
Pre-lab Quiz Results
You scored 100% by answering 4 out of 4 questions correctly.

1. Hematocrit
You correctly answered: b. of 40 means that 40% of the volume of blood consists of RBCs.

2. A buffy coat layer
You correctly answered: d. is all of the above.

3. The diagnosis of anemia indicates
You correctly answered: a. a lower-than-normal hematocrit.

4. Polycythemia refers to
You correctly answered: c. a significant increase in RBCs.
Experiment Results

Predict Question: Predict how the hematocrits of the patients living in Denver, Colorado (approximately one mile above sea level), will compare with the hematocrit levels of the patients living in Boston, Massachusetts (at sea level).

Your answer: c. The hematocrits of the Denver residents will be higher than those of the Boston residents.

Stop & Think Questions:

Why would the hemoglobin levels of an anemic patient be lower than the hemoglobin levels of a normal, healthy individual?

You correctly answered: c. Because hemoglobin resides in RBCs, you would anticipate a low hematocrit level to coincide with a low hemoglobin level.

Experiment Data:

<table>
<thead>
<tr>
<th>Blood sample</th>
<th>Height of column of blood</th>
<th>Height of red blood cell layer</th>
<th>Height of buffy coat (white blood cells)</th>
<th>Hematocrit</th>
<th>% WBC</th>
</tr>
</thead>
<tbody>
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<td>48 mm</td>
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<td>32 mm</td>
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</tbody>
</table>

Sample 1: healthy male living in Boston
Sample 2: healthy female living in Boston
Sample 3: healthy male living in Denver
Sample 4: healthy female living in Denver
Sample 5: male with aplastic anemia
Sample 6: female with iron-deficiency anemia
Post-lab Quiz Results
You scored 100% by answering 4 out of 4 questions correctly.

1. Anemia refers to
You correctly answered: c. a lower-than-normal hematocrit.

2. To complete the blood test to measure hematocrit, you must seal the blood-containing capillary tubes on one end with a clay material so that
You correctly answered: d. the blood sample can be centrifuged without having the blood spray out of the tube.

3. Possible causes of polycythemia include
You correctly answered: b. living at high altitudes.

4. You would expect anemia to develop in a person
You correctly answered: c. who has abnormally shaped hemoglobin in their RBCs.
Review Sheet Results

1. List the hematocrits for the healthy male (sample 1) and female (sample 2) living in Boston (at sea level) and indicate whether they are normal or whether they indicate anemia or polycythemia.
   Your answer:
   Healthy male: hematocrit 48.
   Healthy female: hematocrit: 44.
   The reference values for hematocrit in males are 42-52 and in females 37-47. This means these two patients are healthy and does not suffer from either anemia (too low) or polycythemia (too high).

2. Describe the difference between the hematocrits for the male and female living in Boston. Why does this difference between the sexes exist?
   Your answer:
   The difference in hematocrit is caused by the fact that males have a larger blood volume and body mass than women. This gives men higher level on hematocrit.

3. List the hematocrits for the healthy male and female living in Denver (approximately one mile above sea level) and indicate whether they are normal or whether they indicate anemia or polycythemia.
   Your answer:
   Male Denver: 55
   Female Denver: 53
   According to the reference ranges (men 42-52) and women (37-47) polycythemia is indicated in both cases.

4. How did the hematocrit levels of the Denver residents differ from those of the Boston residents? Why? How well did the results compare with your prediction?
   Your answer:
   The hematocrit values of the two living in Boston was lower than the ones living in Denver. This is caused by the difference in sea level. The higher level above sea, the higher level of hematocrit. This was like my prediction.

5. Describe how the kidneys respond to a chronic decrease in oxygen and what effect this has on hematocrit levels.
   Your answer:
   When there is a decrease in oxygen level, the kidneys will try to use as little oxygen as possible, which will lead to a decrease in hematocrit.

6. List the hematocrit for the male with aplastic anemia (sample 5) and indicate whether it is normal or abnormal. Explain your response.
   Your answer:
   Male with aplastic anemia = hematocrit 19.
   The male presents with a very low hematocrit level, because the normal ranges for men are 42-52. This indicates why patient is diagnosed with aplastic anemia.

7. List the hematocrit for the female with iron-deficiency anemia (sample 6) and indicate whether it is normal or abnormal. Explain your response.
   Your answer:
   Female with iron deficiency anemia: 32.
   The value of hematocrit is below the normal range for women (37-47) and this shows why the female is diagnosed with iron-deficiency anemia.