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.
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.
• 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** ABSORB (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.