

Digestive system learning outcomes



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Main functions of digestive system digestion breaks food into particles small enough to pass through the cells plasma membrane; after digestion circulation carries nutrients to the cells in every part of the body (absorption); undigested waste material is eliminated
4 layers of digestive wall tract mucous membrane: the epithelium has multiple layers of squamous cells & remainder of digestive tract simple columnar; goblet cells are between epithelial cells

submucosa: blood vessels & nerves

smooth muscle layer: aids in peristalsis

serous membrane: simple squamous epithelium & loose connective tissue which forms part of the peritoneum

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Now Differentiate between the 2 layers of the peritoneum mesentery: double layered & shaped like fan; the handle is attached to the posterior abdominal wall & the expanded long edge is attached to small intestine; the section of the peritoneum that extends from the colon to the posterior abdominal wall is the mesocolon

greater omentum: lg double layer of fat that hangs over the front of the intestine; extends from the lower border of the stomach to the pelvic cavity & loops back up to the transverse colon; a smaller membrane called the lesser omentum extends between the stomach & the liver

Name & describe the functions of the organs of the digestive tract the mouth: ingestion.

mastication, salivary amylase, deglutition

the teeth: incisors (cutting teeth), cuspids (canines) grip and tear food, molars are lg posterior grinding teeth; dentin (main substance in teeth harder than bone, enamel is the hardest substance in the body

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the pharynx: the soft palate & uvula prevent food from entering nasal cavity;

the epiglottis covers the opening of the larynx

esophagus: 10 in long tube that lubricates food

the stomach: J shaped organ with 2 sphincters that separate it from organs

above & below; the LES (cardiac sphincter) separates the esophagus from the

region of stomach close to the heart; the pylorus (pyloric sphincter) is

important in regulating how rapid food moves into small intestine; secretes

gastric juice containing HCl & pepsin; chyme is a mix of gastric juice & food

that leaves the stomach to enter the SI

the small intestine: the 1st 10 inches is the duodenum; jejunum is the

middle of SI; remaining portion is ileum; SI secretes enzymes that digest

proteins & carbs & digestive juices from liver & pancreas enter through hole

in the duodenum; most digestion, absorption of digested food, water &

minerals takes place in the SI with help of villi; each villus contain blood

vessels through which digestion products are absorbed into blood

the large intestine: 5 ft long named for its diameter not its length; begins in

the lower right region of abdomen; the 1st part is the cecum; between the

ileum of the SI & the cecum is a sphincter (ileocecal valve) that prevents food

from backing up into SI; the 2nd portion is the ascending colon; the sigmoid

colon leads to the rectum; secretes mucus but no enzymes; food is not

digested but water is reabsorbed; food residue is stored & bacteria that live

in the colon act to produce vit K & some B complex vitamins

Name & describe the functions of the accessory organs of digestion

salivary glands: lysozymes help reduce bacterial growth; salivary amylase converts starch to sugar;

saliva is manufactured by 3 parts of glands (parotid, submandibular,

sublingual)

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the liver: the liver is supplied blood through the portal vein & hepatic artery; manufactures bile; stores glucose in form of glycogen; stores some vitamins & iron; forms blood plasma proteins, destroys RBC's creating bilirubin; synthesizes urea

the gallbladder: bile from the liver flows into the hepatic ducts then up through the cystic duct connected w the gallbladder; the pancreas: produces enzymes that digest fats, proteins, carbs, & nucleic acids; the protein digesting enzymes are produced in inactive forms which are converted to active forms in the SI by other enzymes; releases lg amounts of sodium bicarbonate that neutralizes the acidic chyme in the SI; functions as an endocrine gland producing hormones insulin & glucagon that regulate sugar metabolism

How does bile function in digestion it processes fats; the salts contained in the bile act as detergent to emulsify fat by breaking it into small droplets; bile also aids in fat absorption in the small intestine

Name & locate the ducts that carry bile from the liver into the digestive tract

bile leaves through the common hepatic duct and after collecting bile from the gallbladder the duct becomes the common bile duct and delivers bile to duodenum

Explain the role of enzymes in digestion & give examples of enzymes

enzymes are proteins that speed up chemical reactions; lipase digests most fats after bile divided it into particles, fats are then broken down into simpler compounds (glycerol & fatty acids); amylase changes starch to sugar; trypsin splits proteins into amino acids which are absorbed through the intestine; nucleases digest DNA & RNA

Name the digestion products of fats, proteins, and carbohydrates... Absorption

most absorption takes place through the villi and mucosa of the SI; most fats are absorbed by the villi

more permeable lymphatic capillaries (lacteals), the mix of

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lymph & fat globules that drain from the SI after fat has been digested (chyle) eventually enters the blood when the lymph drains in veins near the heart; minerals & vitamins ingested with food are also absorbed from the SI, they dissolve in water & are absorbed directly into blood

Define villi & how it works in absorption
each villus is an arteriole & venule bridged with capillaries, simple sugars, sm proteins, amino acids, & some fatty acids are absorbed into blood through these capillaries; each villus contains blood vessels through which most digestion products are absorbed by the blood; they also contain a lacteal

Explain use of feedback in regulating digestion & give examples
when chyme enters the duodenum nerve impulses inhibit stomach motility so food wont move to rapidly to SI, this is an example of negative feedback

List hormones involved in regulating digestion
gastrin: in stomach stimulates release of gastric juice
secretin: in the duodenum stimulates insulin release of water & bicarbonate from pancreas, stimulates release of bile from liver, inhibits stomach
gastric inhibitory peptide: stimulates insulin release from pancreas when glucose enters duodenum; inhibits release of gastric juice
cholecystokinin: in duodenum stimulates release of digestive enzymes from pancreas, stimulates release of bile from gallbladder; inhibits the stomach

Common disorders of the digestive tract & the accessory organs
peritonitis (inflammation of the peritoneum), diseases of the mouth & teeth, disorders of esophagus & stomach (hiatal hernia, GERD, stomach cancer, peptic ulcer, intestinal disorders (appendicitis, IBD, Crohn disease, gastroenteritis, diverticulitis), constipation, intestinal obstruction, infection of salivary glands (parotitis), cirrhosis, jaundice, hepatitis, gallstones, pancreatitis

Hepatitis C blood & sex transmitted, no vaccine
Hepatitis D blood

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to blood, no vaccine
Hepatitis E underdeveloped regions, no vaccine
Hepatitis A commonly transmitted through fecal matter & contaminated food & water, has vaccine
Hepatitis B transmitted through blood & body fluids but can be spread through fecal contamination; people with this form of hepatitis may be carriers with no symptoms; usually transmitted through needles