

BODY SYSTEMS

CHAPTER 3

THE CIRCULATORY SYSTEM

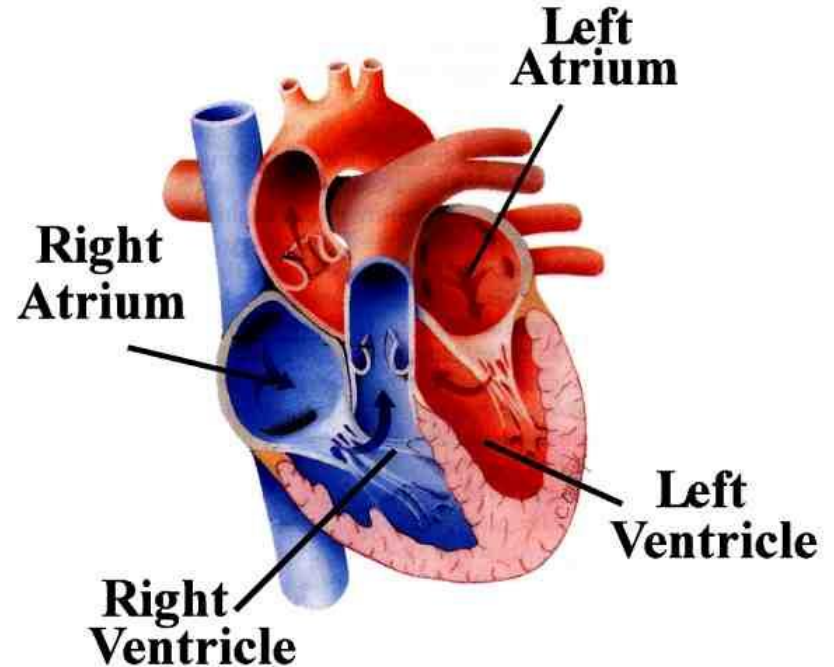
CHAPTER 3, LESSON 1

FUNCTION

- The human circulatory system consists of the heart, blood vessels, and the blood
- The circulatory system's function is to circulate the blood so that oxygen and nutrients can get to the body tissues, and waste products can be transported to their proper places

THE HEART

- The heart is a muscle that acts as a pump for the blood
 - When the heart contracts blood is forced out, and when it relaxes, blood enters
- Separated into 4 chambers
 - Left and Right Atria – Top portions; blood enters
 - Left and Right Ventricles – Bottom two portions; blood is pumped out



BLOOD VESSELS

- Arteries:
 - Carry blood away from the heart
 - Carry oxygenated blood
- Veins:
 - Carry blood to the heart
 - Carry de-oxygenated blood
- Capillaries:
 - Smallest blood vessels
 - Diffusion of oxygen, carbon dioxide and waste products occur here
 - One cell thick



BLOOD

- Blood Plasma
 - The liquid part of the blood
- Red Blood Cells
 - Shaped like discs with a dimple on each side
 - Carry oxygen to the rest of the body



