Bill Nye the Science Guy
Digestion

Food is _fuel_ for the body.

Describe one of the experiments that showed how food is energy.
- Food powered car of science
- Literally burn nutrients to see it make the car go.

How do you know when you are hungry?
- Stomach muscles contract

How long does it take to digest food?
- Hours
  - 12-48

Our stomach lining is replaced every ___3 days__.

We consume approximately ___1 kg___ of food per day, and ___3 L___ of water per day.

The small intestine in an adult is approximately ___7___ meters long, and is ___4___ meters long in a child. The big intestine is about ___2___ meters long.

What is peristalsis?
- Food is pushed along by muscles in throat

We make approximately how much saliva per day?
- 1 L
INGESTION

- News and mixes food with saliva.
- Secretes saliva (contains various enzymes).
- Protects airway during swallowing.
- Allows air to pass to and from lungs.
- Passes food from the mouth to the stomach.
- Allows passage from mouth to esophagus and from esophagus to stomach.
- Prevents backflow from stomach to esophagus and from esophagus to mouth.
- Adds acid, enzymes, and fluid. Churns, mixes, and grinds food to a liquid mass.
- Allows passage from stomach to small intestine. Prevents backflow from small intestine.
- Manufactures bile salts, detergent-like substances, to help digest fats.
- Stores bile until needed.
- Conducts bile from the gallbladder to the small intestine.

Stomach

- Stores lymph cells.
- Secretes enzymes that digest all energy-yielding nutrients to smaller nutrient particles. Cells of wall absorb nutrients into blood and lymph.
- Manufactures enzymes to digest all energy-yielding nutrients and releases bicarbonate to neutralize acid chyme that enters the small intestine.
- Conducts pancreatic juice from the pancreas to the small intestine.
- Stomach
- Pancreas
- Pancreatic duct
- Small intestine (duodenum, jejunum, ileum)
- Reabsorbs water and minerals
- Passes waste (fiber, bacteria, and unabsorbed nutrients) along with water to the rectum
- Stores water prior to elimination
- Holds rectum closed
- Opens to allow elimination

ELIMINATION
**The Gastrointestinal Tract**

- **Mouth**: News and mixes food with saliva.
- **Pharynx**: Directs food from mouth to esophagus.
- **Salivary Glands**: Secrete saliva (contains starch-digesting enzymes).
- **Epiglottis**: Protects airway during swallowing.
- **Trachea**: Allows air to pass to and from lungs.
- **Esophagus**: Passes food from the mouth to the stomach.
- **Esophageal Sphincters**: Allow passage from mouth to esophagus and from esophagus to stomach. Prevent backflow from stomach to esophagus and from esophagus to mouth.
- **Stomach**: Aids acid, enzymes, and fluid. Churns, mixes, and grinds food to a liquid mass.
- **Pyloric Sphincter**: Allows passage from stomach to small intestine. Prevents backflow from small intestine.
- **Liver**: Manufactures bile salts, detergent-like substances, to help digest fats.
- **Gallbladder**: Stores bile until needed.
- **Bile Duct**: Conducts bile from the gallbladder to the small intestine.
- **Ileocecal Valve**: Allows passage from small to large intestine. Prevents backflow from large intestine.
- **Appendix**: Stores lymph cells.
- **Small Intestine**: Secretes enzymes that digest all energy-yielding nutrients to smaller nutrient particles. Cells of wall absorb nutrients into blood and lymph.
- **Pancreas**: Manufactures enzymes to digest all energy-yielding nutrients and releases bicarbonate to neutralize acid chyme that enters the small intestine.
- **Pancreatic Duct**: Conducts pancreatic juice from the pancreas to the small intestine.
- **Stomach**: Passed food.
- **Pyloric Sphincter**: Allows passage from stomach to small intestine.
- **Pancreas**: Passed food.
- **Pancreatic Duct**: Passed food.
- **Small Intestine** (duodenum, jejunum, ileum)
- **Large Intestine**: Reabsorbs water and minerals. Passes waste (fiber, bacteria, and unabsorbed nutrients) along with water to the rectum.
- **Rectum**: Stores water prior to elimination.
- **Anus**: Holds rectum closed. Opens to allow elimination.

**Elimination**