Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date\_\_\_\_\_\_\_\_\_\_\_\_\_

Understanding Blood

**Background Information**

In an animal, blood is the liquid in the circulatory system. All animals have blood, but its nature varies slightly from one species to another. However, the main components and functions of blood are the same in all animals.

**Plasma** is the liquid substance in which various solid materials are suspended and moved about. Plasma is 90 percent water. The other 10 percent consists of glucose, hormones, wastes, minerals, vitamins, proteins, and other substances. Plasma makes up 50 to 60 percent of blood by volume. Plasma has a straw color when the solid materials are removed.

Red blood cells, or **erythrocytes**, are responsible for carrying oxygen from the lungs throughout the circulatory system. The oxygen is carried by a protein part of the blood known as **hemoglobin**. Red blood cells have flexible membranes that allow them to squeeze through the very smallest blood vessel. Red blood cells do not repair themselves. However, new red blood cells are made in bone marrow. The spleen and the liver remove the dead red blood cells. Scientists have found that one animal may possess a trillion blood cells.

White blood cells, or **leukocytes**, are responsible for fighting disease and removing harmful substances from the body. Four different kinds of white cells are found in blood. Some white blood cells surround and digest infectious bacteria. Other white blood cells produce antibodies. An **antibody** is a kind of protein that destroys bacteria, viruses, and other substances that invade the body. Animals that are diseased produce increased numbers of white blood cells.

Platelets, or **thrombocytes**, are the structures in blood that are responsible for blood clotting. They are not complete cells and have a disk-like shape. In case of a wound, platelets stick to the edge of the skin and to each other to form a scab, or cover, that stops the flow of blood. Without platelets, an animal might bleed to death from a wound.

Blood, which is vital to the health and survival of all animals, consists of four major components. They are plasma, red blood cells, white blood cells, and platelets. Plasma is the liquid substance. Red blood cells carry oxygen and carbon dioxide. White blood cells fight disease. Platelets are responsible for blood clotting. Blood has five main functions in the body. They are transport of oxygen and carbon dioxide, protection against disease, transport of hormones, transport of nutrients and wastes, and regulation of body temperature.

**Lab Materials**

Red Hots Scale that reads in grams

Karo Syrup Dixie Cups

Sprinkles Spoon

Marshmallows Clear Plastic Cup

Granola Paper towels

**Lab Procedure**

Today, you will be asked to make a proportional model of a 50 g sample of blood.

1. In your clear cup, mass out 25.2 g of Karo Syrup
2. Next, using the paper towel as weigh paper, mass out 2.2 g of sprinkles and add to the syrup

*(Use your Dixie cup to transport the sprinkles to the scale, otherwise they end up everywhere!)*

1. Using the weigh paper, mass out 22.4 g of Red Hots and add to the syrup

*(Use a Dixie Cup to transport the Red Hots, too)*

1. Finally, mass out .2g of mini marshmallows and granola combined and add to the mixture

*(You will have to use part of a marshmallow and a few pieces NOT chunks of granola)*

1. Be sure to mix thoroughly!

Before you consume, answer the questions!

**Lab Analysis**

1. Draw what your sample looks like, be sure to use color:
2. What did each ingredient represent:

|  |  |  |
| --- | --- | --- |
| Plasma | Karo Syrup |  |
| Sprinkles |  |
| Cells | Red Hots |  |
| Mini Marshmallows |  |
| Granola |  |

1. Why does blood appear red?
2. If animal was anemic (reduced red blood cells), what would blood sample look like?

(Draw it in color)

1. When an infection occurs, the body produces high amounts of white blood cells that rush to the site. In color, draw what a sample of infected blood would look like.
2. Summarize what you have learned today in 2 sentences:

**Extra Credit Alert**

Plasma donation is something more and more people are doing these days to provide a vital medical service. Research how plasma donation is done and what it is used for and briefly explain your new knowledge below: