

Project Heart

Activities for the Classroom

EXPERIMENT

I SEE RBCs!

Introduction

Blood is actually a tissue. It is thick because it is made up of a variety of cells, each having a different job. In fact, blood is actually about 80% water and 20% solid. Blood is made mostly of plasma. But there are 3 main types of blood cells that circulate with the plasma: platelets, red blood cells, and white blood cells.

Red blood cells (RBCs) carry oxygen. Of the 3 types of blood cells, RBCs are the most plentiful. In fact, a healthy adult has about 35 trillion of them. The body creates these cells at a rate of about 2.4 million a second, and they each have a life span of about 120 days.

Red blood cells are tiny. Human hair has a diameter of 1/20 mm or 50 microns. RBCs average about 7 microns. Usually you need a microscope to see RBCs, but, under the right lighting conditions, sometimes you can see shadows of them floating in your eyes. These “floaters” are diffraction patterns of chains of cells in your eye, most of which are red blood cells and fibers. The following is a set of easy steps to help you view your very own RBCs.

Materials

1. Aluminum foil
2. Needle

3. Lamp with 60-100 watt light bulb
4. White wall

Directions

1. Cut an 8 1/2 x 11 inch rectangle of aluminum foil.
2. With the needle, carefully poke one tiny hole in the center of the aluminum sheet.
3. Place your lamp so it casts light on the white wall.
4. Look through the pinhole two feet from your lightsource (lamp with light bulb). After a few seconds you should be able to see a “floater” which looks like a blob or line of shadows drifting slowly across your eye.
*Do not stare at the light for more than 30 seconds at a time.

Deep Exploration

1. You can manipulate the movement of the floaters by moving your eyes. Try blinking. Do they wipe away? If yes, the cells are on the surface of your eye. Now try rolling your eyes. Can you see the floaters turn and swirl?
2. Try varying the distance of the pinhole from your eye. Do the cells appear bigger or smaller? Why?

