Where Does It Go?

Trace how gland structure determines where a product acts.

HS-AP7-2 "Assess the structural and functional differences between an endocrine gland and an exocrine gland."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline descriptions of products traveling through ducts, and circle descriptions of products entering or traveling through blood. Put a star beside one sentence that explains how a delivery route fits a product's job.

Two Routes Through the Body

1. During a long bike ride, sweat beads on your forehead. Sweat glands in your skin are **exocrine glands**: clusters of secretory cells make fluid and send it through narrow ducts to pores at the skin's surface. There, evaporation helps cool you. The duct connects the gland to the place where its product acts. Sweat does not need to travel through the bloodstream to cool the skin. A blocked sweat duct can keep fluid from reaching the surface even when the secretory cells still produce it. The gland's structure therefore shapes how its product is delivered.

2. A sudden obstacle on the bike ride may trigger a different delivery system. The adrenal glands, located above the kidneys, are **endocrine glands**. They have no ducts carrying their hormones to an outside surface. Instead, secretory cells release hormones into nearby tissue fluid, and the hormones enter blood vessels. Adrenaline, also called epinephrine, travels in the blood and can affect organs such as the heart and airways. Its effects depend on target cells with suitable receptors. Unlike sweat reaching skin through a duct, this signal can reach distant tissues through circulation.

3. The pancreas shows why the delivery route matters more than an organ's name. Some pancreatic cells form endocrine clusters called islets. They release insulin into the blood, allowing it to reach target cells in places such as muscle and liver, where it helps regulate blood glucose. Other pancreatic cells make digestive enzymes. These cells form exocrine units connected to ducts that empty into the small intestine, where the enzymes help break down food. Both cell groups release substances, but only one uses ducts. To assess a gland, trace where its product enters and where that product acts.

2 ANSWER WITH EVIDENCE

Use the passage

1. Compare the structures that carry sweat and adrenal hormones away from their glands. How does each route fit where its product acts?

2. The pancreas has both endocrine and exocrine cells. Compare the routes and destinations of the two products named in the passage.

3. If a sweat duct is blocked but its secretory cells still work, what happens to the gland's cooling function? Explain using its structure.

4. Why would releasing pancreatic digestive enzymes into the blood instead of the pancreatic ducts be a poor match for their function?

3 YOUR TURN

Your own words

Imagine a desert animal needs one gland to coat its nose lining with protective mucus and another to signal distant kidney cells to conserve water. In four sentences, design and classify each gland's delivery route, then explain why switching the routes would make each job less effective.

Where Does It Go?

PART 1 · READ AND MARK

Underline descriptions of products traveling through ducts, and circle descriptions of products entering or traveling through blood. Put a star beside one sentence that explains how a delivery route fits a product's job. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Compare the structures that carry sweat and adrenal hormones away from their glands. How does each route fit where its product acts?	**Sweat travels through ducts to the skin surface, where it helps cool the body. Adrenal hormones enter the blood, which carries them to distant target cells.**
2	The pancreas has both endocrine and exocrine cells. Compare the routes and destinations of the two products named in the passage.	**Endocrine islets release insulin into blood to reach target cells in places such as muscle and liver. Exocrine cells send digestive enzymes through ducts into the small intestine.**
3	If a sweat duct is blocked but its secretory cells still work, what happens to the gland's cooling function? Explain using its structure.	**Less sweat reaches the skin surface, so evaporation cannot cool that area as effectively. The blocked duct prevents delivery even though the cells still make sweat.**
4	Why would releasing pancreatic digestive enzymes into the blood instead of the pancreatic ducts be a poor match for their function?	**The enzymes need to enter the small intestine to help break down food. The ducts deliver them there, while blood is the route described for products traveling to distant target cells.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

I would use an exocrine gland with a duct opening onto the nose lining to deliver protective mucus directly to that surface. I would use a ductless endocrine gland that releases a hormone into blood so it can reach distant kidney cells. Sending mucus into blood would not coat the nose lining. Sending the hormone through a duct onto the nose would not carry it through the blood to the kidney cells.

Accept responses that connect exocrine ducts with delivery to a surface and ductless endocrine release with blood transport to distant targets. For the open task, look for a functional reason that each route suits its destination.