Anatomy and Physiology Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
Mr. Akemann  
Mrs. Sutton

**Investigating Diffusion Through Living Membranes**Red blood cells carry Oxygen throughout the body. They do this using the protein hemoglobin. RBC’s have a unique shape that allows them to rapidly diffuse (release and take in) the Oxygen during respiration in the lungs. Draw the shape of a normal RBC:

You will be putting RBC’s in various solutions to see how the shape of the RBC’s changes and if osmosis occurs. Based on your observations you will then draw a particle picture showing the movement of materials in and out of the cell.  
  
To examine permeability properties of cell membranes, conduct the following:

**Slide One**

1. Place one drop of blood on a slide with a pipette.
2. Obtain the physiological saline solution and use the dropper to add one small drop to your blood sample. Gently mix the solution with a toothpick.
3. Add a coverslip at a 45o degree angle and immediately observe under the microscope.

Cell

How do the cells appear? Was there any change to their normal disc-like shape?

Define isotonic:

Draw a particle picture to the right showing the movement (if any) of water  
in/out of the cell.

**Slide Two**

1. Place one drop of blood on a slide with a pipette.
2. Obtain the 4% NaCl solution and use the dropper to add one small drop to your blood sample. Gently mix the solution with a toothpick.
3. Add a coverslip at a 45o degree angle and immediately observe under the microscope.

How do the cells appear? Was there any change to their normal disc-like shape?

Define hypertonic:

Define crenation:

Draw a particle picture showing the movement (if any) of water in/out of the cell.

**Slide Three**

1. Place one drop of blood on a slide with a pipette.
2. Obtain the distilled water and use the dropper to add one small drop to your blood sample. Gently mix the solution with a toothpick.
3. Add a coverslip at a 45o degree angle and immediately observe under the microscope.

How do the cells appear? Was there any change to their normal disc-like shape?

Define hypotonic:

Define hemolysis:

Draw a particle picture showing the movement (if any) of water in/out of the cell.

Rinse blood-soiled slips and coverslips and then place them into the bleach beaker. Dispose of the toothpicks. Wash your hands!

Obtain the three test tubes from your instructor with the blood solutions in them.

Hold each test tube in front of this page. Record the clarity of print on a white sheet of paper seen through the fluid in each tube.

Physiological Saline Solution:  
  
4% NaCl Solution:

Distilled Water Solution:

**APPLICATION**

Many children worldwide suffer from a deficiency of dietary protein. As a result, they have very low levels of blood albumin (a large protein carried in the blood stream). How would this affect the child’s overall blood volume and water content of their blood? Explain WHY. (Hint: start by drawing a particle picture)