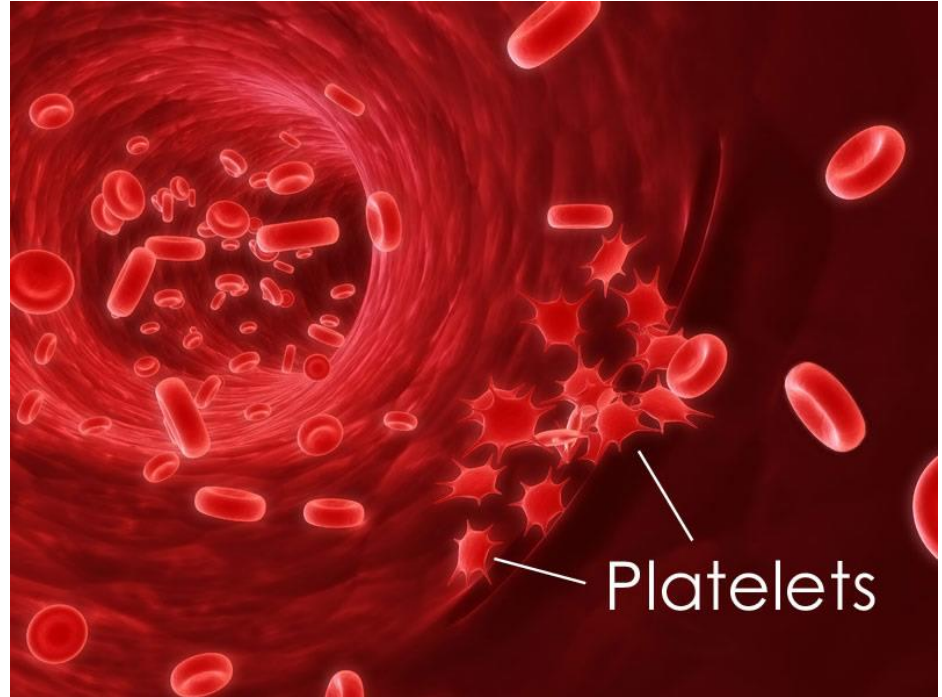
BLOOD

- White Blood Cells
 - Have many different shapes and sizes
 - Protect the body by eating germs such as viruses and bacteria



BLOOD

- Platelets
 - Not complete cells
 - Form blood clots



THE RESPIRATORY SYSTEM

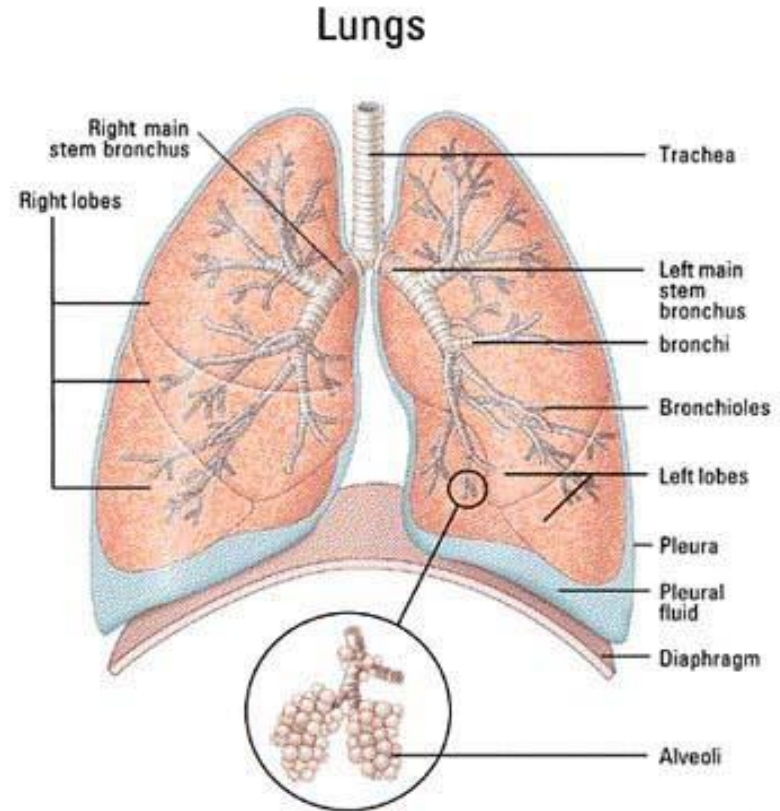
CHAPTER 3, LESSON 2

FUNCTION

- The function of the respiratory system is to exchange oxygen and carbon dioxide
- The respiratory system consists of the nose, pharynx, larynx, trachea, bronchi, and lungs

