Notes: The Digestive & Urinary System

Objectives
- Know the importance of a balanced diet
- Identify and describe the structures of the digestive and excretory systems
- Explain how each of these structures function in order to accomplish the following:
  - Mechanical and chemical digestion of food
  - Absorption of nutrients
  - Balance the water content of the body
  - Get rid of metabolic wastes (solid & liquid)

Key Concept #1: Cells require many different __________________.
- There are six types of nutrients:
  1) __________________
  2) __________________
  3) __________________
  4) __________________
  5) __________________
  6) __________________
- Carbohydrates are the ____________________________ for the body.
  - simple and complex carbohydrates ______________________
  - from plant foods ____________________________
- Proteins are necessary for ____________________________ of the body’s cells.
  - body makes ________________ amino acids
  - other eight essential amino acids ____________________________
  - Most plant proteins are ____________________________ makeup
  - Individuals who eat only plant proteins need to eat a variety to get all essential amino acids
- Fats provide ____________________________ and key ____________________________.
  - fats are __________________ and __________________
    - butter, lard and oils
  - essential fatty acids come from food
- Minerals are ____________________________ needed in ____________ amounts
  - help to ____________________________
  - replenished by eating variety of foods
- Vitamins are ____________________________ that work with ____________________________.
  - vitamins are __________________ and __________________
    - fat-soluble: A, D, E, K
    - water-soluble: B, C (ascorbic acid), folic acid
  - regulate ____________________________, ____________________________, ____________________________
- A ____________________________ of whole foods provides the best nutrients and calories.
  - ________________ and ____________________________ also need to be balanced.
- Unbalanced diets can lead to ____________________________ or ____________________________.
  - ________________ occurs in when you don’t get the right nutrients for your body, or you over consume some nutrients.
  - ________________ is when you lack the essential nutrients your body needs in order to function properly.

Key Concept #2: The main stages of food processing are ingestion, digestion, absorption, and elimination
- Ingestion is the act of ____________________________
- Digestion is the process of ____________________________ small enough to absorb
- Absorption is ____________________________ by body cells
- Elimination is the ____________________________ out of the digestive compartment
- More complex animals have a digestive tube with two openings, a ____________________________ and an ____________________________
  - This digestive tube is called a complete digestive tract or an ____________________________
  - It can have ____________________________ that carry out ____________________________ in a stepwise fashion
**Key Concept #3:** Each organ of the mammalian digestive system has specialized food-processing functions

- The **human digestive system** consists of an ___________________ and ___________________ that secrete ___________________ through ducts
- **Accessory glands** are the
  - ___________________
  - ___________________
  - ___________________
  - ___________________
- Food is pushed along by ___________________, rhythmic contractions of muscles in the wall of the canal

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**The Oral Cavity, Pharynx, and Esophagus**

- In the oral cavity, food is ___________________ and ___________________.
- **Teeth** ___________________ into smaller particles that are exposed to ___________________, initiating ___________________.
- The region we call our throat is the ___________________, a junction that opens to both the ___________________ and the ___________________.
- The ___________________ pushes food from the pharynx down to the stomach by peristalsis.

**The Stomach**

- The **stomach** ___________________ and secretes ___________________, which converts a meal to acid ___________________.
- ___________________ is made up of ___________________ and the enzyme ___________________.
- **Pepsin** is secreted as inactive ___________________ by ___________________; pepsin is activated when mixed with hydrochloric acid in the stomach.
  - It’s purpose is to break down ___________________
- **Mucus** ___________________ the stomach lining from gastric juice.
o **Gastric ulcers**, ____________________________ in the lining, are caused mainly by the bacterium

The Small Intestine
o The **small intestine** is the longest section of the alimentary canal
o It is the major organ of ____________________________
  - The first portion of the small intestine is the ____________________________
    - Where acid __________________ from the stomach mixes with ________________________ from the ____________________________, and the small intestine itself

The Pancreas
o The pancreas has both ____________________________ and ____________________________ (hormone) functions.
Digestive Function
- Releases ____________________ to ____________________ the acid chyme that enters the small intestine
- Releases ____________________ to help with further digestion of ____________________

Endocrine Function
- Releases ____________________ & ____________________ to control ____________________

The Liver
- The liver produces ____________________, which aids in digestion and absorption of ____________

The Small Intestine: Absorption of Nutrients
- Most absorption will take place in the ____________________ and ____________________ of the small intestine.
- The small intestine has a large ____________________, due to ____________________ that are exposed to the intestinal lumen
- The enormous microvillar surface greatly ____________________

The Large Intestine
- The large intestine, or ____________________, is connected to the small intestine
- Its major function is to ____________________, that has entered the alimentary canal
- Wastes of the digestive tract, the ____________________, become more solid as they move through the colon
- Feces is stored in the ____________________ until it exits via the ____________
- The colon houses strains of the bacterium ____________________, some of which produce ____________

Glucose Regulation as an Example of Homeostasis
- Animals store excess calories as ____________________, and ____________________
- Hormones like ____________________ & ____________________ regulate glucose metabolism
- When fewer calories are taken in than are expended, fuel is taken from storage and broken down to be used by cells.
**Key Concept #4**: The excretory system eliminates nonsolid wastes from the body.

- Nonsolid wastes are eliminated through lungs, skin, and ________________.
  - **Lungs** exhale ________________ and ________________.
  - **Sweat glands** in skin release ________________ and ________________.
  - **Kidneys** ________________ and clean the ________________ to produce ________________.

**The kidneys help to maintain homeostasis by filtering the blood.**

- Kidneys are a pair of bean-shaped organs.
  - two layers: ________________ and ________________
  - filtering units called ________________
  - ________________ supplies the blood to the kidney and the ________________ takes it back to the heart.

- Kidneys have three basic functions in maintaining homeostasis.
  - ________________
  - help to ________________
  - ________________

- Nephrons clean the blood and produce urine.
  - **Nephrons** are the ________________ in the kidneys.
  - They ________________ the blood to produce urine.
Nephrons clean the blood in a three-step process.

- **Filtration**
  - The blood enters through the ___________ and into a ball of capillaries known as the ___________.
  - Blood pressure forces plasma into the ___________.
  - The liquid is now called ___________.
    - This liquid contains a mix of nutrients, water, and waste. As it travels through the nephron, the nutrients and water are reclaimed and the waste is released.

- **Reabsorption**
  - As the filtrate enters the rest of the tubule, most of the ___________ into the blood.

- **Excretion**
  - Water is reabsorbed into the blood as the filtrate passes through the ___________ and the ___________.

- **Pathway of fluid:**
  - ___________
  - ___________
  - ___________
  - ___________
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**Injury and disease can damage kidney functions.**

- A ___________ can replace a damaged kidney.
  - recipient and donor tissue must match
  - drugs prevent tissue rejection
- ___________ can be used to filter and clean the blood like the kidneys.