Digestion Lab
Warm-Up

• All organic compounds contain the element ___________ and other common elements such as S_____ H_____ O_____ P_____ N_____

• Distinguish between chemical and physical digestion.
  • Lipase breaking down lipids into fatty acids and glycerol
  • Absorbing water and nutrients
  • Peristalsis
  • Saliva breaking down carbohydrates into sugar
  • Churning and mixing of food
  • Chemical energy being transformed into thermal energy
  • Bile breaking fat into tiny droplets of fat
  • Pepsin breaking down proteins into amino acids
Warm-Up

• All organic compounds contain the element **Carbon** and other common elements such as **Sulfur**, **Hydrogen**, **Oxygen**, **Phosphorus**, and **Nitrogen**

• Distinguish between chemical and physical digestion.
  • Lipase breaking down lipids into fatty acids and glycerol **Chemical**
  • Absorbing water and nutrients **Physical**
  • Peristalsis **Physical**
  • Saliva breaking down carbohydrates into sugar **Chemical**
  • Churning and mixing of food **Physical**
  • Chemical energy being transformed into thermal energy **Chemical**
  • Bile breaking fat into tiny droplets of fat **Physical**
  • Pepsin breaking down proteins into amino acids **Chemical**
Task
• Digestion Lab

Goal
• We will be able to distinguish between physical and chemical changes in digestion.
• We will identify the major organs and order food passes through in the digestive system.
• We will recognize that large molecules are broken down into smaller molecules during the digestive process.
• Students will be able to identify advantages and limitations of a model.
Digestion in YOUR mouth

• Place a cracker in your mouth without chewing for 1 minute.
• Chew and swallow.

• Place a sucker in a cup of water.
• Place a sucker in your mouth and leave it during the lab. Do not bite!
• Record the time it took to dissolve or how much is left at the end of the lab, with the time.
Mouth

• Use plate, fork, and knife to break the food into smaller pieces.
• Add saliva and mix.
Esophagus

• Transfer the food down the paper tube.
• Use peristalsis to transfer the food down the tube.
Stomach

• Place the food into the bag.
• Add hydrochloric acid.
• Remove excess air.
• Seal the bag.
• Mix and churn the food into chime.
• Cut a corner off the bag.
Small Intestines

• Transfer the food into the towel.
• Inspect the tiny loops of the towel. These are similar to villi that are used during the absorption of nutrients.
  • Villi contain capillaries so the blood can transport the nutrients to all body cells.
• Add bile and pancreatic juices to the chyme.
  • The liver and pancreases are also part of the endocrine system.
• Open and feel a hot hands.
  • This represents how chemical energy in food is transformed into thermal energy during digestion.
• Squeeze the chyme down.
• Large molecules must be broken down into small molecules to be absorbed by the body
• Mouth (finished in small intestines) - Carbohydrates (starches) are large molecules that are broken down into simple sugars by salivary amylase (saliva)
• Stomach - Proteins are broken down into amino acids by pepsin
• Small Intestines - Lipids are broken down into fatty acids and glycerol by lipase
A closer look at absorption...

Food is absorbed (taken in) to the body in the small intestine. The walls of villi of the small intestine have small holes in them. Only small particles can pass through it:

Small Intestines

Inside the Body (blood vessel)

Large particles (starch) are left in the small intestines and small particles (glucose) go through into the blood.

The blood (circulatory) delivers the nutrients/energy to all body cells.
Large Intestines

• Transfer the food to the panty hose.
• This is where excess water from the chyme is absorbed.
Clean Up

• Discard the food, bag, and sucker.
• Pick out any big pieces of food from the rest of the supplies and put in the trash.
• Do not put anything but liquids down the sink.
• Rinse the sucker cup
• Return materials bucket.
Reflection

• Illustrate and describe digestion.
Reflection

- Illustrate and describe digestion.
  - Digestion begins in the mouth with large organic molecules, like carbohydrates.
  - Saliva and other enzymes chemically break down the molecules until they are small enough to be absorbed and used by the body.