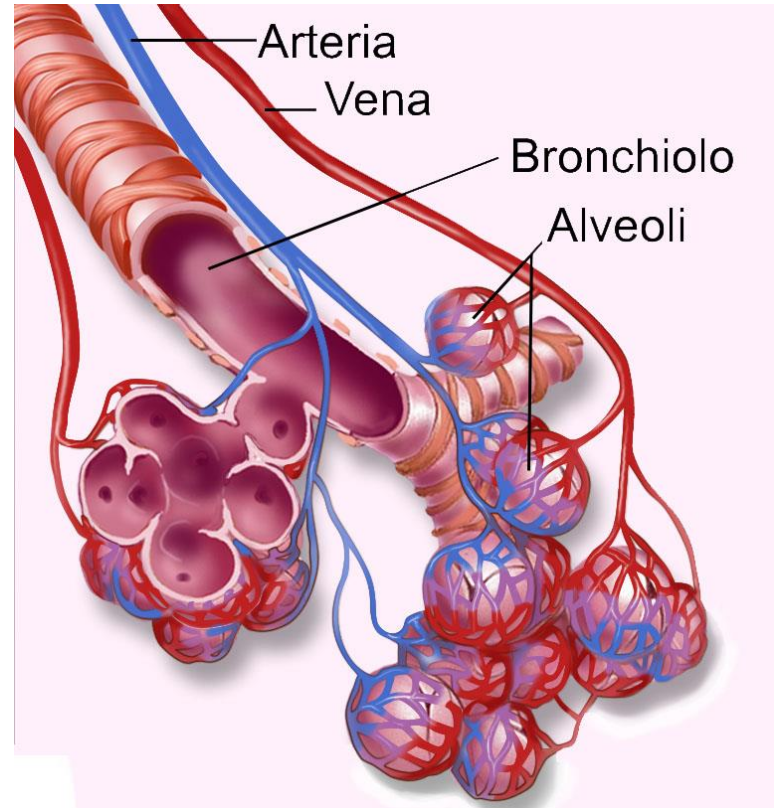
ANATOMY

- Trachea – Windpipe
- Bronchi – 2 main branches of the trachea
- Alveoli – Air sacs externally covered in capillaries; gas exchange occurs in the alveoli
- Diaphragm – Long flat muscle that separates the chest cavity from the abdominal cavity



GAS EXCHANGE

- There are approximately 350 million alveoli in each lung
- These alveoli cumulatively provide a very large surface area
- Oxygen dissolves in the moisture on the inner surface and diffuses into the blood in the pulmonary veins
- Carbon dioxide diffuses from the blood in the pulmonary arteries and into the alveoli



