

Cat Respiratory and Circulatory Systems

Student Notes - Answer Key

Respiratory System

Functions:

- To **transfer oxygen** from the air to the blood
- To **remove carbon dioxide** from the blood
- Carry it **out of the body** into the air
- Aids in **regulating the body temperature**

Oxygen is vital to the body's maintenance. **Carbon dioxide** is a waste product of the maintenance process.

Parts of the respiratory system:

- **Nose**
- **Mouth**
- **Trachea**
- **Pharynx**
- **Epiglottis**
- **Lungs**
- **Bronchi**

The cat breathes in air through its nose and mouth. The nose and mouth join to form the **pharynx**. The trachea is a tube that extends from the **pharynx to the lungs**. The **epiglottis** covers the trachea when swallowing occurs to prevent food and water from entering the lungs. At the lungs, the **trachea** branches into smaller tubes called bronchi or **bronchial tubes**. The bronchi divide into smaller and smaller **bronchioles** until they become dead end sacs called alveoli. It is in the **alveoli** where the actual exchange of oxygen and carbon dioxide occur.

Diaphragm

All mammals have a muscle that separates the respiratory system (lungs) from the rest of the internal organs. This muscle is called the **diaphragm**. The diaphragm works with the muscles between the ribs called "**intercostals**" to produce inspiration (or breathing in). **Exhalation** (or breathing out) is muscle relaxation, causing the air to move out of the lungs and body.

Circulatory System

The circulatory system consists

- Heart
- Blood
- Blood vessels
- Lymphatic system
- Spleen

Functions are to:

- Deliver oxygen and nutrients to the cells of the body
- To remove waste products.

Heart

- Has four chambers with four valves and contracts in a specific squeezing pattern
- This squeezing action pumps blood through the heart out to the lungs and body
- At a resting pulse of 120 beats per minute, a cat's heart will beat 63 million beats in a year
- It is the closure of the heart valves that gives the "lub dub" heart sounds

Blood Vessels

The blood vessels include:

- Arteries - vessels that carry blood away from the heart
- Vein - carry blood back to the heart
- Capillaries - tiny vessels where the arteries end and the veins begin

The largest artery is called the aorta. It carries freshly oxygenated blood to the body. Capillaries are only large enough for one blood cell to pass through at a time. It is in the capillaries where nutrients, oxygen and waste products are exchanged with individual body cells. Most live healthy cells in the body are in contact with a capillary. The largest veins are called the cranial and caudal vena cava. They carry the oxygen-depleted blood back to the heart. The heart then pumps that blood to the lungs via the pulmonary artery. Following oxygenation in the lungs the blood is carried back to the heart through the pulmonary vein and the cycle begins again.

Blood

- Blood is composed of cells suspended in a special fluid called plasma
- Majority of the cells in the blood are red blood cells
- Red blood cells contain hemoglobin, which functions by carrying oxygen and carbon dioxide and gives blood its characteristic red color
- Blood also carries white blood cells, to fight infection or invasion by anything foreign
- Blood also includes platelets, small cells that help in blood clotting

Lymphatic System

The lymphatic system helps to return to the heart the **fluid** that has leaked out of **blood vessels**. Lymph **vessels** are the tubes that carry lymph fluid and lymph **nodes** are the filters for lymph fluid. Lymph **nodes** also make some white blood cells. Lymph fluid is not pumped by the heart. Instead, it moves by **muscular** and **intestinal** activity.

Spleen

Long narrow purplish organ situated behind the stomach

Functions to:

- **Filter** blood
- **Destroy** old red blood cells
- **Store** red blood cells
- **Produce** certain kinds of white blood cells