

Physical vs. Chemical Changes in Digestion

What is Matter?

- Anything and everything!
- Has MASS and TAKES UP SPACE!

Types of Physical Changes

- These changes only alter the APPEARANCE of the substance NOT their chemical composition!
 - Change in shape
 - Change in size
 - Change in mass
 - Change in the state matter

Signs of Chemical Changes

- These changes alter the substance so that a new substance with NEW properties appears and is NOT easily reversible:
 - Unexpected color change or odor
 - Release of heat, light, or sound
 - NOT easily reversible
 - Produces gas or water, or formation of a solid
 - NEW substance, with NEW properties

Test your real world skills!

- Color/dye your hair- physical or chemical?
- Bake a cake- physical or chemical?
- Ice cubes melting- physical or chemical?
- Rust on a nail- physical or chemical?
- Food breaking down in your stomach acid- physical or chemical?

The Digestive System

Purpose of the Digestive system:

- Breaks down food into substances that cells can absorb and use.

How is food digested?

- Breaking down of food into smaller pieces
- The mixing of food
- Movement through the digestive tract (friction)
- Chemical breakdown of the large molecules of food into smaller molecules

Mouth



- Teeth cut, break and grind food into smaller pieces.... **physical** (mechanical) digestion
- Chewing mixes the food with saliva, from salivary glands around the mouth and face, to make it moist and easy to swallow.
- Enzymes in the saliva begin **chemical** digestion of carbohydrates (sugars) for energy

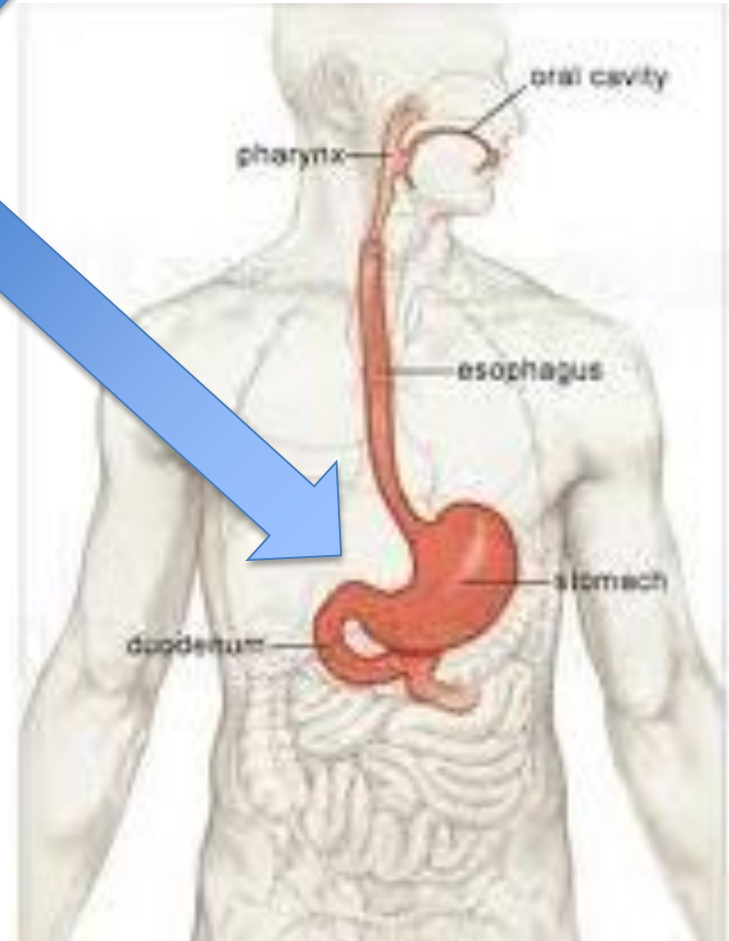
Esophagus

- A muscular tube
- It moves food by waves of muscle contraction called peristalsis.
- **Physically** moving the food along to the stomach.