BREATHING

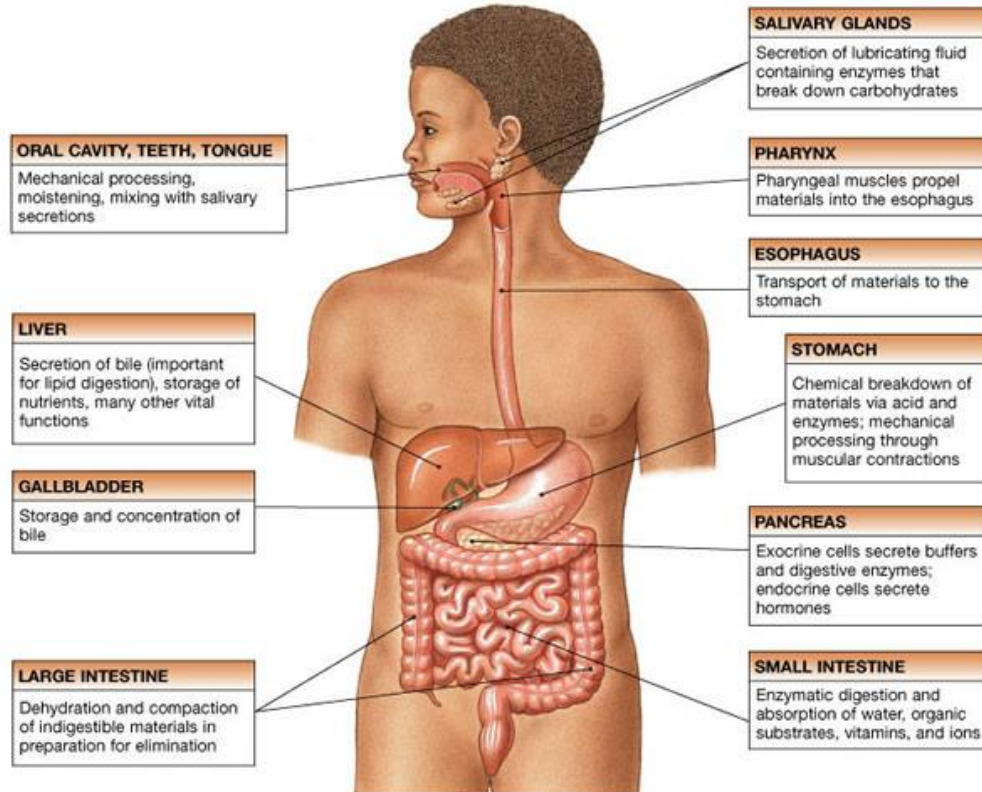
INHALING

- The diaphragm contracts, causing it to pull downward
- The rib cage rises
- Causes a partial vacuum in the lungs
- The partial vacuum allows air to enter the lungs

EXHALING

- The diaphragm relaxes, causing it to go upward
- The rib cage descends
- The relaxation of the diaphragm and rib cage descending force air out of the lungs

THE DIGESTIVE SYSTEM



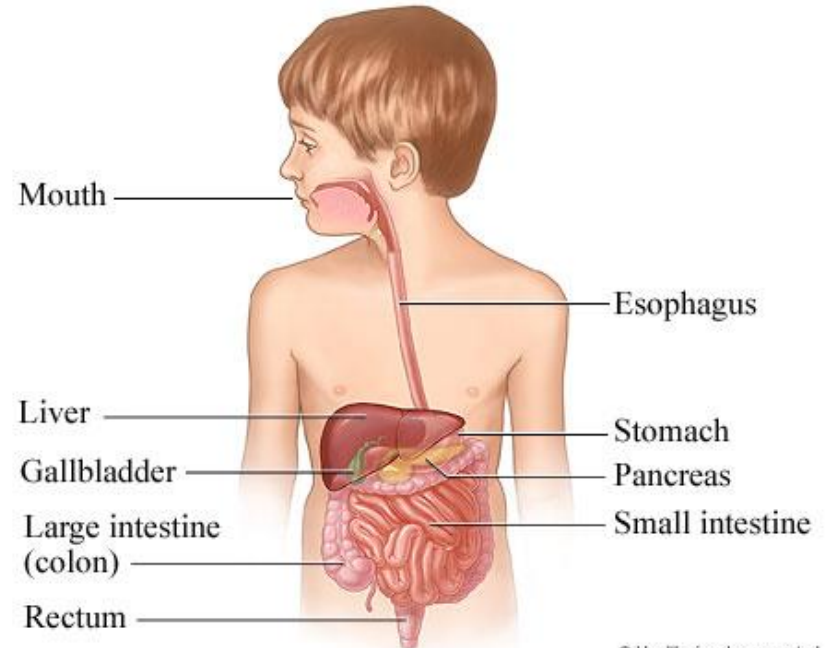
THE DIGESTIVE SYSTEM

- The function of each organ of the digestive system is to help convert foods into simpler molecules that can be absorbed and used by cells of the body

