مراجعة نهائية Biology منهج انسباير

التواصل الاجتماعي بحسب الصف الثاني عشر العام					
صفحة المناهج الإماراتية على فيسبوك					
المواد على تلغرام	التربية الاسلامية	اللغة العربية	اللغة الانجليزية	الرياضيات	

المزيد من الملفات بحسب الصف الثاني عشر العام والمادة علوم في الفصل الأول	
1	ملخص system Digestive الجهاز الهضمي متبوع بتدريبات منهج انسباير
2	تجميعة أسئلة مراجعة وفق الهيكل الوزاري الجديد منهج انسباير
3	ملخص درس التغذية خرائط ذهنية
4	ملخص درس الجهاز الإخراجي
5	ملخص القسم الثالث جهاز الغدد الصماء من الوحدة الأولى

BIOLOGY

G12 General

2025-2026

LESSON 1

THE DIGESTIVE SYSTEM

FOCUS QUESTION

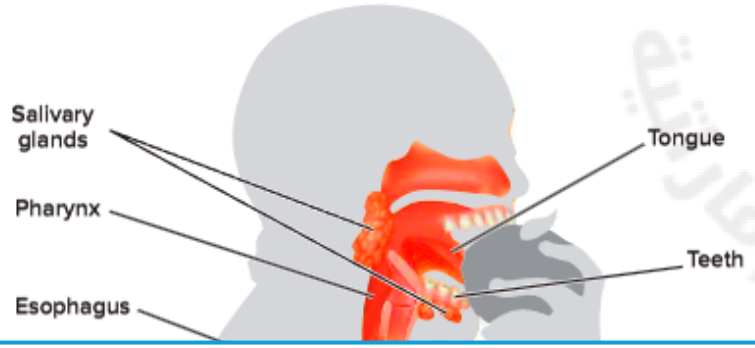
What are the structures and functions of the digestive system?

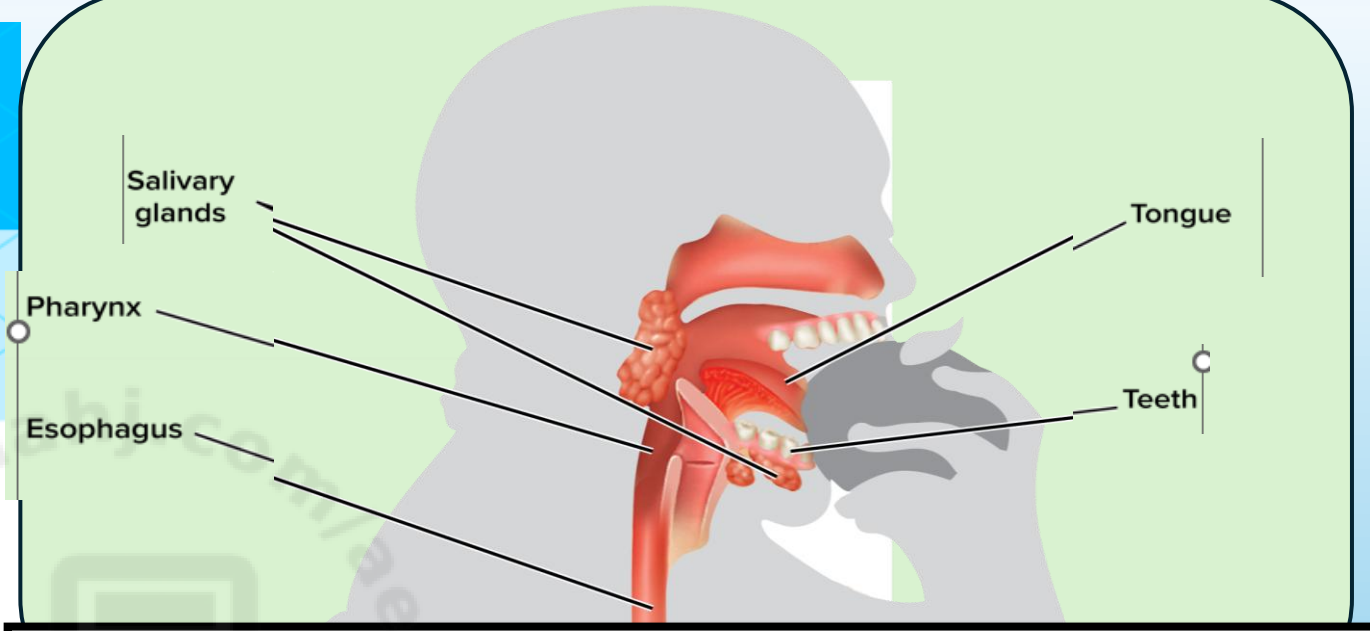
Functions of the Digestive System

There are three main functions of the digestive system. The digestive system ingests food, breaks it down so nutrients can be absorbed, and eliminates what cannot be digested. Refer to **Figure 1** below and **Figure 2** on the next page as you learn about the structure and function of the digestive system.

Digestion

Mechanical digestion involves chewing food to break it down into smaller pieces. It also includes the action of smooth muscles in the stomach and small intestine that churn the food. **Chemical digestion** involves the breakdown of large molecules in food into smaller substances by enzymes, proteins that speed





Digestion

Mechanical vs Chemical Digestion

- **Mechanical digestion:** Chewing food, churning in stomach/small intestine.
  Chemical digestion: Breakdown of large molecules by **enzymes** proteins that speed up chemical reactions (e.g., amylase in saliva, begins the process of chemical digestion by breaking down starches into sugars. pepsin in stomach that digests proteins into peptide.)

BY / Mr.: (

Chemical digestion

Mechanical digestion

Functions of the Digestive System

Ingestion: Taking in food.

Digestion: Breaking down food mechanically and chemically.

Absorption: Nutrients absorbed into the bloodstream.

Elimination: Removal of indigestible materials as feces.

Enzymes, proteins that speed up chemical reactions. The smaller substances are absorbed into the body's cells

chewing food

break it down

action of smooth muscles

Digestive system الجهاز الهضمي	System that ingests food, digests it, absorbs nutrients, and eliminates waste.	جهاز يقوم بابتلاع الطعام، وهضمه، وامتصاص المغذيات، والتخلص من الفضلات.
Ingestion الابتلاع	The process of taking in food or drink into the body through the mouth.	عملية إدخال الطعام أو الشراب إلى الجسم عن طريق الفم.
Mechanical digestion الهضم الميكانيكي	Physical breakdown of food into smaller pieces, mainly by chewing and churning.	التفكيك الفيزيائي للطعام إلى قطع أصغر، أساسًا عن طريق المضغ والتحريك.
Chemical digestion الهضم الكيميائي	The breakdown of large food molecules into smaller substances by enzymes.	تفكيك الجزيئات الغذائية الكبيرة إلى مواد أصغر بواسطة الإنزيمات.
Salivary glands الغدد اللعابية	Glands in the mouth that secrete saliva to moisten food and start chemical digestion.	غدد في الفم تفرز اللعاب لترطيب الطعام وبدء الهضم الكيميائي.
Amylase الأميليز	Enzyme in saliva that breaks down starch into sugars.	إنزيم في اللعاب يحلل النشاء إلى سكريات.

1. Which of the following best describes the primary function of the digestive system?
   a) Transporting oxygen to cells
   b) Ingesting, digesting, absorbing, and eliminating food
   c) Breaking down proteins only
   d) Storing nutrients permanently
2. What is the process of taking food into the body called?
   a) Digestion b) Ingestion c) Absorption d) Elimination
3. Mechanical digestion involves:
   a) Enzyme activity
   b) Breakdown of food by chewing and churning
   c) Conversion of food into glucose
   d) Absorption of amino acids
4. Which enzyme in saliva breaks starch into sugars?
   a) Pepsin b) Lipase c) Amylase d) Trypsin

The epiglottis prevents choking by: .5

a) Blocking the esophagus

b) Covering the trachea during swallowing

c) Releasing bile

d) Absorbing food into the bloodstream

Which statement best explains why mechanical and chemical digestion must work together?

A. Mechanical digestion produces enzymes that begin chemical reactions.

B. Chemical digestion softens food to allow for swallowing

C. Mechanical digestion increases the surface area for enzyme action.

D. Chemical digestion only occurs after absorption begins.

2. During digestion, the enzyme amylase acts specifically on starch because—

A. enzymes are general catalysts for all nutrients.

B. amylase has an active site complementary to starch molecules

Cstarch molecules contain nitrogen, like amylase.

D. amylase is activated only in the stomach.

3. Smooth muscles in the stomach and small intestine aid digestion primarily by——

A. releasing hormones that speed enzyme action.

.B. secreting digestive enzymes into the bloodstream..

C. churning and mixing food to enhance chemical breakdown

D. increasing blood flow to digestive .

4. What would most likely occur if the salivary glands stopped producing amylase

A. Fats would not be broken down in the mouth

B. Proteins would digest more slowly.

C. Starch digestion would not begin until food reaches the small intestine.

.D. Absorption of glucose in the stomach would increase.

5. Which best describes the relationship between digestion and absorption?

A. Digestion breaks nutrients down so they can be absorbed by cells.

B. Absorption must occur before digestion can begin

C. Absorption transforms nutrients into enzymes

D. Digestion and absorption occur only in the large intestine

Mirna is constructing a model of the human digestive system for health class. As part of the project, she must research the basic structures of the digestive system. What structures does she not research as parts of the digestive system?

A.Liver, pancreas, and gallbladder

B. mouth and esophagus

C. skeleton and joints

D. stomach and intestines

Esophagus

When the tongue pushes chewed food to the back of the mouth, the swallowing reflex is stimulated. The food is forced by the action of the tongue into the upper portion of the esophagus. The **esophagus** (ih SAH fuh gus) is a muscular tube that connects the pharynx, or throat, to the stomach, as illustrated in **Figure 2**. The wall of the esophagus is lined with smooth muscles that contract rhythmically to move the food through the digestive system in a process called **peristalsis** (per uh STAHL sus). Peristalsis continues throughout the digestive tract. Even if a person were upside down, food would still move toward the stomach.

When a person swallows, the small plate of cartilage called the epiglottis covers the trachea. If this opening is not closed, food can enter the trachea and cause a person to choke. The body responds to this by initiating the coughing reflex in an attempt to expel the food to keep the food from entering the lungs.

