Blood Vessels

1. Fill in the following chart:

<table>
<thead>
<tr>
<th>Direction they carry blood</th>
<th>Arteries</th>
<th>Veins</th>
<th>Capillaries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small vessels are called</td>
<td>arterioles</td>
<td>venules</td>
<td>------------</td>
</tr>
<tr>
<td>Blood Pressure</td>
<td>HIGH</td>
<td>LOW</td>
<td>MED.</td>
</tr>
<tr>
<td>Wall structure</td>
<td>3 layers and very thick</td>
<td>3 layers but thinner</td>
<td>one cell layer thick</td>
</tr>
<tr>
<td>Special Feature</td>
<td>elastality</td>
<td>one-way valves</td>
<td>gas exchange</td>
</tr>
<tr>
<td>Example</td>
<td>may vary - aorta</td>
<td>may vary - vena cava</td>
<td>vessels in skin etc</td>
</tr>
</tbody>
</table>

2. Fill in the blanks
   a. **Vena cava** is the largest vein in the body that takes blood from all of the body and returns it to the **RIGHT** atrium of the heart.
   b. **ARTERIES** carry blood away from the aorta to the arterioles.
   c. **VEINS** carry blood back toward the heart; rely on muscle contractions to provide pressure to move the blood.
   d. **Arterioles** are no thicker than human hair and carry blood away from arteries into the capillaries.
   e. **Venules** carry blood back to the veins after exchanges have occurred in the capillaries.
   f. **Aorta** is the largest artery in the body.
   g. **Capillaries** are tiny connecting bridges between arterioles and venules. There are tiny muscles that control the flow of blood into these vessels called **Sphincters**.
   h. Capillaries are composed of a single layer of cells that are responsible for exchanging **CO₂** and **O₂**. [5 each]
   i. The **pulmonary vein** sends oxygenated blood back to the heart from the lungs. It is part of the **pulmonary circulation**.
Blood
1. What are the 3 main functions of blood for our body?
   1) transport O₂ & nutrients
   2) heat
   3) transport waste to be cleared out.

2. What are the 4 components of blood?
   1) plasma
   2) RBC
   3) WBC
   4) platelets

3. Fill in the blank with the appropriate component
   a) Look like red discs, no nucleus, similar in size
      RBC
   b) Small granular fragments, no nucleus, vary in size
      platelets
   c) Large in size, well formed nucleus
      WBC
   d) Straw-colored fluid
      Plate plasma

4. Complete the statement or answer the question.
   a) Where are red blood cells (RBC’s) made?
      bone marrow
   b) Hemoglobin gives RBC’s the ability to
      carry O₂
   c) What organ removes dead RBC’s?
      spleen
   d) What is the RBC’s job in transportation?
      carry O₂
   e) What does a white blood cell do?
      fight infections
   f) Plasma is composed of 55% plasma and 45% red blood cells.

5. Name the white blood cells discussed in class and describe their function.
   - lymphocyte: part of acquired immune response
   - leukocytes: (including macrophages) - engulf + digest pathogens (general response)
   - neutrophils: part of acquired immune response

6. What do platelets do and how do they do it?
   - responsible for blood clotting. Fix fragments of larger blood cells.
7. True or False?
   a) White blood cells only travel in the blood stream and never travel inside the body.  \( \text{F} \)
   b) Missing certain proteins does not affect the blood's clotting ability.  \( \text{F} \)
   c) All 4 parts of the blood work together at the same time.  \( \text{T} \)

The Heart
1. a. Label the heart diagram below (be specific).

![Heart Diagram]

b. Trace the flow of a red blood cell as it returns from the body and travels through the structures in the heart diagram, and finally back to the body. (List ALL the structures it passes, valves too!)

\[ \text{Vena cava (sup + inf.)} \rightarrow \text{R.A.} \rightarrow \text{Tri. Valv.} \rightarrow \text{L.A.} \rightarrow \text{Pulmonary valve} \rightarrow \text{Pulmonary artery} \rightarrow \text{LUNGS} \rightarrow \text{Pulm. v.} \rightarrow \text{L.A.} \rightarrow \text{Bicuspid V.} \rightarrow \text{L.V.} \rightarrow \text{Aortic V.} \rightarrow \text{Aorta} \rightarrow \text{Body} \]

2. Answer the following questions.
a. Which structure separates the right side of the heart from the left side? Why is it necessary to separate the two sides?

Septum - separate deoxygenated + oxygenated blood.

b. Which structure stops the backflow of blood into the left ventricle? Why is this important?

Aortic valve - maintain blood flow to body, weak valve puts pressure on (restricts blood flow out)

c. Which chamber pumps oxygenated blood out of the heart?

Left ventricle

3. Fill in the names of the structures involved in the regulation of the heart beat:

SA node → atria (contract) → AV node → Purkinje fibres → ventricles (contract)

4. Modified True or False

Please correct any false statements to make them true.

a. T Generally arteries have thicker walls than veins

b. F Semilunar valves are located between the atriums and the ventricles

c. F Veins are vessels that conduct blood from the heart, towards the body

d. F The lub-dub sound of the heart is due to the contraction of the right side and then the left side.