

## Summary Outline: Circulatory and Respiratory Systems

### 1. Circulatory System

#### Main Components:

##### *1. Blood:*

- Transports oxygen, nutrients, and waste.
- Components:
  - Red blood cells: Transport oxygen and give blood its red color.
  - White blood cells: Protect against infections.
  - Platelets: Form clots to stop bleeding.

##### *2. Blood Vessels:*

- Arteries: Carry oxygenated blood from the heart to the body.
- Veins: Return blood to the heart.
- Capillaries: Connect arteries and veins; enable substance exchange.

##### *3. Heart:*

- Muscular organ that pumps blood.
- Divided into:
  - Left and right atria.
  - Left and right ventricles.
- Functioning:
  - Contraction: Pumps blood into arteries.
  - Relaxation: Receives blood from veins.

#### How the Circulatory System Works:

1. Deoxygenated blood enters the right atrium from the vena cava.
2. It passes to the right ventricle and is pumped to the lungs through the pulmonary arteries.
3. In the lungs, blood gets oxygenated and returns to the heart via the pulmonary veins.
4. The left atrium receives oxygenated blood, which passes to the left ventricle.

5. The left ventricle pumps the blood to the body through the aorta.

## 2. Respiratory System

### Main Components:

#### 1. Involved Organs:

- Nose, pharynx, larynx, trachea, bronchi, lungs, and diaphragm.

#### 2. Lungs:

- Right lung: Three lobes.
- Left lung: Two lobes.
- Contain bronchioles and alveoli (site of oxygen and carbon dioxide exchange).

### Breathing Process:

#### 1. Breathing Movements:

- Inhalation: Air enters; diaphragm contracts.
- Exhalation: Air exits; diaphragm relaxes.

2. Oxygen moves from the alveoli into the blood, while carbon dioxide moves from the blood to the alveoli for exhalation.

### How the Respiratory System Works:

1. Air enters through the nose or mouth, passing through the pharynx, larynx, and trachea.

2. The trachea divides into bronchi, which lead air into the lungs.

3. Inside the lungs:

- The bronchi divide into bronchioles, ending in alveoli.
- The alveoli perform gas exchange.

4. Oxygenated blood is transported to the heart and distributed throughout the body.

### Respiratory System Protection:

- Nasal cilia: Filter large particles.
- Mucus in the trachea and bronchi: Traps dust and bacteria.
- Ciliary motion: Keeps airways clean.

### Common Issues:

- Pollution and harmful substances (e.g., smoke) can impair lung function.
- Diseases like emphysema reduce lung elasticity and make breathing difficult.



