Unit #3: Transportation and Respiration
“The Cardiovascular System”
Heart

• The central muscle of the Cardiovascular system

• It is responsible for “pumping” oxygen – poor (deoxygenated) blood to the Lungs and oxygen – rich (oxygenated) blood to the rest of the body

Blood

• The “fluid medium” of the cardiovascular system

• Considered a liquid connective tissue

• Responsible for transporting nutrients, dissolved gasses (oxygen, carbon dioxide, enzymes, hormones and waste products

• Involved in the regulation of pH, body temperature and electrolyte levels (ion levels)

• Protects the body from invaders and helps the body heal after an injury
Blood Vessels

1. Arteries

- The network of hollow tube like structures that connect the heart to the other organs of the body and carry blood through the body
- There are 3 types of blood vessels:
  - These vessels carry blood AWAY from the heart
  - Arteries have a thin inner layer of Epithelial Tissue and a thicker outer layer made of smooth muscle, elastic fibres and connective tissue
  - Tough and flexible and able to withstand high pressure
  - With the exception of the Pulmonary Arteries ALL arteries carry oxygen rich blood
2. Veins

• These vessels carry blood **TOWARDS** the heart

• Veins have a thin inner layer of epithelial tissue

• The outer layer of veins are made of connective tissue, smooth muscle and elastic fibres BUT they are thinner and less elastic than the walls of the arteries (diameter can’t expand like arteries)

• Veins are more flexible than arteries which reduces the resistance to the flow of blood through them

• Larger veins contain valves to prevent any backwards flow of blood
3. **Capillaries**

- These tiny blood vessels are made up of a one cell thick layer of epithelial cells.
- **In the capillaries is where the nutrient and gas exchange happens.**
- Capillary walls are thin enough that material can easily diffuse through them.

4. **Arterioles**

- Smaller muscular vessels that branch off of Arteries and distribute blood to the Capillaries.
| 5. Venules | • Small flexible blood vessels that collect blood from the capillaries and carries it into the Veins |
| Pulmonary Circulation | • Blood Circulation between the Heart and the Lungs |
| Systemic Circulation | • Blood Circulation between the Heart and the rest of the body |
Major Arteries:
(A) Aorta

- The largest artery in the body (2.5cm in diameter)
- Transports large volumes of oxygen-rich blood from the heart to other arteries in the body

(B) Brachiocephalic Trunk

- An “arch” where the Aorta branches into the Carotid Arteries
<table>
<thead>
<tr>
<th>(C) Carotid Arteries</th>
<th>- Supplies blood to the <strong>Neck and Head</strong></th>
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<tbody>
<tr>
<td>(D) Vertebral Arteries</td>
<td>- Supplies blood to the <strong>Spinal Cord</strong></td>
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<tr>
<td>For the Arms:</td>
<td>- The Subclavian (E), Axillary (F), Brachial (G), Radial (H) and Ulnar (I) supply blood to <strong>the arms</strong></td>
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</table>
(J) Coronary Arteries
- Supplies blood to the heart

(K) Celiac Trunk
- The Abdominal Branch of the Aorta
- Many of the arteries feeding the digestive system are connected here

(L) Hepatic Artery
- Supplies blood to the Liver
(O) Renal Arteries

For the Digestive System

- Supplies blood to the Kidneys

- Gastric Artery (M) provides blood to the stomach

- Mesenteric Arteries (P and R) supplies blood to the large and small intestines

For the Legs:

- The Iliac Arteries (S and T) and the Femoral Arteries (U) supply blood to the legs
Principal Arteries of the Body

Diagram showing the major arteries of the body, including:
- Left Radial Artery
- Right Radial Artery
- Left Ulnar Artery
- Right Ulnar Artery
- Celiac Trunk
- Hepatic Artery
- Gastroduodenal Artery
- Splenic Artery