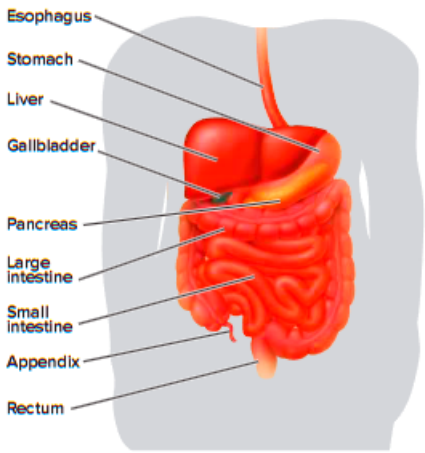


Figure 2 The human digestive system is made up of numerous parts, including the esophagus, which extends from the pharynx to the stomach and is approximately 25 cm long.

Get It?
Explain the importance of peristalsis to digestion.

Stomach

When food leaves the esophagus, it passes through a circular muscle called a sphincter, and into the stomach. The sphincter between the esophagus and stomach is the cardiac sphincter. The walls of the stomach are composed of three overlapping layers of smooth muscle that are involved with mechanical digestion. As the muscles contract, they further break down the food and mix it with the secretions of glands that line the inner wall of the stomach.

CHEMISTRY Connection Recall that pH is a measure of a solution's acidity. The environment inside the stomach is very acidic. Stomach glands, called gastric glands, secrete an acidic solution, which lowers the pH in the stomach to about 2. This is about the same level of acidity as lemon juice. If the sphincter in the upper portion of the stomach allows any leakage, some of this acid might move back into the esophagus, causing what is commonly known as heartburn.

The acidic environment in the stomach is favorable to the action of **pepsin,** an enzyme involved in the process of the chemical digestion of proteins. Cells in the lining of the stomach secrete mucus to help prevent damage from pepsin and the acidic environment. Although most absorption occurs in the small intestine, some substances, such as alcohol and aspirin, are absorbed by cells that line the stomach. While empty, the capacity of the stomach is about 50 mL. When full, it can expand to 2–4 L.

Get It?
Explain how both mechanical and chemical digestion occur in the stomach.

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الأستاذ جمال قاسم

Mouth

- Mechanical digestion: Chewing.
- Chemical digestion: Salivary amylase breaks starch into sugar.
- Food moves to the **pharynx → esophagus**.

The food is forced by the action of the tongue into the upper portion of the esophagus

Esophagus

- Muscular tube connecting pharynx to stomach.
- Moves food by **peristalsis** (rhythmic contraction).
- **Epiglottis** prevents choking by covering the trachea during swallowing.

approximately **25 cm** long.

Peristalsis and Swallowing

- **Peristalsis**: Rhythmic contractions of smooth muscles move food throughout the digestive tract. Food continues moving toward the stomach even if a person is upside down.

Pharynx البلعوم	The throat; passageway for food from mouth to esophagus.	الحلق؛ ممر لنقل الطعام من الفم إلى المريء.
Esophagus المريء	Muscular tube that connects the pharynx to the stomach; moves food by peristalsis.	أنبوب عضلي يربط البلعوم بالمعدة؛ ينقل الطعام بالحركة الدودية.
Epiglottis لسان المزمار	A flap of cartilage that covers the trachea during swallowing to prevent choking.	صفيحة غضروفية تغلق القصبة الهوائية أثناء البلع لمنع الاختناق.
Peristalsis الحركة الدودية	Rhythmic contractions of smooth muscles that move food along the digestive tract.	انقباضات إيقاعية للعضلات الملساء تدفع الطعام عبر الجهاز الهضمي.
Stomach المعدة	Muscular organ that continues mechanical digestion and secretes acid and enzymes.	عضو عضلي يكمل الهضم الميكانيكي ويفرز الحمض والإنزيمات.
Cardiac sphincter المصرة القلبية	Muscular valve that regulates food entry into the stomach from the esophagus.	صمام عضلي ينظم دخول الطعام إلى المعدة من المريء.
Gastric glands الغدد المعدية	Glands in the stomach that secrete gastric juice including acid and enzymes.	غدد في المعدة تفرز العصارة المعدية التي تحتوي على حمض وإنزيمات.
Ph الأس الهيدروجيني	A measure of acidity or alkalinity of a solution.	مقياس يحدد درجة الحموضة أو القلوية للمحلول.
Pepsin الببسين	An enzyme in the stomach that digests proteins into peptides.	إنزيم في المعدة يهضم البروتينات إلى ببتيدات.

The muscular walls of the stomach contract and push food farther along the digestive tract. As the result of chemical and mechanical digestion in the stomach, the consistency of the food resembles tomato soup as it passes through the pyloric sphincter at the lower end of the stomach into the small intestine.

Get It?
Compare digestion in the mouth with digestion in the stomach.

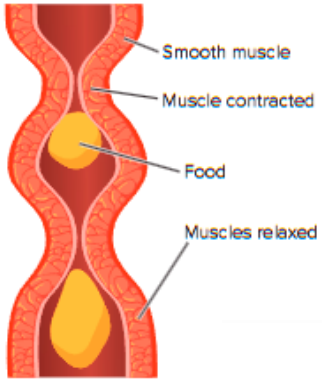


Figure 3 The smooth muscles in the walls of the digestive tract contract in the process of peristalsis.

Small intestine

The **small intestine** is approximately 7 m in length and is the longest part of the digestive tract. It is called small because its diameter is 2.5 cm compared to the 6.5 cm diameter of the large intestine. The smooth muscles in the wall of the small intestine continue the process of mechanical digestion and push the food farther through the digestive tract by peristalsis, as shown in **Figure 3.**

The completion of chemical digestion in the small intestine depends on three accessory organs—the pancreas, liver, and gallbladder, as illustrated in **Figure 4**. The pancreas serves two main functions. One is to produce enzymes that digest carbohydrates, proteins, and fats. The other is to produce hormones, which will be discussed later in this module. The pancreas secretes an alkaline fluid to raise the pH in the small intestine to slightly above 7, which creates a favorable environment for the action of intestinal enzymes.

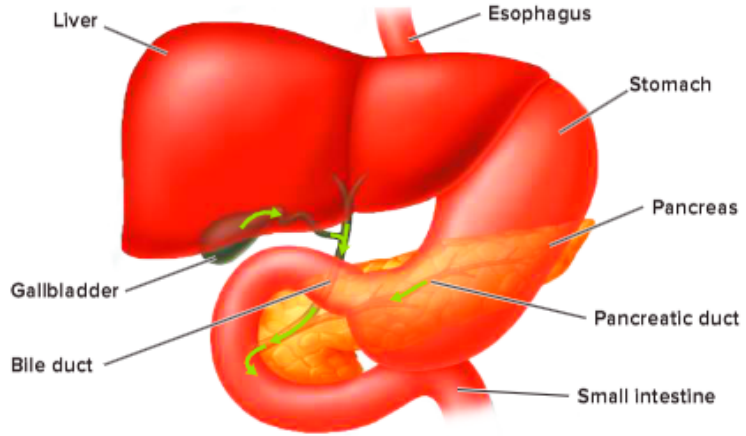
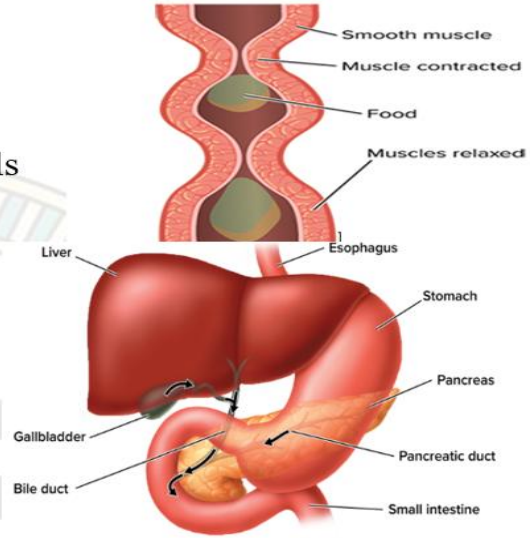


Figure 4 Chemical digestion in the small intestine depends on the activities of the liver, pancreas, and gallbladder.
Discuss *the importance of each of these organs in the process of chemical digestion.*

Small Intestine

- **Length & diameter**: longest part of the digestive tract; called "small" due to its narrow diameter compared to the large intestine.
- **Mechanical digestion**: Smooth muscles in the walls continue **peristalsis**, moving food along the tract.
- **Chemical digestion**: Depends on **accessory organs – pancreas, liver, and gallbladder**.



Pancreas:

Produces enzymes that digest carbohydrates, proteins, and fats. Produces hormones (like insulin).
Secretes alkaline fluid to raise small intestine pH slightly above 7 for enzyme activity.

1-the pancreas

- produce enzymes that digest carbohydrates, proteins, and fats

2-produce hormones

3- secretes an alkaline fluid to raise the pH to slightly above 7

2-liver

is the largest internal organ of the body

• produces bile, which helps to break down fats.

excess bile is stored in the gallbladder to be released into the small intestine when needed next Figure shows gallstones, which are cholesterol crystals

a) Peristalsis b) Diffusion c) Segmentation d) Filtration

7. What structure controls food entry from the esophagus into the stomach?
   a) Pyloric sphincter b) Cardiac sphincter c) Epiglottis d) Rectum
8. Which enzyme in the stomach digests proteins into peptides?
   a) Amylase b) Pepsin c) Lipase d) Trypsin
9. The semi-liquid mixture of food and gastric juices is called:
   a) Chyme b) Bolus c) Bile d) Feces
10. The longest part of the digestive tract, responsible for most absorption, is the:
    a) Stomach b) Small intestine c) Large intestine d) Esophagus
11. Which organ produces bile?
    a) Pancreas b) Gallbladder c) Liver d) Stomach
12. Where is bile stored?
    a) Stomach b) Pancreas c) Small intestine d) Gallbladder
13. Fingerlike projections in the small intestine that increase absorption are called:
    a) Villi b) Microtubules c) Cilia d) Nephrons
14. The large intestine primarily functions to:
    a) Digest proteins b) Absorb water and minerals
    c) Produce insulin d) Secrete enzymes

