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CHAPTER 23

THE ENDOCRINE SYSTEM AND REPRODUCTION

SECTION 23-1 The Endocrine System (pages 724–728)

This section explains how the endocrine system works to control activities in the body.

▶ The Role of the Endocrine System (page 724)

1. What does the endocrine system control? The endocrine system controls many of the body's daily activities as well as long-term changes such as development.

2. The endocrine system is made up of glands, organs that produce chemicals.

3. Is the following sentence true or false? Endocrine glands release their chemical products through delivery tubes. false

▶ Hormones (pages 725–726)

4. The chemical product of an endocrine gland is a(n) hormone, or chemical messenger.

5. How do hormones affect the body? Hormones turn on, turn off, speed up, or slow down the activities of different organs and tissues.

6. Circle the letter of each sentence that is true about hormones.

   a. Hormones can regulate only the tissues and organs near the glands that produce them.

   (b.) Nerve impulses from the brain can cause the release of hormones.

   (c.) Hormones cause a slower, but longer-lasting response.

   d. Any hormone can affect any organ in the body.

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CHAPTER 23, The Endocrine System and Reproduction *(continued)*

7. A hormone interacts only with certain target cells, cells that recognize the hormone's chemical structure.

Match the endocrine gland with the function of the hormone it produces. See *Exploring the Endocrine System* on pages 726–727.

Glands	Functions of the Hormones
d 8. thyroid glands	a. Control the changes that take place in the body of a teenage boy
b 9. adrenal glands	b. Trigger the body to respond to emergencies
e 10. ovaries	c. Helps the immune system fight infection
a 11. testes	d. Control the release of energy from food molecules during respiration
c 12. thymus	e. Control the changes in a teenage girl's body

▶ The Hypothalamus (page 726)

13. Circle the letter of each sentence that is true about the hypothalamus.
   a. The hypothalamus links the nervous system and the excretory system.
   b. The hypothalamus is located on the kidneys.
   (c) The hypothalamus sends nerve messages and produces hormones.
   (d) The hypothalamus plays a major role in maintaining homeostasis.

▶ The Pituitary Gland (page 727)

14. What is the pituitary gland? It is a small endocrine gland that communicates with the hypothalamus to control many body activities.

15. Is the following sentence true or false? The pituitary gland releases hormones in response to nerve impulses or hormone signals from the hypothalamus. true

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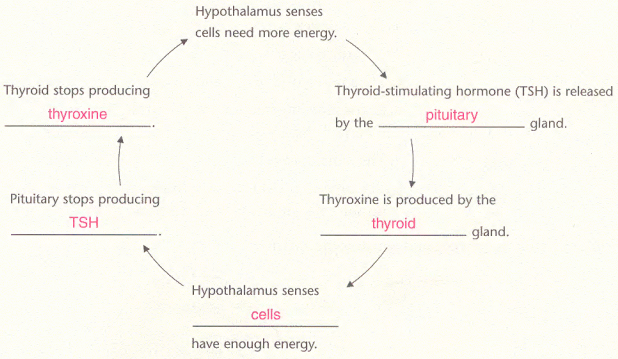
▶ Negative Feedback (page 728)

16. How does negative feedback work to control the amount of a hormone in the blood? When the amount of a particular hormone in the blood reaches a certain level, the endocrine system sends signals that stop the release of that hormone.

17. Complete the cycle diagram to show how thyroxine, a hormone produced by the thyroid gland, is regulated by negative feedback.



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Reading Skill Practice

Knowing the meanings of the key terms in a section will help you to better understand what you are reading. Make a list of key terms in this section. Write the meanings of these terms using your own words. In this way, the key terms become a natural part of your vocabulary. Do your work on a separate sheet of paper.

Definitions for the six key terms should be written in the students' own words, but be based on the information on pages 724–728.

SECTION 23–2

The Male and Female Reproductive Systems

(pages 729–734)

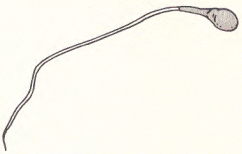
This section describes the structures and functions of the organs in the male and female reproductive systems. It also explains the events in the menstrual cycle.

▶ Sex Cells (pages 729–730)

Match each key term with its definition.