THE PROCESS OF DIGESTION

The Mouth

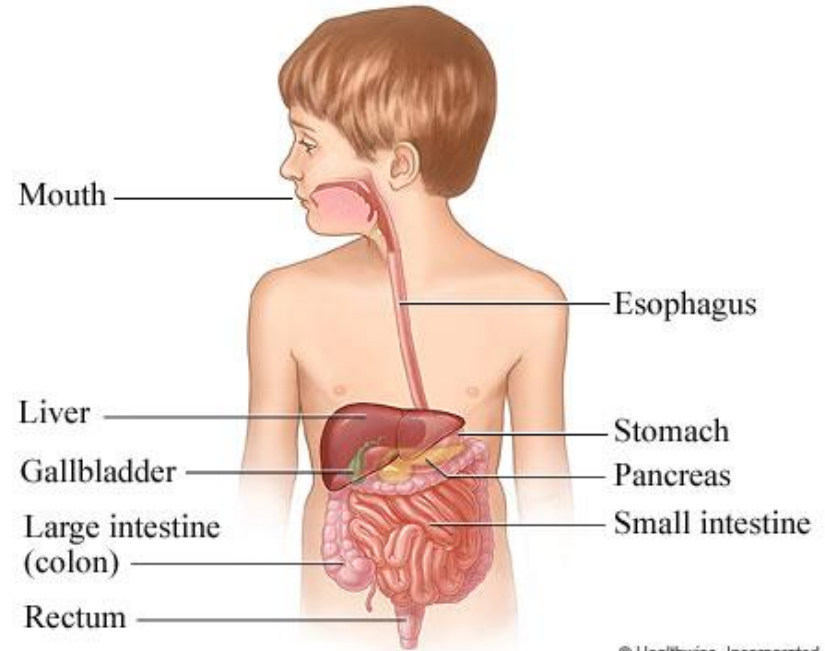
- Begins mechanical and chemical digestion
- Mechanical – Chewing food breaks it down to smaller pieces, increasing surface area
- Chemical – Saliva contains enzymes



THE PROCESS OF DIGESTION

Esophagus

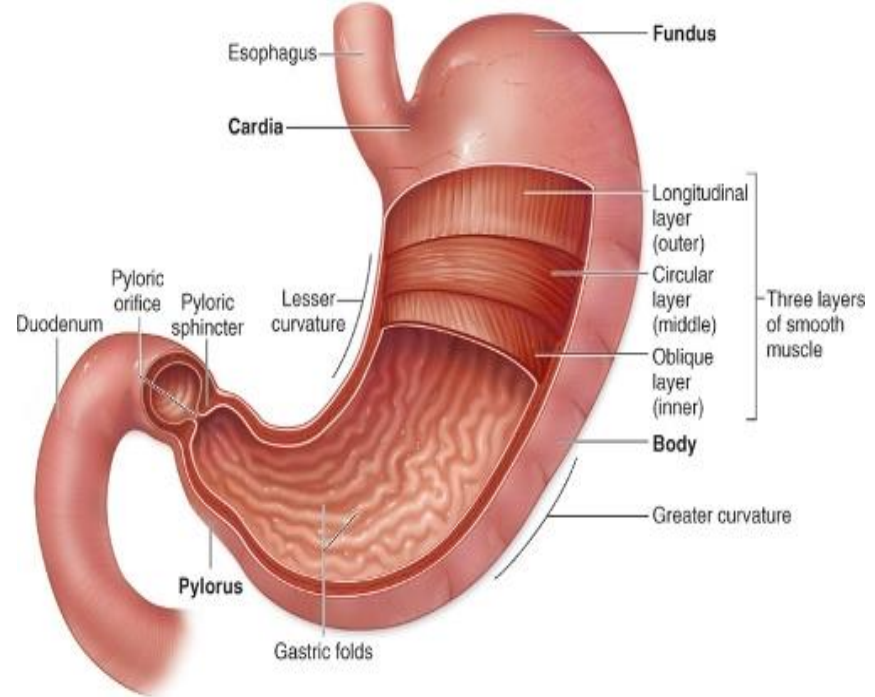
- Brings food from the mouth to the stomach through peristalsis
- Smooth muscle surrounding the esophagus contracts, forcing the food downward



THE PROCESS OF DIGESTION

Stomach

- Mechanical and chemical digestion
- Mechanical – Contractions churn and mix food
- Chemical – Glands produce mucus, hydrochloric acid and pepsin
 - Mucus – Coats and protects the inner lining
 - Hydrochloric Acid – Helps pepsin work better
 - Pepsin – Breaks proteins down into smaller fragments