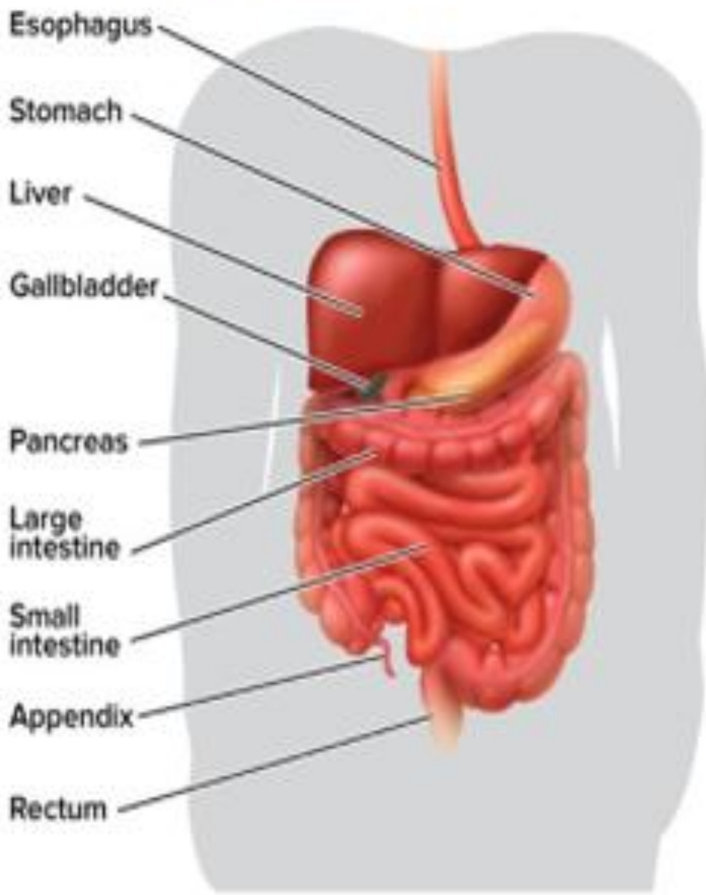
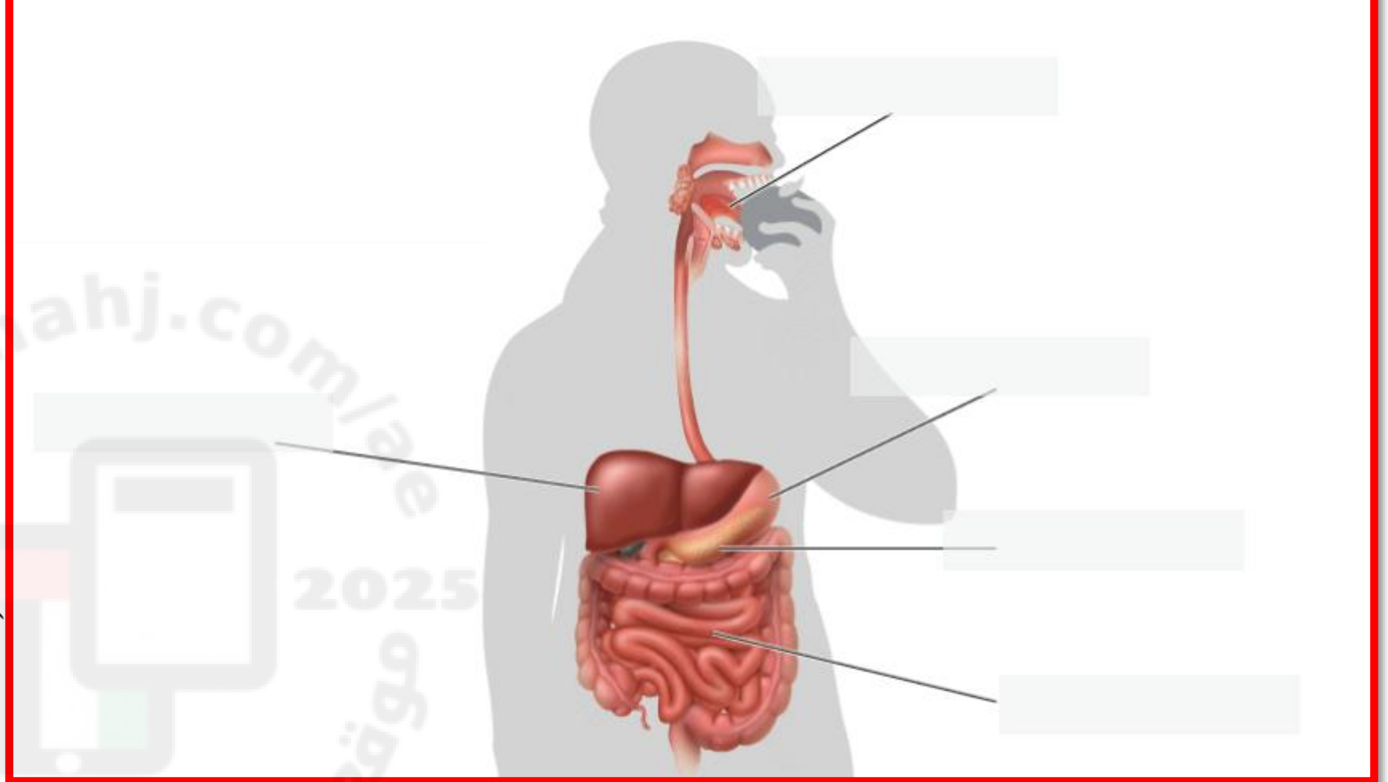


Figure 2 The human digestive system is made up of numerous parts, including the esophagus, which extends from the pharynx to the stomach and is approximately **25 cm** long.

Place the labels on to the correct structures of the digestive system.



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15. Feces are temporarily stored in the:

a) Colon b) Appendix c) Rectum d) Gallbladder

16. Which of the following best explains the difference between mechanical and chemical digestion?

a) Mechanical digestion involves enzymes, chemical digestion involves chewing.

b) Mechanical digestion breaks food into smaller pieces; chemical digestion breaks molecules using enzymes.

c) Both processes are identical.

d) Mechanical digestion happens only in the stomach, chemical only in the small intestine.

17. Which organ produces enzymes that digest carbohydrates, proteins, and fats?

a) Liver b) Pancreas c) Gallbladder d) Stomach

18. Why does the stomach produce mucus?

a) To aid absorption of glucose

b) To neutralize bile salts

c) To protect the stomach lining from acid and enzymes

d) To digest proteins

1. Why is peristalsis essential for the movement of food through the digestive tract?

A. It uses gravity to move food downward.

B. It relies on voluntary muscle contractions in the throat.

C. It provides rhythmic smooth muscle contractions that push food forward regardless of body position.

D. It occurs only in the esophagus to initiate swallowing.

The epiglottis prevents choking by:

a) Blocking the esophagus

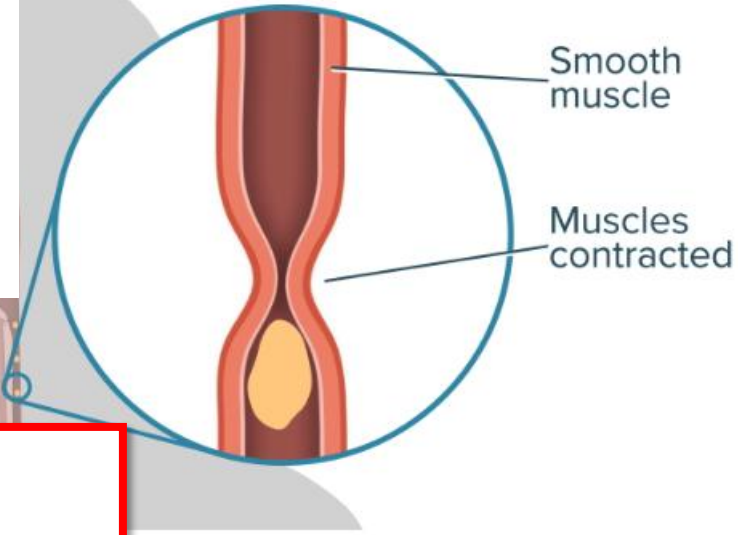
b) Covering the trachea during swallowing

c) Releasing bile

d) Absorbing food into the bloodstream

What type of digestion is shown here?

- mechanical
- enzyme
- chemical
- cardiac



Which muscular contractions push food through the digestive tract?

a) Peristalsis b) Diffusion c) Segmentation d) Filtration

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a) Mechanical digestion involves enzymes, chemical digestion involves chewing.

b) Mechanical digestion breaks food into smaller pieces; chemical digestion breaks molecules using enzymes.

c) Both processes are identical.

d) Mechanical digestion happens only in the stomach, chemical only in the small intestine.

The epiglottis plays a vital role during swallowing because—

A. it prevents stomach acid from entering the esophagus.

B. it covers the trachea, preventing food from entering the respiratory system.

D. it produces mucus that lubricates the throat

D. it produces mucus that lubricates the throat

The acidic environment (pH ≈ 2) of the stomach is necessary primarily to—

A. neutralize acids from the mouth.

B. enhance absorption of carbohydrates..

C. create ideal conditions for pepsin to break down proteins.

D. slow down peristalsis to allow more digestion time

Which sequence best describes how both mechanical and chemical digestion occur in the stomach?

A. Acid neutralizes enzymes while muscles contract to push food..

B. The stomach lining absorbs nutrients while peristalsis continues

C. Enzymes digest starch while bile emulsifies fats.

D. Muscles churn food into chyme while enzymes and acid chemically break down proteins.

Liver and Gallbladder **Liver**: Largest internal organ in the body.

Produces **bile**, a digestive fluid that helps break down fats.
Daily bile production is significant; excess is stored in the **gallbladder**.

- **Gallbladder**:
  - Stores and releases bile into the small intestine when needed.
  - Can develop **gallstones**, which are cholesterol crystals that may block bile flow.
- **Nutrient absorption**:
  - Fingerlike projections called **villi** increase surface area (~same as a tennis court).
  - Nutrients absorbed into the bloodstream via villi.

- **Chyme**: After digestion, semi-liquid food (**chyme**) moves into the **large intestine**, consisting of materials not absorbed by villi. Large Intestine

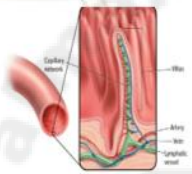
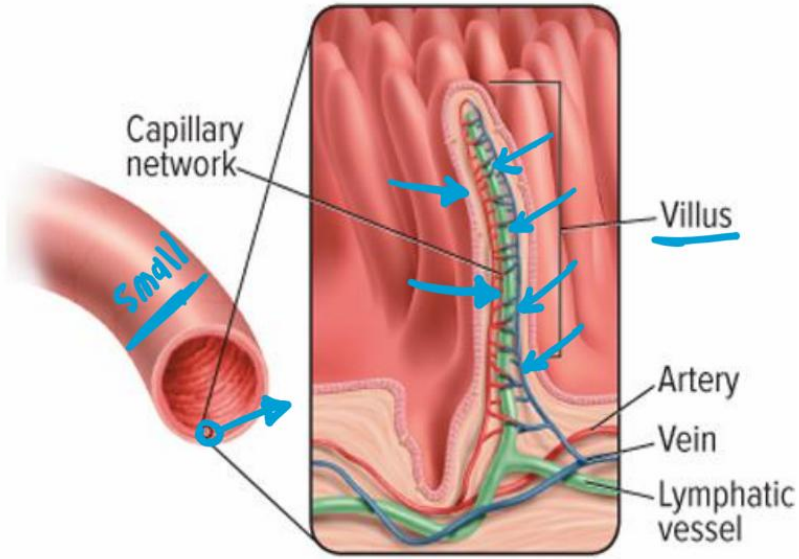


Figure 6 A villus is a fingerlike extension of the lining of the small intestine. Nutrients diffuse into capillaries in the villi and reach body cells by means of circulating blood.

