Messages in Motion

Trace endocrine signals from glands to their effects.

HAP.7.2 "Discuss the function of each endocrine gland and the various hormones secreted."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline each named gland, circle its hormone or hormones, and connect each circled hormone to the words that tell what it does.

A Day of Chemical Messages

1. Before sunrise, a student's body is already passing chemical messages through the blood. Endocrine glands release hormones, which can change how distant organs work. The pineal gland releases melatonin as darkness increases, helping signal that it is nighttime. The hypothalamus makes antidiuretic hormone, or ADH; the posterior pituitary releases it into the blood, and it tells the kidneys to conserve water. The anterior pituitary releases thyroid-stimulating hormone, or TSH, which prompts the thyroid gland to release thyroid hormones. Those hormones raise the rate at which many cells use energy. Nearby parathyroid glands release parathyroid hormone, or PTH, which raises blood calcium levels when they drop.

2. At lunch, a meal sends glucose into the blood. In the pancreas, groups of endocrine cells detect that rise and release insulin. Insulin helps body cells take up glucose and helps the liver store some as glycogen. When blood glucose falls between meals, the pancreas releases glucagon, which tells the liver to release stored glucose. Later, a sudden barking dog sets off a different response. The adrenal medulla releases epinephrine, which speeds the heartbeat and prepares the body for quick action. The adrenal cortex releases cortisol during longer-lasting stress; cortisol helps maintain blood glucose and supports the body's response to stress.

3. Some endocrine signals shape changes over years rather than minutes. In the ovaries, estrogen supports the development of many female secondary sex characteristics and helps regulate the menstrual cycle. The ovaries also release progesterone, which helps maintain the uterine lining after ovulation. In the testes, testosterone supports sperm production and the development of many male secondary sex characteristics. The anterior pituitary sends follicle-stimulating hormone, or FSH, to the ovaries and testes, where it helps ovarian follicles mature or supports sperm production. These examples show why naming a gland alone is not enough: a useful explanation connects a hormone to what it does.

2 ANSWER WITH EVIDENCE

Use the passage

1. Trace how TSH from the anterior pituitary affects energy use. How is PTH from the parathyroid glands different?

2. How do insulin and glucagon from the pancreas have different effects on blood glucose?

3. Compare the adrenal medulla's response to a sudden threat with the adrenal cortex's response to longer-lasting stress. Name each hormone and its effect.

4. How does FSH from the anterior pituitary work with the ovaries or testes? Name one hormone released by the gonad you chose and explain one of its functions.

3 YOUR TURN

Your own words

After an afternoon outdoors with little water, you enter a dark room to sleep. In four sentences, explain how the hypothalamus, posterior pituitary, and pineal gland use two named hormones to help with water balance and sleep timing.

Messages in Motion

PART 1 · READ AND MARK

Underline each named gland, circle its hormone or hormones, and connect each circled hormone to the words that tell what it does. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Trace how TSH from the anterior pituitary affects energy use. How is PTH from the parathyroid glands different?	**TSH prompts the thyroid to release thyroid hormones, which raise the rate at which many cells use energy. PTH raises blood calcium levels.**
2	How do insulin and glucagon from the pancreas have different effects on blood glucose?	**Insulin helps cells take up glucose and the liver store it as glycogen. Glucagon tells the liver to release stored glucose when blood glucose falls.**
3	Compare the adrenal medulla's response to a sudden threat with the adrenal cortex's response to longer-lasting stress. Name each hormone and its effect.	**The adrenal medulla releases epinephrine, which speeds the heartbeat and prepares the body for quick action. The adrenal cortex releases cortisol, which helps maintain blood glucose and supports the stress response.**
4	How does FSH from the anterior pituitary work with the ovaries or testes? Name one hormone released by the gonad you chose and explain one of its functions.	**FSH helps ovarian follicles mature; the ovaries release estrogen, which helps regulate the menstrual cycle. Alternatively, FSH supports sperm production; the testes release testosterone, which also supports sperm production.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

After I lose water outside, my hypothalamus makes ADH. My posterior pituitary releases ADH, which tells my kidneys to conserve water. Later, darkness leads my pineal gland to release melatonin. Melatonin signals nighttime and helps set my sleep timing.

Accept answers that accurately connect each hormone to its gland and function. For the open task, distinguish where ADH is made from where it is released.