Helpers Along the Way

How accessory organs support digestion

HAP.13.3 "Identify the accessory organs (i.e., salivary glands, liver, gallbladder, and pancreas) for digestion and describe their function."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline the four accessory organs. Circle the substances they make, store, or release to help digestion.

What Happens to a Sandwich?

1. Imagine taking a bite of a peanut butter sandwich. Your teeth break it into smaller pieces, but chemical digestion also begins before you swallow. The salivary glands, located around the mouth, release saliva into it. Saliva moistens the bread so it is easier to swallow. It also contains amylase, an enzyme that begins breaking down starch in the bread into smaller sugar molecules. Salivary glands are accessory organs: they help digestion, but food does not pass through them. After swallowing, the food travels through the digestive tract toward the stomach and small intestine.

2. The sandwich's peanut butter contains fat. When partly digested food moves from the stomach into the small intestine, bile helps prepare that fat for digestion. The liver produces bile, a fluid that breaks large fat globules into tiny droplets. This action is called emulsification, and it gives digestive enzymes more surface to work on. Bile is not a digestive enzyme and does not itself break fat molecules into smaller chemical parts. The gallbladder stores and concentrates bile made by the liver. When food containing fat reaches the small intestine, the gallbladder releases bile into that intestine.

3. Another accessory organ, the pancreas, sends digestive juices into the small intestine. Its enzymes act on several kinds of nutrients: pancreatic amylase helps break down starch, proteases break down proteins, and lipase breaks down fats. Lipase can work on the small fat droplets created by bile's action. The pancreas also releases bicarbonate, which helps neutralize acid carried from the stomach. This protects the small intestine and allows its digestive enzymes to work more effectively. Although these organs release materials into the digestive tract, the sandwich itself never travels through the pancreas, liver, gallbladder, or salivary glands.

2 ANSWER WITH EVIDENCE

Use the passage

1. Which accessory organ begins chemical digestion of the bread's starch, and what does it release?

2. How do the liver and gallbladder have different roles in getting bile to the small intestine?

3. Name two substances the pancreas releases and describe what each does.

4. A student says bile breaks down fat molecules just as pancreatic lipase does. Which organs supply these substances, and how do their effects differ?

3 YOUR TURN

Your own words

Imagine eating a baked potato topped with butter and beans. In four or five sentences, explain how all four accessory organs help digest the starch, fat, and protein in this meal, and why food does not enter those organs.

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PART 1 · READ AND MARK

Underline the four accessory organs. Circle the substances they make, store, or release to help digestion. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Which accessory organ begins chemical digestion of the bread's starch, and what does it release?	**The salivary glands release saliva containing amylase, which begins breaking down starch.**
2	How do the liver and gallbladder have different roles in getting bile to the small intestine?	**The liver makes bile. The gallbladder stores and concentrates it, then releases it into the small intestine.**
3	Name two substances the pancreas releases and describe what each does.	**For example, pancreatic lipase breaks down fats, while bicarbonate helps neutralize acid from the stomach.**
4	A student says bile breaks down fat molecules just as pancreatic lipase does. Which organs supply these substances, and how do their effects differ?	**The liver makes bile, which separates large fat globules into droplets without chemically breaking down fat molecules. The pancreas supplies lipase, an enzyme that breaks down fat molecules.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Salivary glands release saliva with amylase, which begins breaking down starch in the potato. The liver makes bile, which separates fat from the butter into small droplets. The gallbladder stores bile and releases it into the small intestine when fat arrives. The pancreas supplies enzymes that break down starch, fat, and protein, including protein from the beans. Food moves through the digestive tract rather than through these accessory organs, which send substances into the tract.

For question 3, accept any two pancreatic substances named in the passage with their correct functions. For the open task, look for distinct roles for all four organs and a clear statement that food travels through the digestive tract, not through the accessory organs.