- **Structure**: End portion of the digestive tract; includes:
  - **Colon**: Main section; absorbs water and some minerals from chyme.
  - **Rectum**: Stores feces until elimination.
  - **Appendix**: Small sac-like appendage with no known function.

What is the function of this structure?



- releases amylase
- performs peristalsis
- absorbs nutrients in small intestine
- releases bile

organ	Mechanical digestion	Chemical digestion
Mouth	Chewing by teeth- churning food	Saliva that contain Amylase that digest Starch
Stomach	Muscles of stomach	Pepsin (protein) Gastric juice Stomach acid – (PH=2)
Small intestine	Peristalsis	Bile from liver digest fats Pancreatic juice (carbohydrates, proteins, fats)

25. Which nutrient begins digestion in the mouth?
a) Proteins b) Fats c) Carbohydrates d) Vitamins
26. Which of the following explains why peristalsis allows swallowing upside down?
a) It uses gravity
b) It depends on voluntary muscles only
c) It is driven by rhythmic contractions of smooth muscle
d) It stops when food moves against gravity
27. Which digestive organ produces both enzymes and hormones?
a) Stomach b) Pancreas c) Liver d) Gallbladder
28. What is the correct order of food passage?
a) Mouth → Stomach → Esophagus → Intestines
b) Mouth → Pharynx → Esophagus → Stomach → Small intestine → Large intestine → Rectum
c) Esophagus → Mouth → Stomach → Small intestine → Rectum
d) Pharynx → Stomach → Mouth → Large intestine
29. The appendix is considered a vestigial structure because:
a) It produces bile b) It stores feces
c) It has no known essential digestive function d) It digests fats
30. Which substance raises the pH of chyme when it enters the small intestine?
a) Hydrochloric acid b) Pancreatic alkaline fluid
c) Bile salts d) Saliva
31. Which is absorbed directly into the stomach lining?
a) Proteins b) Fats c) Alcohol and aspirin d) Starch

31. Which is absorbed directly into the stomach lining?
a) Proteins b) Fats c) Alcohol and aspirin d) Starch
32. Why does food become chyme in the stomach?
a) Peristalsis mixes it with gastric juice b) Villi absorb it completely
c) Bile emulsifies it d) Pepsin neutralizes it
33. Which bacterial function in the colon benefits humans?
a) Producing bile b) Producing vitamin K and B vitamins
c) Breaking down alcohol d) Storing starch
34. A blockage in the cardiac sphincter would directly prevent:
a) Chyme from entering the small intestine b) Food from entering the stomach
c) Water absorption d) Acid secretion
35. Which time frame is correct for food in the stomach?
a) 5–30 seconds b) 2–24 hours c) 3–4 hours d) 18 hours – 2 days
36. Which sphincter prevents backflow of stomach contents into the esophagus?
a) Pyloric b) Anal c) Cardiac d) Rectal
37. Which correctly matches organ to function?
a) Gallbladder – produces bile b) Pancreas – produces bile salts
c) Liver – produces bile d) Appendix – absorbs fats

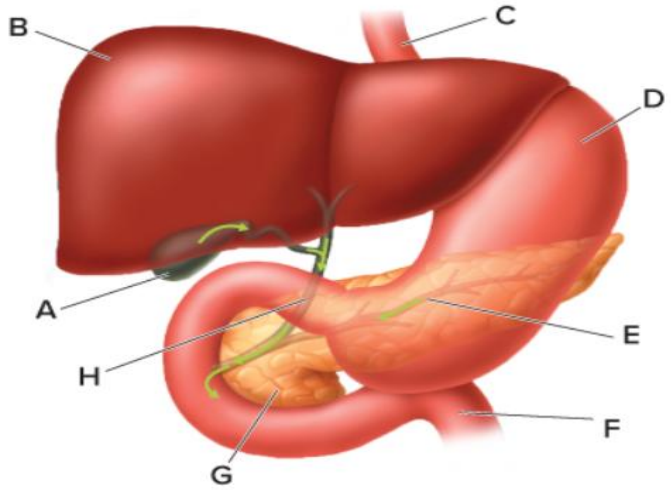
The pancreas contributes to digestion in the small intestine by—

A. storing bile until needed for fat digestion.
B. releasing acid to activate pepsin.
C. producing enzymes that break down all nutrient types and secreting an alkaline fluid to raise pH.
D. absorbing nutrients directly into the bloodstream

Why is it important for the pancreas to secrete an alkaline fluid into the small intestine?

A. It deactivates bile from the liver.
B. It raises the pH to protect intestinal walls from acid and create an environment suitable for enzymes.
C. It increases the acidity needed for protein digestion.
D. It causes the gallbladder to release bile.

Match the following terms to the correct letters (A-H).



gallbladder

stomach

esophagus

bile duct

pancreas

liver

small intestine

pancreatic duct

The liver is the largest internal organ of the body and produces bile, which helps to break down fats. About 1 L of bile is produced every day, and excess bile is stored in the gallbladder to be released into the small intestine when needed. **Figure 5** shows gallstones, which are cholesterol crystals that can form in the gallbladder.

Figure 5 Gallstones can obstruct the flow of bile from the gallbladder. Gallstones can be removed through surgery.

Chemical digestion is completed and most of the nutrients from food are absorbed from the small intestine into the bloodstream through fingerlike structures called **villi** (VIH li) (singular, villus). Villi, shown in **Figure 6**, increase surface area, giving the small intestine approximately the same surface area as a tennis court.

Refer again to **Figure 1** and **Figure 2** to follow the movement of digested food through the digestive system. Once digestion is complete, the remaining food, now in a semiliquid form called chyme (KIME), moves into the large intestine. Chyme is made up of materials that cannot be digested or absorbed by villi in the small intestine.

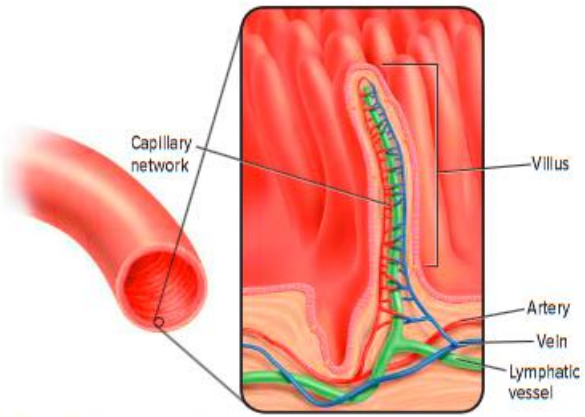


Figure 6 A villus is a fingerlike extension of the lining of the small intestine. Nutrients diffuse into capillaries in the villi and reach body cells by means of circulating blood.

STUDY TIP

Sequence and Order Using your notes, work with a partner to review the functions of the organs in the digestive system. Ask questions of one another for deeper learning.

CCC CROSSCUTTING CONCEPTS

Systems and Systems Models With a partner, review the information about the structures of the digestive system. Then, work with your partner to develop a model, such as a flow chart, to describe how matter flows within the digestive system.

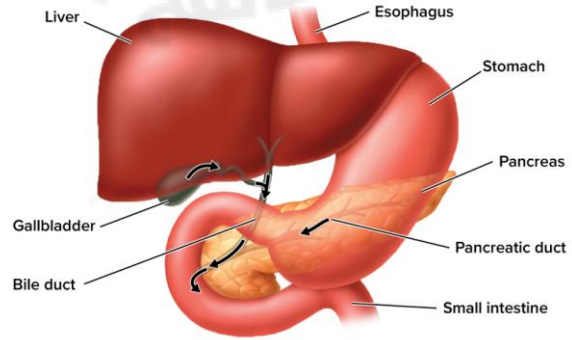
- **Function**: Absorbs water from semi-liquid chyme, turning it into **feces**.
- Contains beneficial bacteria that produce **vitamin K** and some **B vitamins**.
- **Peristalsis** continues to move feces toward the rectum.
- Stretching of rectal walls triggers reflex to relax the **anal sphincter**, allowing elimination of feces.

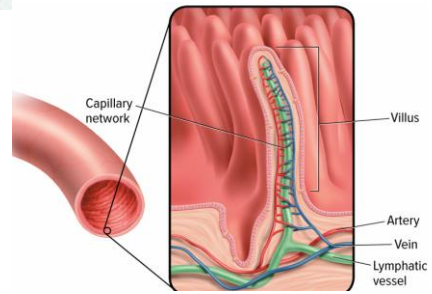
Figure 5 Gallstones can obstruct the flow of bile from the gallbladder. Gallstones can be removed through surgery.

Time Food Spends in Digestive Tract

Digestive Structure	Primary Function	Time Food is in Structure
Mouth	Mechanical & chemical digestion	5–30 s
Esophagus	Transport (swallowing)	10 s
Stomach	Mechanical & chemical digestion	2–24 h
Small Intestine	Mechanical & chemical digestion	3–4 h
Large Intestine	Water absorption	18 h–2 days

8/21/25, 9:30 AM Lesson 1: The Digestive System





Which of the following is NOT a function of the digestive system?

A)ingest food B) digest food to small molecule C)absorb nutrient molecules
D) eliminate non-digestible waste E)transport nutrients to other organs

Digestion" of food refers to

A)allowing the liver to produce bile for digestion.
B)allowing the pancreas to release digestive enzymes.
C)allowing small molecules to cross cell membranes and be absorbed by the tract lining.
D)allowing large molecules to cross cell membranes and be absorbed by the tract lining.
E)allowing the meat that is eaten to nourish our body

Strictly speaking, ____ refers to the breakdown of food by enzymatic action.

A)ingestion B) digestion C) excretion D) metabolism E) mastication

Sphincters are muscles that encircle tubes and act as valves.

