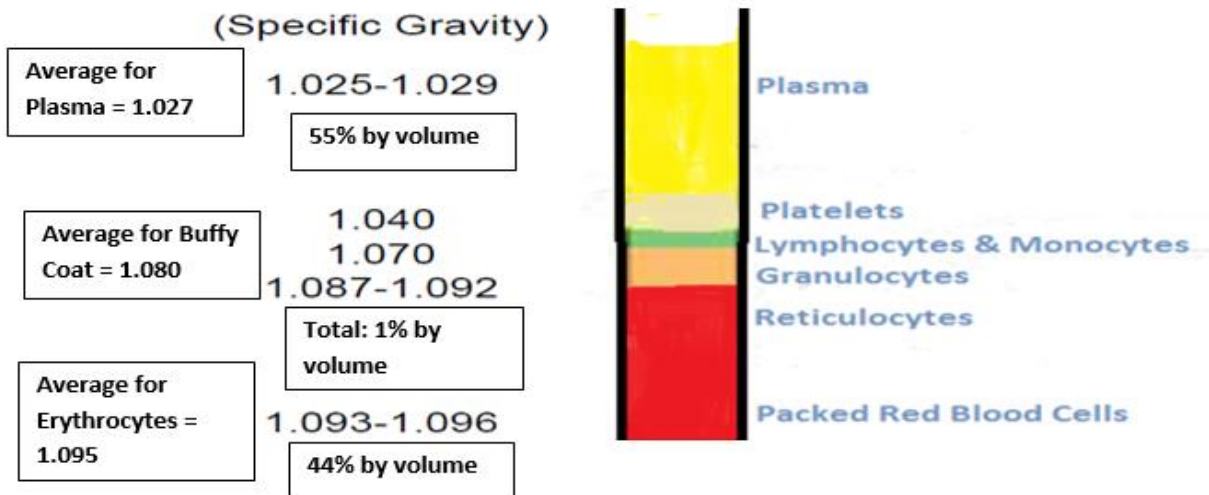


## Student Lab Handout

### Recall the simulation protocol we decided on:

- Fibrous tomato (V8 drink) = Erythrocytes
- Olive oil = Plasma
- Butter = Globulins
- Petroleum jelly = Fibrinogen
- Beet extract containing salt = Reduced protein concentration by increasing the electrolyte content
- Starch solution = White blood cells
- Beet shavings = Sickle cell

### For your reference:



**Figure 1.** Percent composition and specific gravity of separated layers of blood obtained by the centrifugation process. The average specific gravity of normal human blood is 1.060.

*Source:* Adapted with permission from Stec, Theresa C. "What is in the Bag?" Accessed December 2014. (34-slide PDF file; an overview of blood and blood products), page 19. [http://c.ymcdn.com/sites/www.apheresis.org/resource/collection/387FC8D3-D586-4DC2-A60D-EA1A83285A68/Fri\\_1515\\_2\\_ES\\_V\\_Stec\\_Seacliff\\_A\\_&\\_B\\_update.pdf](http://c.ymcdn.com/sites/www.apheresis.org/resource/collection/387FC8D3-D586-4DC2-A60D-EA1A83285A68/Fri_1515_2_ES_V_Stec_Seacliff_A_&_B_update.pdf)

### Lab Work

**Your Task:** Each team member makes one of the five sample blood models required. However, all group members note the composition for each sample blood model.

### **Sample Blood Model for Normal Blood**

In a graduated test tube with screw cap, mix 4.5 ml of V8 drink, 5.5 ml of olive oil containing 1% petroleum jelly.  
Shake the sample well.  
Let it stand for 60 minutes on a flat surface with no vibrations or disturbances nearby.  
At the 60<sup>th</sup> minute, note the height in cm of the clear liquid on the top of the sediment.

### **Sample Blood Model for High ESR-1: Rheumatoid Arthritis**

(Note: This ESR value should be higher than the ESR value for the normal sample blood model.)

In a graduated test tube with screw cap, mix 4.5 ml of V8 drink, 5.0 ml of olive oil containing 1% petroleum jelly and 0.5 ml of olive oil containing 0.5% butter.  
Shake the sample well.  
Let it stand for 60 minutes on a flat surface with no vibrations or disturbances nearby.  
At the 60<sup>th</sup> minute, note the height in cm of the clear liquid on the top of the sediment.

### **Sample Blood Model for High ESR-2: Anemia**

(Note: This ESR value should be higher than the High ESR-1.)

In a graduated test tube with screw cap, mix 3.0 ml of V8 drink, 6.0 ml of olive oil containing 1% petroleum jelly, and 1.0 ml of olive oil containing 1.0% butter.  
Shake the sample well.  
Let it stand for 60 minutes on a flat surface with no vibrations or disturbances nearby.  
At the 60<sup>th</sup> minute, note the height in cm of the clear liquid on the top of the sediment.

### **Sample Blood Model for Low ESR – 1: Leukocytosis**

(Note: This ESR value should be lower than the ESR value for the normal sample blood model.)

In a graduated test tube with screw cap, mix 4.0 ml V8 drink, 5.5 ml of olive oil containing 1% petroleum jelly, and 0.5 ml of 5% starch solution.  
Shake the sample well.  
Let it stand for 60 minutes on a flat surface with no vibrations or disturbances nearby.  
At the 60<sup>th</sup> minute, note the height in cm of the clear liquid on the top of the sediment.

### **Sample Blood Model for Low ESR – 2: Sickle-Cell Anemia**

(Note: This ESR value should be lower than the ESR value for the normal sample blood model.)

In a graduated test tube with screw cap, take 2.0 ml V8 drink, 2.0 ml beet extract; using very small tweezers, add a very small amount of beet shaving, shake well and add 5.5 ml of olive oil containing 1% petroleum jelly.  
Shake the sample well.  
Let it stand for 60 minutes on a flat surface with no vibrations or disturbances nearby.  
At the 60<sup>th</sup> minute, note the height in cm of the clear liquid on the top of the sediment.

## Data Collection

At the 60<sup>th</sup> minute, record below the ESR test values of the sample blood models.

#	Blood Model Composition	ESR Value (mm/hr)
1		
2		
3		
4		
5		

## Analyze and Summarize Findings

From the ESR values, predict which sample blood model closely corresponds to the blood characteristics of which disease.

#	Blood Model Composition	Probable Disease Condition
1		
2		
3		
4		
5		