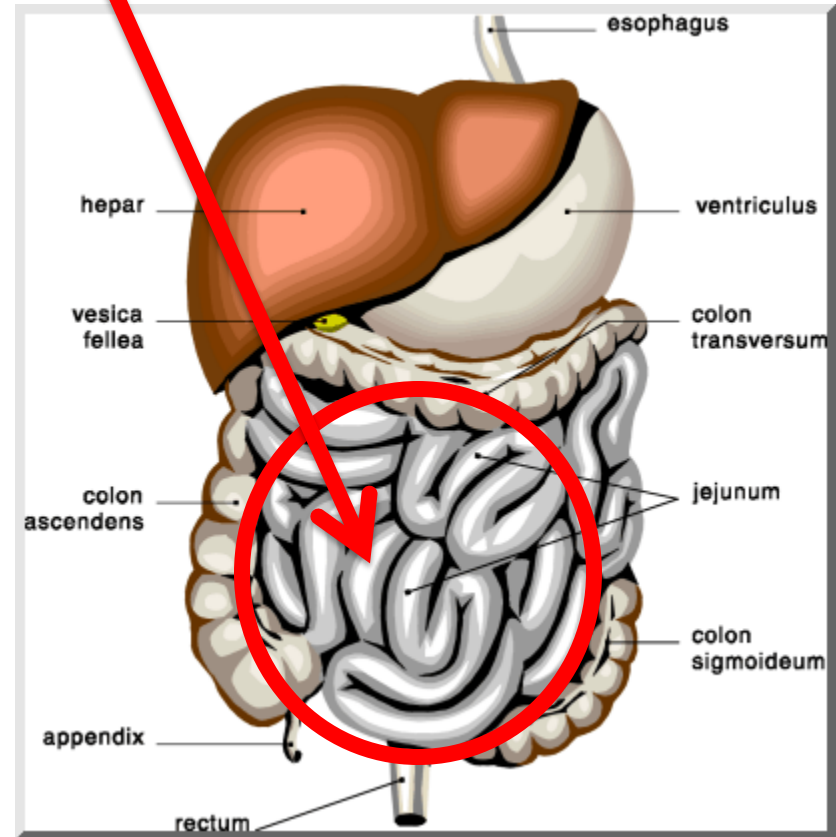
Stomach

- The stomach lining produces strong digestive juices (gastric acid), creating **chemical** reactions in the stomach, breaking down and dissolving its nutrients (proteins and fats)
- It **physically** breaks down food by churning (tossing) it around.



Small Intestine

- Enzymes continue the **chemical** reactions on the food, digesting of proteins, fats, and carbohydrates
- These nutrients are broken down small enough to pass through the lining of the small intestine, and into the blood (diffusion).
- **Physically** moves food to the large intestine.