A)True
B)False

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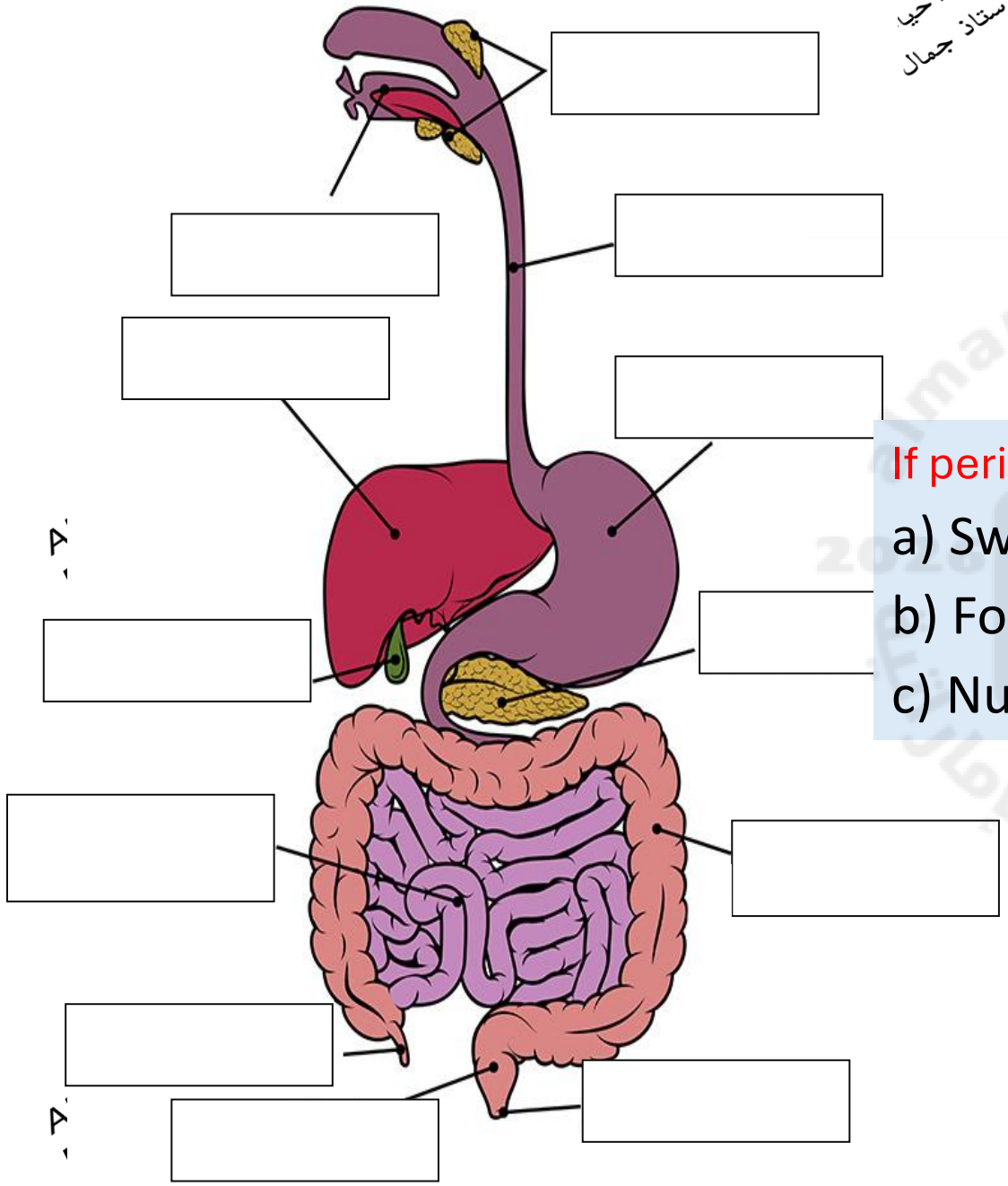


Directions: Identify the major organs of the digestive system. Write your answers inside the boxes.

Gallbladder –liver- Small Intestine - stomach-large intestine- Salivary Gland – Pancreas- Anus – Appendex – oesophagus- Rectum

If peristalsis in the esophagus is paralyzed, what happens?

a) Swallowing stops completely

b) Food cannot move into the stomach

c) Nutrient absorption decreases

d) Enzymes denature

.Which sequence best explains fat digestion?

a) Chewing → Pepsin → Absorption

b) Bile emulsification → Pancreatic lipase → Absorption in villi

c) Amylase → Pepsin → Absorption

d) Mucus → Peristalsis → Appendix

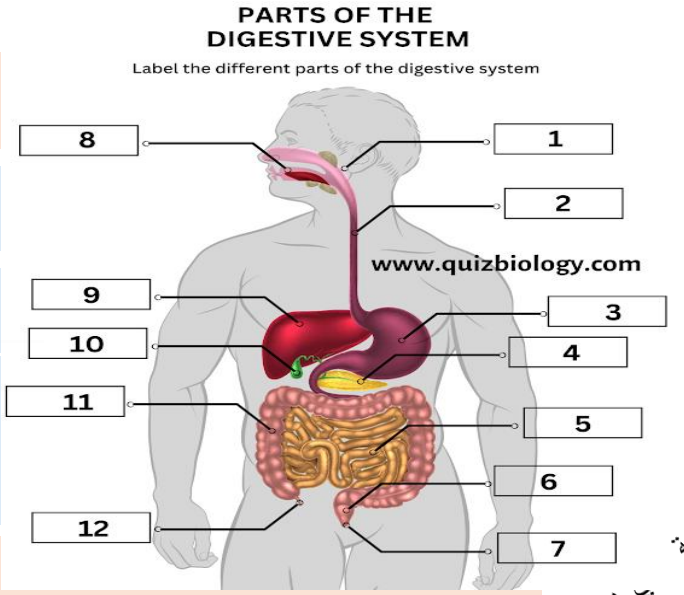
Why does food become chyme in the stomach?

a) Peristalsis mixes it with gastric juice

b) Villi absorb it completely

c) Bile emulsifies it

d) Pepsin neutralizes



Which bacterial function in the colon benefits humans?

a) Producing bile

b) Producing vitamin K and B vitamins

c) Breaking down alcohol

d) Storing starch

Which time frame is correct for food in the stomach?

a) 5–30 seconds b) 2–24 hours c) 3–4 hours d) 18 hours – 2 days?

A blockage in the cardiac sphincter would directly prevent:

a) Chyme from entering the small intestine

b) Food from entering the stomach

c) Water absorption

d) Acid secretion.

Why is the colon important for survival?

a) It produces enzymes
b) It absorbs water, preventing dehydration
c) It digests proteins
d) It stores vitamins?

Which of the following processes is both voluntary and involuntary?

a) Chewing
b) Swallowing
c) Peristalsis
d) Defecation?

Which experiment best demonstrates the time food spends in the digestive tract?

a) Measuring stomach pH
b) Tracking dye-labeled food through the system
c) Counting villi in the intestine
d) Observing bacterial activity in the colon

Which is an enzyme responsible for breaking down starches into sugars?

A. amylase
B. appendix
C. peristalsis
D. pepsin

In what type of solution is the enzyme pepsin most active?

A. acidic solution
B. buffered solution
C. gaseous solution
D. concentrated sugar solution

What type of digestion is carried out by the action of smooth muscles in the stomach and small intestine?

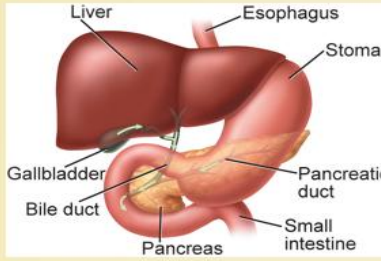
A. chemical digestion
B. mechanical digestion

What is the primary function of the large intestine?

A. absorption of water from chyme
B. chemical breakdown of feces
C. excretion of acids and hormones
D. mechanical digestion of lipids

What is the primary function of the liver?

A. produce enzymes
B. produce hormones
C. produce bile
D. produce protein



A person complaining of digestion problems is not digesting fats well. Which is a reasonable explanation for this condition?

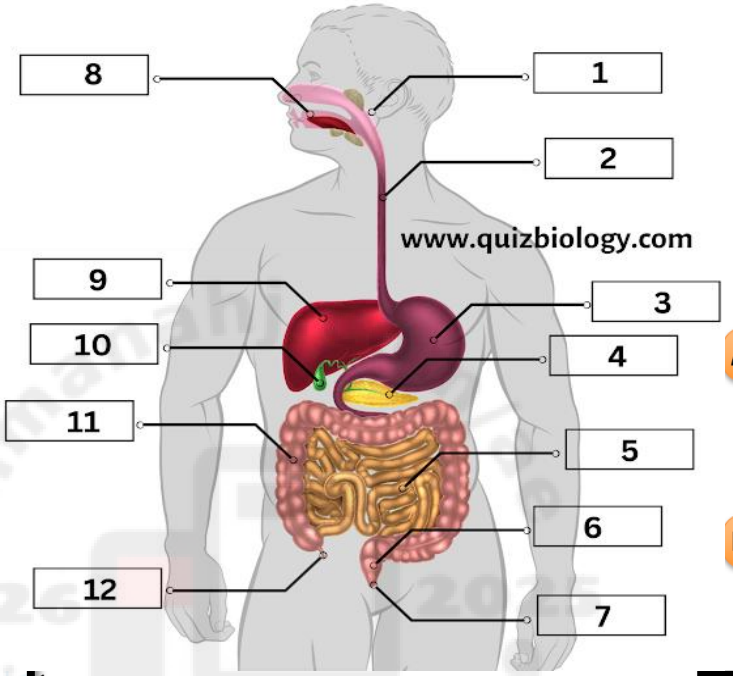
A The pyloric sphincter is blocked.
C The person is secreting excess bile.
B The bile duct is blocked.
D The stomach is secreting too much acid.

Which action takes place in the stomach?

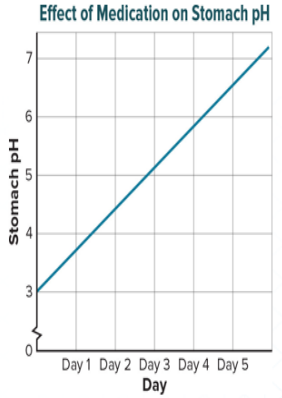
A Large fat molecules are digested into smaller molecules.
B Proteins are broken down.
C Amylase breaks down starches into smaller sugar molecules.
D Insulin is secreted for use in the small intestine.

PARTS OF THE DIGESTIVE SYSTEM

Label the different parts of the digestive system



A person has been taking a medication for 5 days. Which of the following is likely to be a consequence of this medication?



A Pepsin would not be able to break down proteins. CORRECT
C Bile would not be able to be produced.
B Amylase would not be able to break down starch.
D Enzymes secreted by the pancreas would not function well.

