BE SURE TO CAREFULLY READ THE INTRODUCTION PRIOR TO ANSWERING THE QUESTIONS!!!

You will need to refer to your text book to answer some of the questions on this worksheet.

EXERCISE 23.1: Glands and Respiratory Structures of the Neck and Thoracic Cavity

Procedure
1. Examine the fetal pig and identify the following structures: sternum, thymus gland, larynx, trachea, glottis, thyroid gland and esophagus. Describe the functions of the organs on the table below.

<table>
<thead>
<tr>
<th>Structure</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thymus gland</td>
<td></td>
</tr>
<tr>
<td>Larynx</td>
<td></td>
</tr>
<tr>
<td>Thyroid gland</td>
<td></td>
</tr>
<tr>
<td>Trachea</td>
<td></td>
</tr>
<tr>
<td>Esophagus</td>
<td></td>
</tr>
</tbody>
</table>

EXERCISE 23.2: The Heart and the Pulmonary Blood Circuit

Procedure
1. Examine the fetal pig and identify the following structures:

- Membranes and cavities: pericardium, pericardial cavity, pleural cavity
- Chambers of the heart: right and left atria, right and left ventricle
- Pulmonary circuit: right ventricle > pulmonary trunk > pulmonary arteries (ductus arteriosus) > lungs > pulmonary veins > left ventricle

2. Examine the dissected sheep heart with your instructor and identify the following structures:

- Chambers of the heart: right and left atria, right and left ventricle
- Heart valves: right and left AV valves
Results

Label all of the structures on the picture of the heart below:

1. __________________________________
2. __________________________________
3. __________________________________
4. __________________________________
5. __________________________________
6. __________________________________
7. __________________________________
8. __________________________________
9. __________________________________
10. __________________________________
11. __________________________________
12. __________________________________
13. __________________________________
14. __________________________________
15. __________________________________
Fill in the blanks in the paragraph below regarding the **pulmonary circuit**:

Blood entering the heart passes first into the right __________________(chamber). From there it flows through the right _____________________ (valve) into the right __________________ (chamber).

When the chambers of the heart contracts, this blood is forced out of the heart into the ___________________ (vessel) where it divides into the _________________ (vessels) on to the _________________ (organ). The blood then returns to the heart via the _________________ (vessels) and enters the _________________ (chamber) of the heart. By this time, the blood has become oxygenated.

**Discussion**

1. What is the difference between an **artery** and a **vein**?

2. Why would the pulmonary arteries in a **fetus** be relatively small compared to an adult?

3. Although a pulmonary circuit exists in the heart of amphibians and most reptiles, it only has three chambers: two atria and one ventricle receives blood from both atria (see figure below). What is the **disadvantage** of this type of circulatory system?
EXERCISE 23.3: The Heart and the Systemic Circuit in the Thorax

Procedure
1. Use Figures 23.4 and 23.5 in your lab manual for reference. Examine the fetal pig and identify the following structures:

- brachiocephalic veins
- internal and external jugular veins
- subclavian vein
- axillary vein
- cephalic vein
- aortic arch
- brachiocephalic trunk
- left and right subclavian arteries
- common carotid arteries
- subscapular arteries
- axillary arteries

EXERCISE 23.4: The Systemic Circuit in the Abdominal Cavity

Lab Study A – Major Branches of the Dorsal Aorta and the Caudal Vena Cava

Procedure
1. Use Figures 23.6 and 23.8 in your lab manual for reference. Examine the fetal pig and identify the following structures:

- celiac artery
- cranial mesenteric artery
- mesenteric arteries and veins
- renal arteries and veins
- external iliac arteries and veins
- common iliac arteries and veins
- femoral artery
- hepatic veins

Lab Study B – The Hepatic Portal System**

Procedure
1. Use Figure 23.6 and especially Figure 23.8 in your lab manual for reference. Examine the fetal pig and identify the following structures of the hepatic portal system***:

- mesenteric arteries and veins
- lienogastric vein
- hepatic PORTAL vein
- umbilical veins

Results
Review the blood vessels and organs in the pathway of blood through the hepatic PORTAL system. Fill in the blanks in the following paragraph (see Figure 23.8!!):

Blood that is poor in nutrients is carried from the aorta to the intestines via the ________________ arteries. It is here that absorbed nutrients enter the blood. This nutrient rich blood flows into the ________________ vein, which joins the ________________ vein from the stomach and the spleen to become the ________________ vein. This vein now carries blood to the liver where the sorting of nutrients occurs. Finally, the blood returns to the aorta via the ________________ vein.

EXERCISE 23.5: Circulation – Fetal and Adult Structures

The circulatory system of a fetus has structures that change after birth. Use the internet to determine how these fetal structures change after birth and describe their functions before and after birth.
<table>
<thead>
<tr>
<th>Fetal Structure</th>
<th>Post-birth fate</th>
<th>Function before and after</th>
</tr>
</thead>
<tbody>
<tr>
<td>umbilical vein</td>
<td>round ligament of the liver</td>
<td></td>
</tr>
<tr>
<td>ductus arteriosus</td>
<td>Ligamentum arteriosum</td>
<td></td>
</tr>
<tr>
<td>ductus venosus</td>
<td>Ligamentum venosum</td>
<td></td>
</tr>
<tr>
<td>foramen ovale</td>
<td>Fossa ovalis</td>
<td></td>
</tr>
</tbody>
</table>

**Discussion**

1. What would happen to the newborn child if the changes to the ductus arteriosus and the foramen ovale did not take place?

**EXERCISE 23.6: Circulation – Details of the Respiratory System**

**Procedure**

1. Use Figure 23.9 in your lab manual for reference. Examine the fetal pig and identify the following structures:

   - larynx
   - trachea
   - bronchus
   - bronchioles
   - lungs

**Discussion**

1. In terrestrial vertebrates, what is the advantage of having the surfaces for oxygen and carbon dioxide exchange embedded deep in the lung tissue?

2. What blood vessel supplies the blood from the heart to the lungs?

3. What blood vessels carry the blood from the lungs back to the heart?