The Human Body

Nutrition and Digestion
Mechanical digestion

- Chewing and grinding

Chemical digestion

- **Enzymes** (proteins) speed up chemical digestion
- Enzymes are food specific
<table>
<thead>
<tr>
<th>Organ</th>
<th>Enzyme</th>
<th>Molecules Digested</th>
<th>Product</th>
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<tr>
<td>Salivary glands</td>
<td>Salivary amylase</td>
<td>Starch</td>
<td>Disaccharide</td>
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<tr>
<td>Stomach</td>
<td>Pepsin</td>
<td>Proteins</td>
<td>Peptides</td>
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<tr>
<td>Pancreas</td>
<td>Pancreatic amylase</td>
<td>Starch</td>
<td>Disaccharide</td>
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<tr>
<td></td>
<td>Trypsin</td>
<td>Proteins</td>
<td>Peptides</td>
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<tr>
<td></td>
<td>Pancreatic lipase</td>
<td>Fats</td>
<td>Fatty acids and glycerol</td>
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<td>Nucleases</td>
<td>Nucleic acids</td>
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</tr>
<tr>
<td>Small intestine</td>
<td>Maltase</td>
<td>Disaccharide</td>
<td>Monosaccharide</td>
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<tr>
<td></td>
<td>Nuclease</td>
<td>Nucleotides</td>
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Digestive system

- Mouth → Pharynx → Esophagus → Stomach → Small intestine → Large intestine → Rectum
- Alimentary canal

Incisors

Gums

Tonsils

Opening of salivary gland duct

Cuspids or canines

Bicuspids or premolars

Molars

Tongue

Hard palate

Stomach

• Mechanical and chemical digestion
• Contains hydrochloric acid with low pH (pH around 2) and pepsin

Small Intestine

- Absorption of nutrients
- Nutrients diffuse through small intestine into blood
- Villi increase surface area and efficiency

The villi are the link between the digestive system and the circulatory system.

Large Intestine

• Absorption of water and minerals

Other digestive organs

Not part of alimentary canal

- Food doesn’t pass through them

Diaphragm

Eosophagus

Liver

Gallbladder

Stomach

Bile duct

Pancreatic duct

Duodenum

Pancreas

Small intestine
Pancreas

- **Produces insulin** – maintains blood sugar levels
- **Diabetics regulate their own insulin** with diet or injections of insulin
- **Releases digestive juices** into small intestine
- **Neutralize acidity** of food leaving stomach

Liver

- Produces **bile** to break down fats
- Gallbladder stores bile, releases into small intestine
- If gall bladder is removed, need **low fat diet** – bile secreted into intestine and not stored

The Human Body

The Excretory System
Excretion

- Removal of waste products
- Lungs, kidneys, skin
Kidneys **filter blood** (remove urea and nitrogen compounds, excess salts and water)

Blood cells, water, salts, nutrients, urea

Blood cells, water, salts, nutrients sent back to body

Urine: Urea, excess water, salts stored in bladder

**Nephron of Kidney**

Lungs remove carbon dioxide and water.
Skin removes urea with sweat