1. The part labeled 1 is a gland that produce saliva, moistens food and helps to break down carbohydrate is

- mouth
- stomach
- salivary glands
- small intestines

2. The muscular tube responsible for carrying food from the mouth to the stomach labeled 2 is

- mouth
- esophagus
- large intestine
- small intestine

Why does elimination occur only after rectal wall stretching?

a) Reflex relaxation of anal sphincter is triggered

c) Bile salts accumulate

d) The appendix stores feces

b) Peristalsis stops in the small intestine

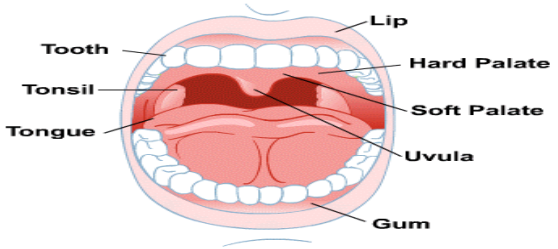
If peristalsis in the esophagus is paralyzed, what happens?

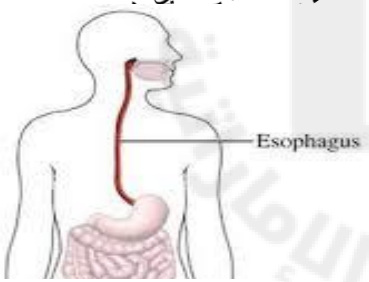
a) Swallowing stops completely

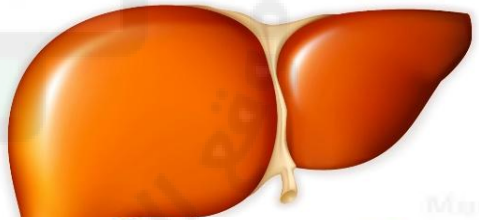
b) Food cannot move into the stomach

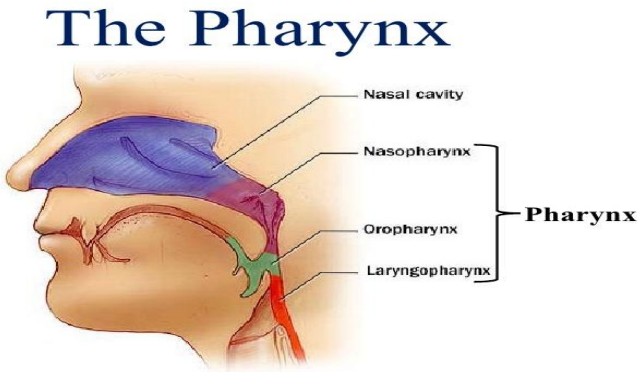
c) Nutrient absorption decreases

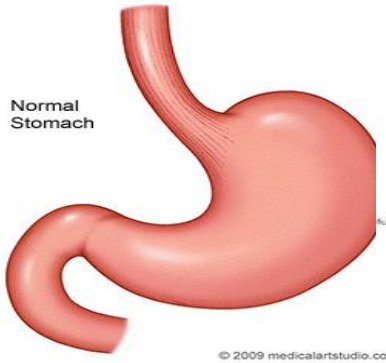
d) Enzymes denature

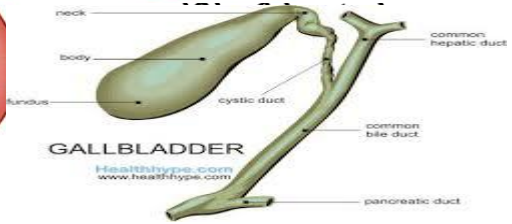


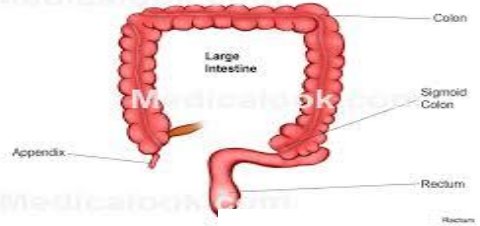


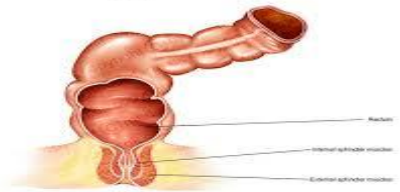












Match the following descriptions to the correct organ of the digestive system.

Description	Organ
The pH of this organ is about 2.	Stomach
This organ uses villi to absorb nutrients into the bloodstream.	Liver
This organ absorbs water from the chyme.	Large intestine
The pH of this organ is about 7.	Oesophagus
This organ moves food from the mouth to the stomach.	Small intestine
This organ uses the enzyme pepsin to break down proteins.	
This organ helps create and eliminate feces.	

Which is the primary function of the colon?

- ○ completing mechanical digestion
- ○ absorbing water from chyme
- ○ completing chemical digestion
- ○ absorbing nutrients from chyme

Liver cells accelerate the process of turning glucose into glycogen when signaled by the hormone insulin

FALSE **True**

LESSON 2

NUTRITION

FOCUS QUESTION

Nutrition is the process of **taking in and using food** to obtain energy and materials for growth, repair, and maintenance of the body.

- **Foods** supply both **building blocks** (nutrients) and **energy** to maintain body mass

Energy Balance The energy input (Calories consumed) should equal the energy output (Calories used) each day.

If intake > output → weight gain. If intake < output → weight loss.

What is a Calorie? 🔥 A Calorie (uppercase C) is a unit of energy used to measure the energy content of food.

1 Calorie (food Calorie) = 1 kilocalorie (kcal) = 1,000 calories (lowercase c)

1 calorie = amount of heat needed to raise 1 gram of water by 1°C

Different nutrients provide different energy amounts: 1 g carbohydrate = 4 Calories

1 g protein = 4 Calories

1 g fat = 9 Calories

Lesson 2: Nutrition

1.Which of the following best defines nutrition?

A) The process of breaking down food into energy
B) The process of taking in and using nutrients
C) The study of diseases
D) The process of excretion

2.Which nutrient provides the body with energy?

A) Vitamins
B) Minerals
C) Carbohydrates
D) Water

3. Why is a balanced diet important?

A) It prevents all diseases
B) It maintains homeostasis and supports body functions
C) It helps only in digestion
D) It provides more calories

4.Which of the following is NOT considered a nutrient?

A) Protein
B) Fat
C) Oxygen
D) Carbohydrate

5. What might result from long-term poor nutrition?

A) Improved metabolism
B) Stronger immune system
C) Increased risk of diseases
D) Better growth

6.Which factor most influences dietary habits across cultures?

A) Genetic code
B) Cultural and environmental conditions
C) Type of blood
D) Body temperature

What does a Calorie (uppercase C) measure?

A. The amount of water in food

B. The amount of heat needed to raise 1 liter of water by 1°C

C. The energy content of food, equal to 1,000 small calories

D. The weight of food per gram

Which statement best describes the relationship between calories consumed and calories used?

A. Weight increases when calorie use equals intake.

B. Weight decreases when intake exceeds use.

C. Weight remains stable when intake equals use.

D. Weight gain occurs when more calories are burned than consumed.

Why does fat contain more energy per gram than carbohydrates or proteins?

A. It is broken down more slowly by the body.

B. B. It has more carbon–hydrogen bonds that release energy when broken.

C. It contains water that stores energy.

D. It is stored in muscle tissue.

If a student eats a snack with 10 g of fat and 20 g of carbohydrates, how many Calories are provided (approx.)?

A. 40 B. 90 C. 130 D. 170

Which is the number of calories needed to raise 10 mL of water 10°C?

A. 10 B. 1 C.100 D. 100

Carbohydrates are major energy-providing nutrients found in foods like cereal, pasta, rice, potatoes, and fruits.

Simple carbohydrates (e.g., glucose, fructose, sucrose) are sugars found in fruits, soda, and candy. They give quick energy.

Complex carbohydrates (e.g., starches) are long chains of sugars found in foods like bread, pasta, and vegetables. They provide long-term energy.

During digestion, complex carbohydrates are broken down into simple sugars.

These simple sugars. provide long-term energy.

These simple sugars are absorbed through the villi in the small intestine into the bloodstream, where they are used by cells for energy.

Extra glucose is stored in the liver as glycogen for later use.

Cellulose (dietary fiber) is a complex carbohydrate from plant foods such as bran, beans, and whole grains.

Although humans cannot digest fiber, it is essential because it keeps food moving through the digestive system and helps remove wastes.

Carbohydrates

Cereal, pasta, potatoes, strawberries, and rice all contain a high proportion of carbohydrates. Recall that sugars, such as glucose, fructose, and sucrose, are simple carbohydrates that are found in fruits, soda pop, and candy. Complex carbohydrates are macromolecules such as starches, which are long chains of sugars. Foods such as those in **Figure 7** have a high starch content, as do some vegetables.

Figure 7 Your body needs carbohydrate-rich foods like these every day.

Complex carbohydrates are broken down into simple sugars in the digestive tract. Simple sugars are absorbed through villi in the small intestine into the bloodstream and circulated throughout the body to provide energy for cells. Excess glucose is stored in the liver in the form of glycogen. Cellulose, sometimes called dietary fiber, is another complex carbohydrate found in plant foods. Although humans cannot digest fiber, it is important because fiber helps keep food moving through the digestive tract and helps with the elimination of wastes. Bran, whole-grain breads, and beans are good sources of fiber.

Get It?
Identify examples of carbohydrates shown in the photo at the beginning of the module.

Fats

In proper amounts, fats are an essential part of a healthful diet. Fats are the most concentrated energy source available to the body, and they are building blocks for the ostasis by provid-
r, not all fats are

gure 8 The oils here are sources of saturated fat. The butter is a source of turated fat.

bined to form
ken down into
and circulated in

Fats are an essential part of a healthy diet when consumed in proper amounts

They are the most concentrated source of energy and serve as building blocks for the body

Fats protect internal organs, help maintain homeostasis, and aid in storing and transporting certain vitamins (like A, D, E, and K).

Not all fats are beneficial — they are classified by their chemical structure into saturated and unsaturated fats

Saturated fats are mainly found in meat, cheese, and dairy products; they are solid at room temperature and can raise cholesterol levels, increasing the risk of heart disease.

Unsaturated fats come mainly from plants (like olive oil); they are liquid at room temperature and are healthier for the heart.

During digestion, fats are broken down in the small intestine **into fatty acids and glycerol**, which are absorbed through the villi and circulated in the blood for energy and body functions.