THE PROCESS OF DIGESTION

Small Intestine

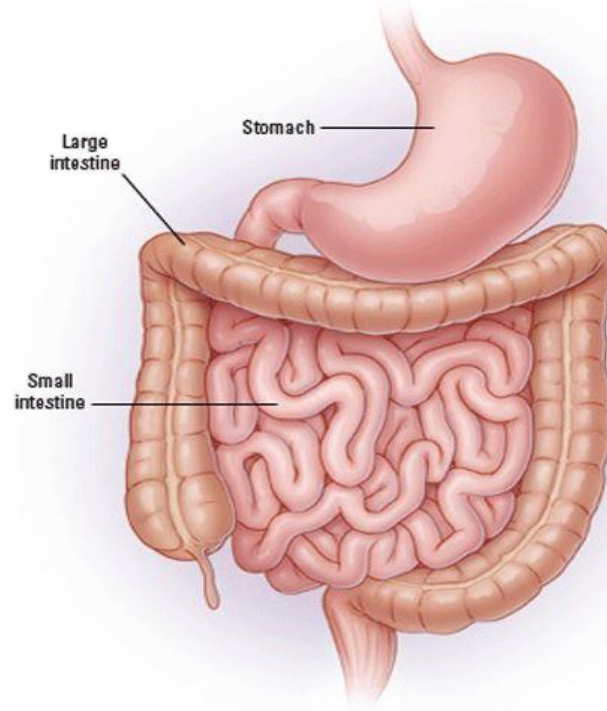
- Absorption of nutrients
 - Up until now, food has only been broken down chemically and mechanically
 - Villi are folds inside the small intestine, and have capillaries inside the folds



THE PROCESS OF DIGESTION

Large Intestine

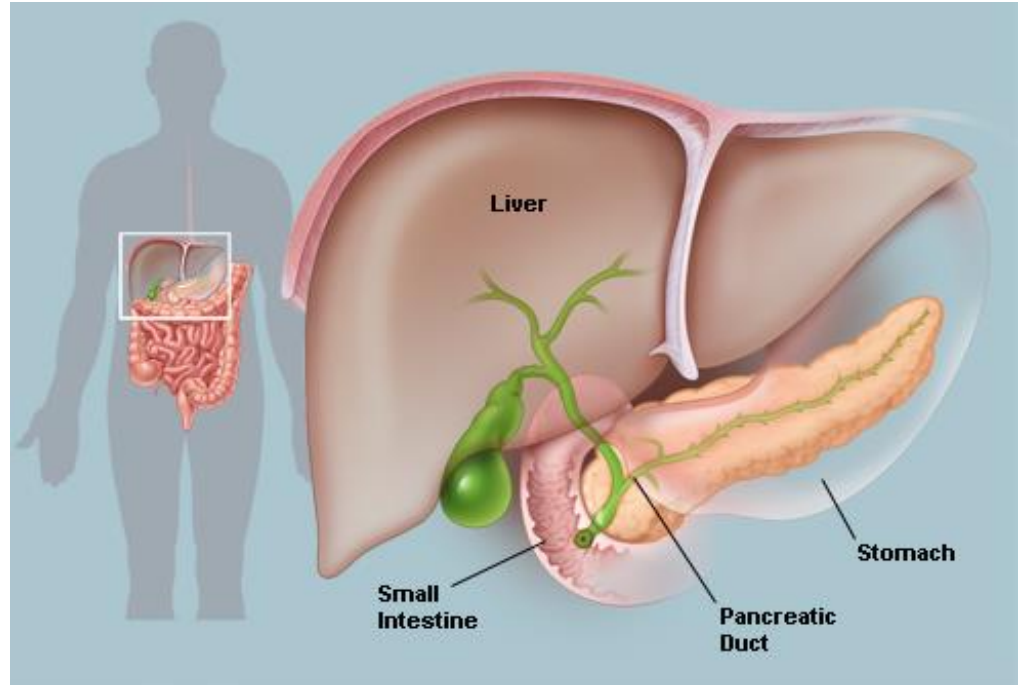
- Water absorption
 - Also called the colon
 - No digestion occurs here



ACCESSORY DIGESTIVE ORGANS

Liver

- Produces bile
 - Breaks down fats
 - Stored in the gall bladder



ACCESSORY DIGESTIVE ORGANS

Pancreas

- Gland that serves 3 functions
 - Produces insulin which regulates blood sugar levels
 - Produces enzymes that break down carbohydrates, proteins, and fats
 - Produces sodium bicarbonate, which neutralizes stomach acid

