Learning Goals:
1. I will be able to describe the internal functioning of the heart (blood, electrical, fetal)
2. I will be able to draw and explain the vessel structures and functions
3. I will be able to explain the components of the blood and blood proteins
4. I will be able to explain the lymphatic system

Learning Goal #1: I will be able to describe the internal functioning of the heart (both the blood movement and the electrical conduction)

1. The pulmonary artery carries blood away from the
   a. left atrium
   b. right atrium.
   c. left ventricle.
   d. right ventricle.

2. Name the labeled structures in the diagram below and describe their functions.
   X= ______________________________
   Z= ______________________________
   T= ______________________________
   U= ______________________________

3. Which of the following represents the path of a red blood cell as it leaves the left ventricle, flows through the kidneys, and returns to the right atrium?
   a. aorta, renal vein, vena cava, renal artery.
   b. Aorta, renal vein, renal artery, vena cava
   c. Aorta, renal artery, vena cava, renal vein.
   d. Aorta, renal artery, renal vein, vena cava.

4. The contraction of cardiac muscle is initiated in the
   a. sinoatrial node.
   b. Purkinje fibers.
   c. chordae tendinea
   d. atrioventricular node.
   e. the ventricle

5. Select the correct sequence of structures involved in the complete heartbeat.
   a. AV node, Purkinje fibers, SA node.
   b. SA node, Purkinje fibers, AV node.
   c. AV node, SA node, Purkinje fibers.
   d. SA node, AV node, Purkinje fibers
6. In which chamber of the heart are the nodes located?
   a. Septum
   b. Right atrium.
   c. Left ventricle.
   d. Right ventricle.

   B

7. Why does the fetal heart have bypasses? What are the purposes?
   - to keep blood pressure high enough to get around the body
   - ductus venosus => bypass liver
   - foramen ovale/ductus arteriosus => bypass lungs

8. What are four adaptations in the fetal circulatory system that helps supply the fetus’s cells with oxygenated blood?
   a. Foramen ovale (hole between r. at -> l. at)
   b. Ductus arteriosus (aorta)
   c. Ductus venosus (liver)
   d. Umbilical cord (1 vein + 2 arteries)

9. Why is it important that a pregnant mother only eats healthy foods?
   - fetal liver doesn’t work, blood is bypassed as the liver is made of thousands of capillaries & it would be pressure too much
   - therefore fetus has no detoxification abilities

Learning Goal #2: I can draw and explain the vessel structures and functions

1. Blood pressure will be at its highest when:
   a. atria relax.
   b. atria contract.
   c. ventricles relax.
   d. ventricles contract.

   D

2. If blood pressure is recorded as 100/60, the 100 figure represents the pressure on the artery wall when the
   a. left atrium has contracted.
   b. left ventricle has contracted.
   c. diameter of the artery is at its minimum.
   d. atrial and ventricular pressure are equal.

   B

3. What does this mean? Why?
   - the sphygmomanometer reads the patients blood pressure
   - too high bl. pr is called hypertension.
   - this could mean the arteries are under too much pressure due to plaque or stenosis (narrowing) or too much blood volume.

"In this case, a new high score is not a good thing."
4. Which of the following best describes a vein?
   a. Thin-walled, elastic  
   b. Thick-walled, elastic  
   c. Thick-walled, elastic and supplied with valves.  
   d. Thin-walled, and supplied with valves  

   ![Red circle and D]

5. List the 5 different vessel types and one characteristic about each (5)

<table>
<thead>
<tr>
<th>Vessel Name</th>
<th>Fact or characteristic about vessel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artery</td>
<td>circular lumen, thick wall, elastic</td>
</tr>
<tr>
<td>Arteriole</td>
<td>small artery</td>
</tr>
<tr>
<td>Capillary</td>
<td>site of gas exchange</td>
</tr>
<tr>
<td>Venule</td>
<td>thin walled, valve, oxygen blood</td>
</tr>
<tr>
<td>Vein</td>
<td>vessel, oval lumen</td>
</tr>
</tbody>
</table>

6. **DOCTOR FUN**

   Where are the major blood vessels?
   - dorsal aorta (oxygenated blood)
   - inferior vena cava (deoxygenated blood)
   - Dig: mesenteric, hepatic portal, hepatic; legs: iliac, femoral
   - Kidney: renal
   - Lung: pulmonary
   - Head: carotid, jugular

   "For the last time - there's no major blood vessel in the buttocks!"

**Learning Goal #3: I will be able to explain the components of the blood and blood proteins**

1. 55% of a hemocrit is:
   a. Red blood cells  
   b. White blood cells  
   c. Plasma  
   d. platelets  

   ![Red circle and C]

2. White blood cells are responsible for:
   a. blood clotting.  
   b. fighting infection.  
   c. transporting oxygen.  
   d. transporting nutrients.  

   ![Red circle and B]

3. Which one of the following is a protein used in blood clotting?
   a. Urea.  
   b. Glucose.  
   c. Glycerol.  
   d. Fibrinogen.  

   ![Red circle and D]
4. In the plasma, 90% is _________________
   a. Proteins  
   b. Water  
   c. Platelets  
   d. Fiber

5. A person who is B positive will have
   a. antibody A, antibody B, and antibody Rh.  
   b. Antibody A only  
   c. Antibody A, and antibody Rh.  
   d. no antibodies.

6. What are the 4 blood types, and which is the universal donor (label UD) and which is the universal recipient (label UR)?
   a. A +  
   b. AB -  
   c. O -  
   d. B +

7. Would a person with blood type A+ be able to accept blood that is B-? Back up your answer
   No, because they will make antibodies to anything they haven't seen before. Agglutination will lead to hemolysis which can lead to death.

Lymphatic System:

1. Structures
   - lymph vessels - carry lymph  
   - lymph nodes - where lymph tested and stored by immune system  
   - spleen - monitors RBC  
   - thymus - makes T cell for immune system

2. Swollen lymph nodes are enlarged lymph nodes. Means you are fighting an infection.