1.Which of the following is a simple carbohydrate? A) Starch B) Glucose C) Cellulose D) Glycogen

2.Complex carbohydrates are mainly found in: A) Candy B) Whole grains C) Butter D) Meat

3. What happens to carbohydrates during digestion?

A) They are converted into amino B) They are broken down into glucose

C) They remain unchanged D) They become fats directly

4.Which carbohydrate cannot be digested by humans but is important for health?

A) Fiber B) Glucose C) Starch D) Glycogen

5. Which of the following carbohydrates provides the slowest energy release?

A) Sucrose B) Fructose C) Starch D) Glucose

6.What could be a long-term effect of a low-fiber diet?

A) Improved digestion B) Constipation and digestive issues C) Faster metabolism D) Stronger muscles

1.Fats are important because they:

A) Provide energy and protect organs B) Form bones C) Produce oxygen D) Store water

2. Which Fats are important because they:

A) Provide energy and protect organs B) Form bones C) Produce oxygen D) Store water

3. Which of the following is an example of unsaturated fat? A) Butter B) Olive oil C) Cheese D) Lard

4. Saturated fats are usually:

A) Liquid at room temperature B) Solid at room temperature C) Found only in plants D) Non-energy sources

4.Diets high in saturated fats can cause: A) Better muscle growth B) High cholesterol and heart problems

C) Increased flexibility D) Weight loss

5. How does the body use stored fat? A) It converts fat to glucose for energy B) It releases fat through the skin

C) It changes fat to minerals D) It burns fat in the kidneys

6.A completely fat-free diet could reduce:

A) Enzyme activity B) Hormone production C) Blood sugar D) Protein absorption

Which statement best explains why complex carbohydrates are considered a better energy source than simple sugars?

A. They are absorbed faster, providing quick bursts of energy

B. They contain fewer Calories per gram than simple sugars

C- They break down more slowly, releasing energy steadily over time.

D- They cannot be digested, so they prevent energy spikes.

When excess glucose is present in the body, what process occurs in the liver

A. It is broken down into amino acids

B-It is eliminated through the large intestine.

C- It is converted into glycogen for storage.

D. It is converted into cellulose for structural use.

Why is cellulose (dietary fiber) important for the digestive system, even though it cannot be digested by humans?

A. It provides enzymes needed for digestion..

B. It supplies essential nutrients to the bloodstream

C. It helps move food through the digestive tract and aids elimination..

D. It increases energy absorption in the small intestine.

Which of the following foods would be the best source of complex carbohydrates?

A. Candy and soda

B. Strawberries and apples

C. Pasta and rice

D. Milk and cheese..

Which of the following best explains why unsaturated fats are generally liquid at room temperature?

A. They contain single carbon-carbon bonds that increase rigidity.

B. They have double bonds that create kinks preventing tight packing.

C. They are chemically bound to water molecules.

D. They contain more hydrogen atoms per carbon atom than saturated fats

What is the primary advantage of unsaturated fats compared to saturated fats in human nutrition?

A. They supply more energy per gram.

B. They increase cholesterol levels to build cell membranes.

C. They reduce the risk of cardiovascular diseases.

D. They solidify easily to store energy in tissues

Proteins

You have learned that proteins are basic structural components of all cells. Enzymes, hormones, neurotransmitters, and membrane receptors are just a few important proteins in the body.

During digestion, proteins are broken down into amino acids. The amino acids are absorbed into the bloodstream and carried to various body cells. These body cells recombine and reassemble the amino acids into proteins needed for body structures and functions.

Figure 9 Beans and rice can be combined to provide all the essential amino acids.

The human body can produce 12 of the 20 amino acids needed for cellular function. Essential amino acids are the eight amino acids that the body cannot produce, and must be included in a person's diet. Animal products, such as eggs and fish, are sources of all eight essential amino acids. Vegetables, fruits, and grains contain amino acids, but very few single plant food sources contain all eight essential amino acids. Certain combinations of plant foods, such as the beans and rice shown in **Figure 9**, provide all of the essential amino acids.

MyPlate

In 2011, the United States Department of Agriculture published a new nutrition guide, MyPlate, shown in **Figure 10**. MyPlate emphasizes the ratios of food groups rather than exact serving sizes. It recommends that a person eat about 30 percent grains, 30 percent vegetables, 20 percent fruits, 20 percent protein, with a small side of dairy such as a yogurt cup or glass of skim milk.

Figure 10 MyPlate can help you choose the foods and their amounts that are right for you.

Proteins are broken-down to (Amino Acids)

1. basic structural components of all cells.
2. Enzymes, hormones, neurotransmitters.
3. membrane receptors
4. Form muscles
5.-body structure and functions

Amino Acids(20)

1- Essential (8) body cannot produce and must be included in a person's diet. Animal products, such as eggs and fish, and plant products such grains and fruits.

2- Nonessential (12) human body can produce for calluses

Fats are broken to (Fatty acid + Glycerol)

1-the most concentrated energy source available to the body, .1

2. they are building blocks for the body. 3. protect some internal organs 4. help maintain homeostasis by providing energy and by 5. storing and transporting certain vitamins.

Complex carbohydrates are broken down into simple sugars in the digestive tract. Simple sugars these every day. are absorbed through villi in the small intestine into the bloodstream and circulated throughout the body to provide energy for cells.

Cellulose(fiber) helps keep food moving through the digestive tract and helps with the elimination of wastes.in (Bran,whole,beans)

How do fats help maintain homeostasis in the human body?

A. By lowering internal temperature

B. By providing insulation, protecting organs, and storing vitamins.

C. By stimulating muscle contraction.

D. By increasing heart rate to circulate nutrients faster.

Which type of fat is most likely to increase cholesterol levels and heart disease risk?

A- Unsaturated fat B. Saturated fat C. Trans fat D- . Polyunsaturated fat

Fats are broken down into which basic components during digestion?

A. Amino acids and peptides B. Fatty acids and glycerol . C. Nucleotides and bases. D- Glucose and starch

Which statement best explains why complex carbohydrates are considered a better energy source than simple sugars?

A. They are absorbed faster, providing quick bursts of energy B. They contain fewer Calories per gram than simple sugars

C- They break down more slowly, releasing energy steadily over time. D- They cannot be digested, so they prevent energy spikes.

What is broken down into sugars and absorbed into blood in the small intestine?

Fats carbohydrates Proteins acids

A Calorie is the unit used to measure the energy content of foods.

A. TRUE B- FALSE

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1.Proteins are made up of:

A) Fatty acids B) Amino acids C) Sugars D) Vitamins

2.Which food contains all essential amino acids?

A) Rice B) Beans C) Eggs D) Apples

3. What are essential amino acids?

A) Amino acids that can be made by the body B) Amino acids that must come from food

C) Amino acids found only in plants D) Amino acids used only for energy

4.What happens to proteins during digestion?

A) They are turned into sugars B) They are broken down into amino acids

C) They become fat molecules D) They evaporate

5. Protein deficiency mainly affects:

A) Eye color B) Hormone and enzyme production

C) Skin pigmentation D) Blood type

6.Which plant food combination provides all essential amino acids?

A) Rice and beans B) Bread and butter C) Corn and milk D) Potato and tomato

Vitamins and Minerals

Vitamins are organic compounds that are needed in small amounts for metabolic activities. help enzymes function properly

Some vitamins are produced within the body. Vitamin D is made by cells in your skin.

- Some B vitamins and vitamin K are produced by bacteria living in the large intestine.
- However, sufficient quantities of most vitamins cannot be made by the body,
- but a well-balanced diet can provide the vitamins that are n

Minerals are inorganic compounds used by the body as building materials, and they are involved with metabolic functions.

iron is needed to make hemoglobin.

Calcium, another mineral, is an important component of bones.

Sometimes people suffer from a vitamin or mineral deficiency, meaning they do not get enough of the vitamin or mineral to maintain homeostasis. For example, children who do not get enough vitamin D can suffer from rickets, a disorder in which the bones are soft and do not develop properly. People who do not get enough iodine may develop problems with their thyroid.

Figure 11 Vitamins and minerals can be taken as supplements to vitamins and minerals obtained in food.

STEM CAREER Connection

Chef

Do you enjoy preparing healthful and delicious foods? Do you understand the science of cooking? You might want to think about becoming a chef. A chef might plan menus, oversee other workers, or prepare foods. Many chefs work in restaurants, but some work in hospitals, nursing homes, or other facilities where food is served.

CCC CROSSCUTTING CONCEPTS

Energy and Matter With a small group, discuss evidence of how the energy and matter in food is used by the body. Write a bulleted list that summarizes the main points of your group's discussion.

Vitamin	Major Role in the Body	Possible Sources	Mineral	Major Role in the Body
A	• Vision • Health of skin and bones		Ca	• Strengthening of teeth and bone • Nerve conduction • Contraction of muscle
D	• Health of bones and teeth		P	• Strengthening of teeth and bones
E	• Strengthening of red blood cell membrane		Mg	• Synthesis of proteins
Riboflavin (B_2)	• Metabolism		Fe	• Synthesis of hemoglobin
Folic Acid	• Formation of red blood cells • Formation of DNA and RNA		Cu	• Synthesis of hemoglobin
Thiamine	• Metabolism of carbohydrates		Zn	• Healing of wounds
Niacin (B_3)	• Metabolism		Cl	• Balance of water
Pyridoxine (B_6)	• Metabolism of amino acids		I	• Synthesis of thyroid hormone
B_{12}	• Formation of red blood cells		Na	• Nerve conduction • Balance of pH
C	• Formation of collagen		K	• Nerve conduction • Contraction of muscle

1.Vitamins are: A) Inorganic compounds B) Organic compounds needed in small amounts
C) Made of proteins D) Energy molecules

2.Which mineral is needed to make hemoglobin? A) Iron B) Calcium C) Zinc D) Sodium

3. Fat-soluble vitamins are stored in: A) Bones B) Liver and fatty tissues C) Muscles D) Blood plasma

4.Water-soluble vitamins must be:

A) Stored in the body B) Taken regularly in food C) Avoided completely D) Produced by the skin

5. Vitamin D deficiency can cause: A) Rickets B) Anemia C) Obesity D) Dehydration

6.Taking too many vitamin supplements can be:

A) Harmless B) Dangerous without medical advice C) Always beneficial D) Recommended daily

7. Nutrition labels are required on:

A) All fresh fruits B) Commercially packaged foods C) Restaurant menus only D) Bottled water only

8.The % Daily Value on a label shows:

A) How much food to eat B) How much a nutrient contributes to a daily diet
C) The price per serving D) The total calories in food

9.Which nutrients should be consumed in moderation according to labels?

