, you could bleed to death. A healthy diet provides most people with enough vitamins and minerals, but vitamin supplements are sometimes needed.

A scab is an external blood clot that we can easily see, but there are also internal blood clots. A bruise, or black-and-blue mark, is the result of a blood clot. Both scabs and bruises are clots that lead to healing. Some clots can be extremely dangerous. A blood clot that forms inside of a blood vessel can be deadly because it blocks the flow of blood, cutting off the supply of oxygen. A stroke is the result of a clot in an artery of the brain. Without a steady supply of oxygen, the brain cannot function normally. If the oxygen flow is broken, paralysis, brain damage, loss of sensory perceptions, or even death may occur.

Question 1: What is the job of the platelets?

Question 2: What is the name of an internal blot clot?

Question 3: What is a stroke?

## Station 4: Plasma: The Importance of Plasma

It's a straw-colored, clear liquid that is 90 percent water, and it is an essential ingredient for human survival.

It might seem like plasma is less important than the blood cells it carries. But that would be like saying that the stream is less important than the fish that swims in it. You can't have one without the other.

Besides water, plasma also contains dissolved salts and minerals like calcium, sodium, magnesium, and potassium. Microbe-fighting antibodies travel to the battlefields of disease by hitching a ride in the plasma.

Without plasma, the life-giving blood cells would be left floundering without transportation. Never underestimate the importance of plasma.

Question 1: What is plasma made of?

Question 2: What is the purpose of plasma?

(READ CAREFULLY!!!!!)

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