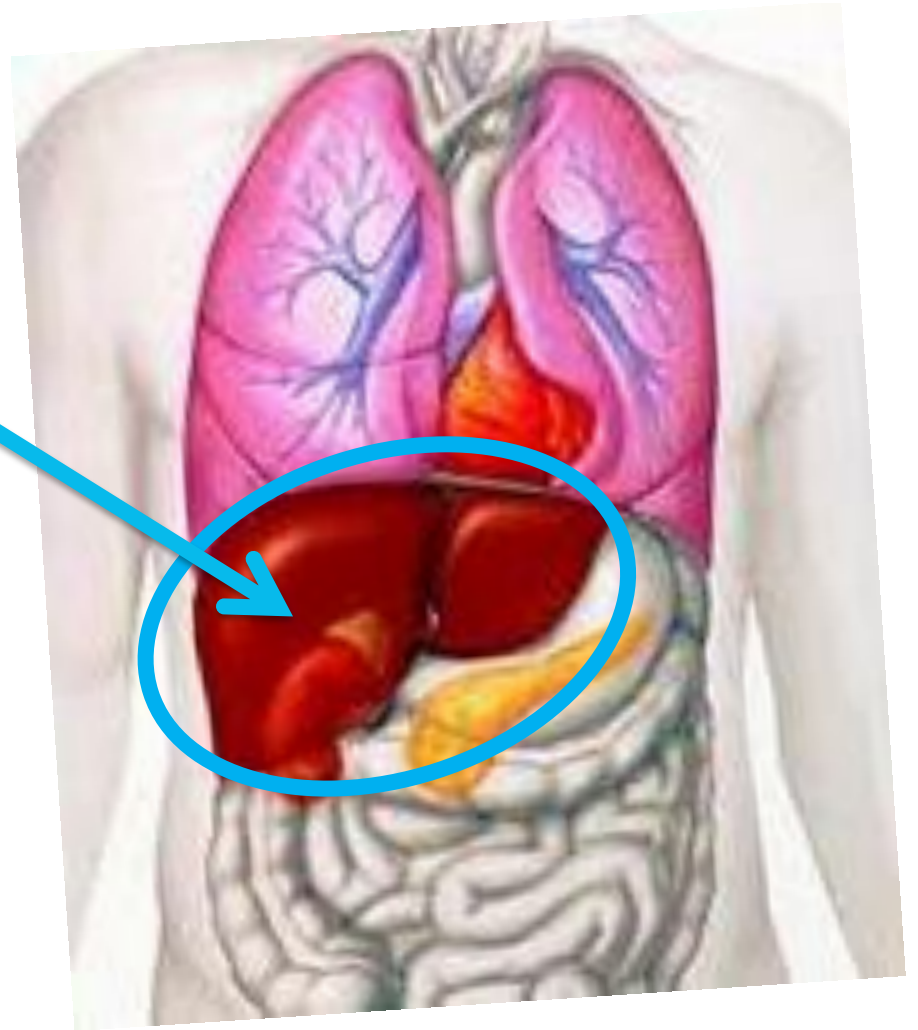
Pancreas

- Accessory organ (you don't NEED it to live)
- Food does not go through the pancreas (think of it as a “shower” of mild acids that help break down food in your small intestine)
- Produces **chemicals** to help break down macromolecules



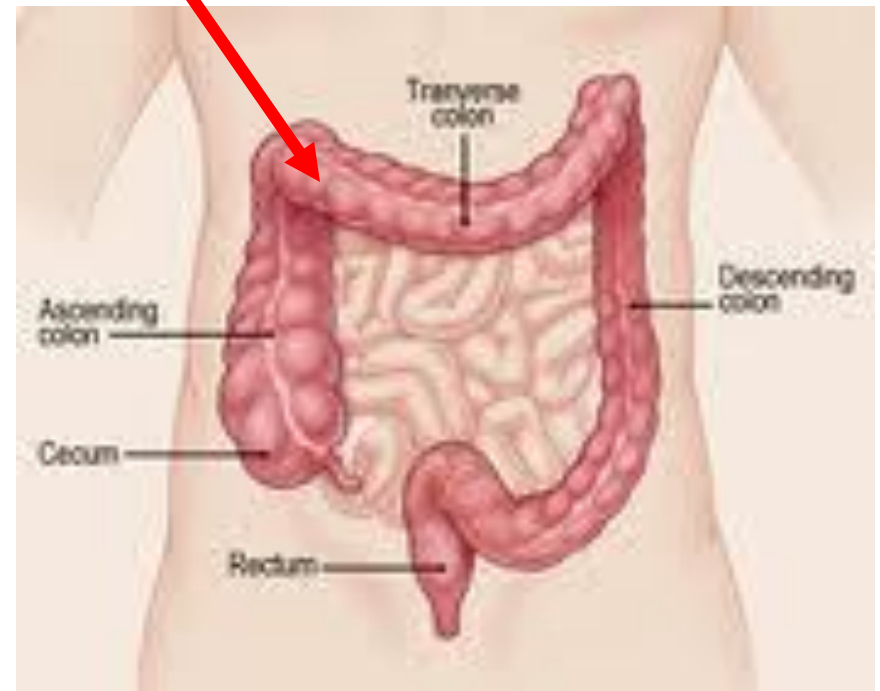
Liver

- Produces bile (acid) to help **chemically** digest fat



Large Intestine (Colon)

- **Physically** ABSORBBS (soaks up) extra nutrients & water
- Forms wastes into solid feces (poop 😊)
- **Physically** moves feces to the rectum/anus



Rectum and Anus

- The last section of the digestive tract
- The rectum extends from the large intestine to the anus
- The anus is where feces is **physically** stored for elimination from the body.

