Signals and Systems

Trace how structures and hormones work together in reproduction

HAP.12 "Use models to compare and contrast the internal and external structures of the female and male reproductive systems and their production of gametes. a. Construct an explanation of how the endocrine system influences the growth..."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline each organ that makes gametes and the gametes it makes, circle one external structure in each system, and number the stages of the brain-to-gonad hormone pathway in order.

Two Routes, Shared Signals

1. Imagine tracing two routes on a body model, starting where gametes are made. In the male system, testes sit in the external scrotum, where they produce sperm continuously after puberty. Sperm mature in the epididymis, travel through the internal vas deferens, and leave through the urethra in the penis. In the female system, ovaries lie inside the pelvis and usually release one egg during each menstrual cycle. The egg enters a fallopian tube and may reach the uterus, which can support a developing embryo. The external vulva surrounds the openings of the vagina and urethra.

2. Neither set of gonads works alone. At puberty, the hypothalamus in the brain increases its pulses of gonadotropin-releasing hormone (GnRH) to the pituitary gland. In both systems, the pituitary releases follicle-stimulating hormone (FSH) and luteinizing hormone (LH). In testes, FSH supports sperm production, while LH stimulates testosterone release. Testosterone helps develop reproductive organs and traits such as a deeper voice. In ovaries, FSH supports follicle growth and estrogen production. A surge of LH triggers ovulation, and the ovary then makes progesterone. Estrogen and progesterone help build and maintain the uterine lining. Hormones also signal back to the brain, adjusting further release.

3. Now consider a combination birth control pill containing estrogen and progestin, a hormone that acts like progesterone. When taken as directed, these hormones provide feedback to the hypothalamus and pituitary, lowering FSH and preventing the LH surge that normally triggers ovulation. Without that surge, an ovary usually does not release an egg. Progestin also thickens cervical mucus, making it harder for sperm to enter the uterus. This method acts mainly on the female system, not by stopping sperm production in testes. It does not protect against sexually transmitted infections, so pregnancy prevention and infection prevention are different questions.

2 ANSWER WITH EVIDENCE

Use the passage

1. Compare the locations of the organs that make sperm and eggs. Where does each gamete go next?

2. Trace a path for sperm and a path for an egg from their source toward an organ farther along the route. How do the paths differ?

3. How do FSH and LH affect the testes differently from the ovaries?

4. Explain two ways a combination birth control pill reduces the chance of pregnancy, using the hormone pathway and reproductive structures in your answer.

3 YOUR TURN

Your own words

A classmate claims, "A combination birth control pill prevents pregnancy by stopping sperm production in testes." In five sentences, correct the claim using an external and an internal structure from each system, the brain-to-gonad hormone pathway, and two actions of the pill.

Signals and Systems

PART 1 · READ AND MARK

Underline each organ that makes gametes and the gametes it makes, circle one external structure in each system, and number the stages of the brain-to-gonad hormone pathway in order. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Compare the locations of the organs that make sperm and eggs. Where does each gamete go next?	**Testes in the external scrotum make sperm, which next mature in the epididymis. Ovaries inside the pelvis release eggs into fallopian tubes.**
2	Trace a path for sperm and a path for an egg from their source toward an organ farther along the route. How do the paths differ?	**Sperm move from the testes through the epididymis and vas deferens toward the urethra. An egg moves from an ovary through a fallopian tube toward the uterus.**
3	How do FSH and LH affect the testes differently from the ovaries?	**In testes, FSH supports sperm production and LH stimulates testosterone release. In ovaries, FSH supports follicle growth and estrogen production, while an LH surge triggers ovulation.**
4	Explain two ways a combination birth control pill reduces the chance of pregnancy, using the hormone pathway and reproductive structures in your answer.	**Hormonal feedback to the hypothalamus and pituitary prevents the LH surge, so an ovary usually does not release an egg. Progestin thickens cervical mucus, making it harder for sperm to enter the uterus.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

The external scrotum holds the testes, where sperm are made, and the internal vas deferens carries sperm farther along their route. The external vulva surrounds the vaginal opening, while internal ovaries release eggs into fallopian tubes. In both systems, the hypothalamus signals the pituitary, which releases FSH and LH to regulate the gonads. A combination pill provides hormonal feedback that prevents the LH surge and usually prevents ovulation. It also thickens cervical mucus, rather than stopping sperm production in testes.

Accept equivalent descriptions of the hormone pathway and structures. The response should distinguish preventing ovulation and thickening cervical mucus from stopping sperm production.