A) Vitamins and minerals B) Fat and sodium C) Protein and fiber D) Calcium and iron

9. What is one purpose of nutrition labels?

A) To compare nutrient content of foods B) To show expiration dates
C) To list cooking steps D) To show food colors

11. What could happen if food labels are misleading?

A) Consumers make unhealthy choices B) Food becomes cheaper C) Nutrients increase
D) Calories decrease

10.Reading food labels helps consumers to:

A) Maintain a balanced diet B) Ignore calorie intake C) Eat more processed food D) Avoid natural products

Why is it essential to eat proteins even though the body produces them?

A- The body makes only 12 of the 20 necessary amino acids.
B- Only digested proteins can function in cells.
C- The body only makes harmful proteins.
D- Proteins made in the body are not composed of amino acids.

Which vitamin is correctly matched with its role in the body?

A) Vitamin A -- needed to make red blood cells
B) Vitamin D -- needed to make clotting proteins
C) Vitamin K -- needed for vision
D) Vitamin C -- needed to form collagen

What is broken down into Amino Acid and absorbed into blood in the small intestine?

Fats carbohydrates Proteins acids

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The large intestine functions to

A) absorb nutrients.
B) absorb water.
C) absorb electrolytes.
D) B and C, but not A.
E) A, B, and C

If our bodies are unable to produce some amino acids, nutritionists call them _____?

A) essential fatty acids
B) essential proteins
C) essential amino acids
D) incomplete sources

What are the water soluble vitamins?

A) A, K, C
B) A, C, B
C) A, D
D) C, B

Nutrients

a. include carbohydrates, proteins, lipids, and water.
b. are needed for energy, building materials, and control of body processes.
c. include chemical elements like calcium and potassium.
d. all of the above

Chyme is produced in the--

small intestine.
stomach.
esophagus.
large intestine.

Which nutrient is primarily needed to build parts of your body like skin and muscles?

a. Carbohydrates b .Proteins c .Vitamins d .Mineralse

Which nutrient is primarily needed to build parts of your body like skin and muscles?

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A. Vitamins

Which mineral is NOT correctly matched with its role in the body?

A) calcium -- needed for strong bones and teeth

B) iron -- needed to make hemoglobin

C) iodine -- needed to make thyroid hormone

D) sodium -- needed to prevent anemia

Why is it essential to eat proteins even though the body produces them?

A) Only digested proteins can function in cells.

B) The body only makes harmful proteins.

C) Proteins made in the body are not composed of amino acids

D) The body makes only 12 of the 20 necessary amino acids.

_____is contained in pancreatic juice to neutralize the acidity of chyme from the stomach.

- Sodium bicarbonate
- Trypsin
- Pancreatic amylase
- Bile

Figure 12 When you read a nutrition label, notice how many servings are in each food container. The percent daily values are based on an individual serving, not the entire package.

Nutrition Labels

Nutrition labels are provided on commercially packaged foods like those shown in **Figure 12**. These labels are based on a 2000 Calorie per day diet. Labels can be especially useful for monitoring fat and sodium intake, which are two nutrients that need to be consumed in moderation. The FDA requires that food labels list the following information:

- name of the food
- the net weight or volume
- the name and address of manufacturer, distributor, or packager
- the ingredients

Nutrition Labels

that food labels list the following information:

- name of the food
- the net weight or volume
- the name and address of manufacturer, distributor, or packager
- the ingredients
- nutrient content

Which one of the following combinations of food groups and nutrients is incorrect?

butter and milk – fat- **Rice and bread – carbohydrates** **fish and meat** **protein cheese and eggs - vitamins**

Which of the following best describes vitamins?

A. Inorganic compounds needed in large quantities
B. Organic compounds needed in small quantities for metabolism
C. Proteins that act as enzymes
D. Elements that form cell membranes

The undigested material in the large intestines becomes . .....
Calcium and iron found in the body are called .
a) Vitamins
b) Carbohydrates
c) Minerals
d) proteins

Which vitamin can be synthesized by human skin cells when exposed to sunlight?

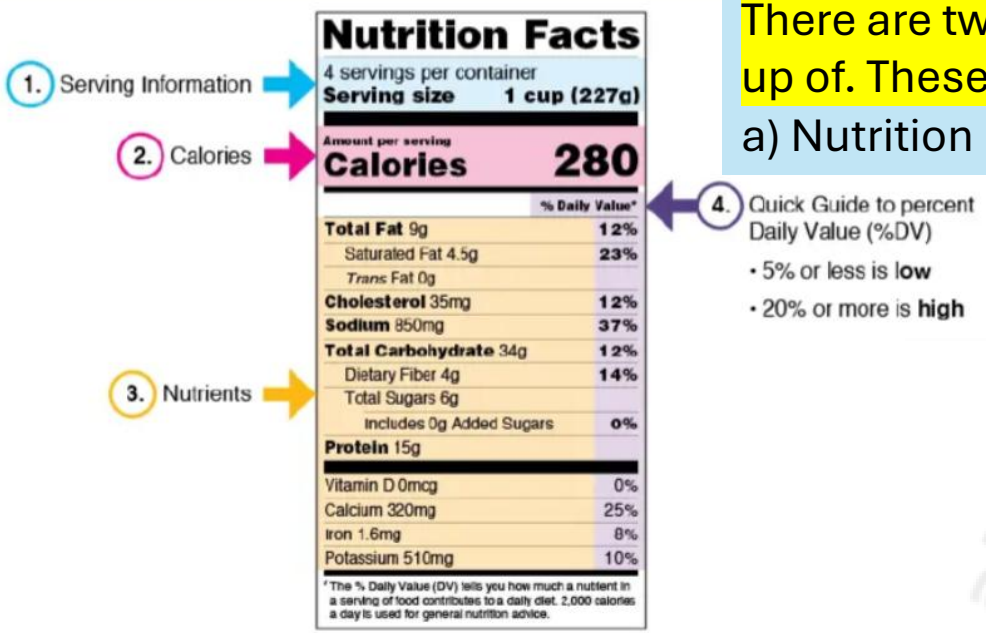
A. Vitamin A B. Vitamin B C. Vitamin D D. Vitamin K

The bacteria in the large intestine are responsible for producing which vitamins?

A. Vitamin C and D
B. Vitamin A and E
C. Vitamin K and some B vitamins
D. Vitamin D and calcium

There are two important labels used to let consumers know what the food item is made up of. These two labels are _____

a) Nutrition Facts Label b) Ingredients List c) Allergy Labels d) A and B



Examine the following nutrient labels and answer the questions.

a. How many calories would you consume if you ate the wholebox of crackers in one sing? _____

b. If you ate 2 servings of crackers, how many Milligrams of sodium would you consume? _____

. If you ate 15 crackers what would be the total calories consumed? _____

What is the vitamin that has the most important functions Metabolism of carbohydrates?

Niacin B 3 Thiamine Folic Acid Riboflavin

What is the vitamin that has the most important functions Formation of red blood cells Formation of DNA and RNA ?

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What is the vitamin that has the most important functions Metabolism ?

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While most of the human body has a pH of about 7.4, the pH of the stomach is around 2,due to the presence of HCl. How is such a low pH beneficial to digestion?

A) A low pH is necessary to convert pepsinogen to pepsin.
B) A low pH is necessary to convert trypsinogen to trypsin.
C) Killer cells of the immune system are inactivated by HCl.
D) Salty conditions are needed to separate fatty acids.

A student in the cafeteria eats nothing but a giant plate of French fries every day and explains that he is "going vegetarian." What's wrong with this diet?

A) does not contain the 8 essential amino acids
B) does not contain sufficient fiber
C) does not contain a variety of vitamins and minerals
D) all of the above

The wall of the small intestine is lined with projections called villi. Each of these projections is covered with epithelial cells that themselves have projections, microscopic extensions called microvilli. How would these projections aid in performing the function of the small intestine?

A) by increasing the surface area available for absorption of digested nutrients
B) by increasing the number of muscle fibers needed to churn food in the intestine
C) by blocking the absorption of harmful bacteria into the bloodstream
D) by blocking the release of sodium bicarbonate and preventing the neutralization of the chyme

Salivary glands secrete saliva, which contains the enzyme _____This enzyme digests _____into simple sugars

(A) Salivary amylase, protein
(B) Salivary amylase, starch
(C) Pepsin, protein
(D) Pepsin, starch

What is the main function of the mucus in the stomach

(A) It kills bacteria that get ingested with food.
(B) It protects the stomach wall from the corrosive effects of HCl.
(C) It helps in digestion of proteins in the stomach.
(D) It helps in the breakdown of fats.

Which of the following statements about villi are true? Choose 2 answers:

(A) Villi are finger-like projections found on the inner lining of the small intestine. (B) Villi secrete digestive enzymes.

(C) Villi decrease the surface area of the small intestine. (D) Villi are richly supplied with blood vessels.

Which digestive enzyme needs a highly acidic environment to function?

(A) Salivary amylase (B) Pepsin (C) Trypsin

Which of the following is NOT a function of a balanced diet?

- Providing energy
- Helping to build and repair tissues
- Causing nutrient deficiencies
- Supporting overall health

A can of Chicken Breast is 210 calories. There are 3.5 servings per can. If you eat one serving, how many calories have you consumed?

60 125 690 210 75

What is the vitamin that has the most important functions Vision Health of skin and bones?

A D B B2

What is the vitamin that has the most important functions Health of bones and teeth?

A D B B2

What is the vitamin that has the most important functions Strengthening of red blood cell membrane?

A D B B2

What is the vitamin that has the most important functions Metabolism?

A D B B2

25. A deficiency in iron would directly affect:

A) Oxygen transport ✅ B) Bone strength C) Muscle growth D) Enzyme activity

26. Which is true about MyPlate proportions?

A) Fruits and grains are equal parts B) Protein should be the largest sectio

B) Half the plate should be fruits and vegetables ✅

D) Dairy replaces vegetables

27. Why is it not advisable to rely only on supplements?

A) They are unsafe for all people B) Excess can be toxic ✅

C) They lack minerals D) They are expensive

28. Which activity burns the most Calories per hour?

A) Baseball B) Hiking C) Soccer ✅ D) Bicycling

29. Which pair shows matching nutrient and role?

A) Vitamin D – metabolism B) Iron – hemoglobin formation ✅

C) Calcium – nerve impulse D) Fiber – vitamin storage

30. The best example of energy and matter use in the body is:

A) Energy from food converted to movement ✅ B) Water evaporation

C) Growth of nails D) Circulation of blood

Major Roles of Some Vitamins and Minerals

Vitamin	Major Role in the Body	Possible Sources	Mineral	Major Role in the Body
Thiamine	• Metabolism of carbohydrates		Zn	• Healing of wounds
Niacin (B_3)	• Metabolism of energy		Cl	• Balance of water
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