

# Lesson 3: The Digestive Process Begins



## What are the functions of the digestive system?

- Organs have 3 main functions Digestion
  - 1) Absorption
  - 2) Elimination

**Digestion:** the process by which your body breaks down food into small nutrient molecules.

- Can be mechanical or chemical

## Absorption and Elimination

- **Absorption:** the process by which nutrient molecules pass through the wall of your digestive system into your blood.
  - Most happens in small intestine.
- Large intestine eliminates things not absorbed.

## What is the role of the mouth, esophagus, and stomach?

- Organs that do MECHANICAL DIGESTION

## Digestion begins in the mouth.

- Mechanical: Teeth and tongue cut, tear, crush, and grind food into smaller pieces.
- Chemical: Saliva moistens food and contains a chemical that can break down starch.
  - **Saliva:** fluid released by salivary glands when you eat.
  - **Enzymes:** a protein that speeds up chemical reactions in the body.

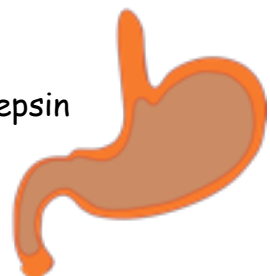


## The Esophagus

- Back of mouth has two openings --> one to lungs, one to stomach
  - **Epiglottis:** a flap of tissue that seals off your windpipe and prevents food from entering the lungs.
- **Esophagus:** a muscular tube that connects the mouth to the stomach.
  - Lined with **mucus:** thick, slippery substance that helps food move easily.
  - **Peristalsis:** involuntary muscle contractions that push food toward the stomach.

## The Stomach

- **Stomach:** a J-shaped muscular pouch in the abdomen where food goes when it leaves the esophagus.
  - Most mechanical digestion happens here. (some chem digestion also happens)
- Mechanical: layers of smooth muscle in stomach wall contract to produce a churning motion that mixes food with stomach fluids.
- Chemical: Happens as food is mixed with digestive juices.
  - Digestive juice produced by cells that line the stomach. Contains enzyme pepsin
  - Also has hydrochloric acid: strong acid with two jobs.
    - 1) Pepsin works best in acidic environment



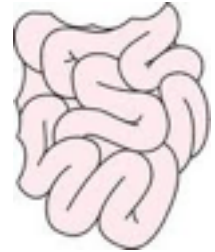
- 2) Kills many bacteria that you swallow with food
- Mucus protects stomach from acid
- Food stays in stomach for a few hours

## Lesson 4: Final Digestion and Absorption

### How do the small intestine, liver and pancreas function?

**Small Intestine:** the part of the digestive system where most chemical digestion happens.

- 6 meters long, 2-3 cm wide.
- Starches and proteins have been broken down by the time food gets to small intestine -- not fats!
- Where most chemical digestion and absorption of nutrients happens.
  - Liver and pancreas help with chemical digestion.



### Liver and Gallbladder

**Liver:** makes bile for the digestive system

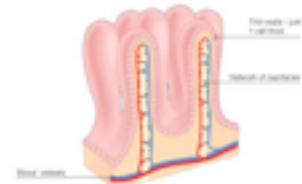
- **Bile:** a substance that breaks up fat particles.
- Bile is stored in the **gallbladder**.
  - Bile breaks up fat particles physically into smaller pieces --> enzymes break down pieces.

**Pancreas:** triangular organ that produces digestive enzymes that break down carbohydrates, proteins and fats.

- Cannot break down all substances --> like fiber

### Absorption in Small Intestine

- Absorption happens after chemical digestion
- **Villi:** tiny finger-shaped structures that line the inner surface of the small intestine and help absorption occur by increasing surface area of small intestine.



### What does the Large Intestine Do?

- Most nutrients absorbed by end of small intestine.
- **Large intestine:** last section of digestive system where water and undigested food moves to.
  - Water absorbed back into blood stream
  - Remaining materials readied for elimination
  - Contains bacteria that feed on material passing through.
  - Ends with short tube called **rectum**: where waste material is compressed into solid form.
  - **Anus:** opening at end of rectum where waste material is eliminated.