Terms	Definitions
e 1. egg	a. The male sex cell
a 2. sperm	b. A fertilized egg
c 3. fertilization	c. The joining of a sperm and an egg
f 4. reproduction	d. Carries the information that controls inherited characteristics
b 5. zygote	e. The female sex cell
d 6. chromosome	f. The process by which living things produce new individuals of the same type

7. Identify which is the egg and which is the sperm.



a. sperm

b. egg

8. Is the following sentence true or false? A sex cell has the same number of chromosomes as a body cell. false

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▶ The Male Reproductive System (pages 730–731)

9. What is the male reproductive system specialized to produce?

a. sperm b. the hormone testosterone

10. Circle the letter of the organs in the male where sperm are produced.

a. testosterone (b.) testes c. scrotum d. penis

11. What does testosterone control? Testosterone controls the development of physical characteristics in men.

12. The testes are located in an external pouch of skin called the scrotum.

13. Is the following sentence true or false? Sperm can develop normally only in slightly cooler temperatures than normal body temperature.

true

14. What does semen provide to sperm?

a. An environment in which sperm can swim

b. Nutrients that give moving sperm a source of energy

15. Semen leaves the body through an organ called the penis.

▶ The Female Reproductive System (pages 732–733)

16. What is the role of the female reproductive system? The female reproductive system produces eggs, and if an egg is fertilized, nourishes a developing baby until birth.

17. What do ovaries produce?

a. egg cells

b. hormones such as estrogen

18. What does estrogen control? Estrogen triggers the development of some adult female characteristics and helps egg cells develop.

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19. Complete the flowchart to show the path of an egg cell.

Path of an Egg

Ovary produces an egg cell.

↓

The egg cell moves through the oviduct where it can be fertilized.

↓

The egg enters the uterus where it stays to develop if it's fertilized.

↓

An unfertilized egg begins to break down and enters the muscular passageway leading to the outside of the body called the vagina, or birth canal.

▶ The Menstrual Cycle (pages 733–734)

20. Circle the letter of how often an egg is released from the ovaries.
    a. daily **b.** weekly **c.** monthly **d.** yearly

21. The monthly cycle of changes that occurs in the female reproductive system is called the menstrual cycle.

22. What occurs during the menstrual cycle? An egg develops in an ovary, and the uterus prepares for the arrival of a fertilized egg.

23. The menstrual cycle prepares the body for pregnancy, the condition that begins after fertilization has taken place.

24. Circle the letter of each sentence that is true about menstruation.
    a. Menstruation lasts about 28 days.
    b. Hormones of the endocrine system control the menstrual cycle.
    c. All girls begin menstruation at the same age.
    d. Women stop releasing eggs from their ovaries at about the age of 50.

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SECTION 23-3

Pregnancy, Birth, and Childhood

(pages 735–741)

This section explains how babies develop before birth, what happens during birth, and what happens as babies develop into children.

▶ Introduction (page 735)

1. After fertilization, the zygote develops first into an embryo and then into a(n) fetus.

▶ The Zygote (page 735)

2. Is the following sentence true or false? The zygote begins to divide to make two, and then four cells before it enters the uterus.

true

3. The growing mass of cells forms a hollow ball and attaches to the lining of the uterus, at which time the developing human is called a(n) embryo.

▶ The Development of the Embryo (pages 736–737)

4. The membrane that surrounds the embryo and develops into a fluid-filled sac is called the amniotic sac.

5. What is the placenta? The placenta is a membrane that becomes the link between the developing embryo and the mother.

6. What is the function of the umbilical cord? The umbilical cord contains blood vessels that link the embryo to the mother, but the two circulatory systems remain separated by a thin barrier.

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7. Is the following sentence true or false? Substances, such as chemicals from tobacco smoke and alcohol, can pass from the mother to the embryo. true

▶ The Development of the Fetus (page 737)

8. Complete the table to show the development of the fetus.

The Development of the Fetus	
Time in Development	**What Is Happening**
Nine weeks	Embryo is called a fetus; internal organs have developed; has dark eye patches, fingers, and toes.
From fourth to sixth month	Tissues develop into more recognizable shapes; bones are distinct; heartbeat can be heard; fetus begins to kick.
Final three months	Brain surface develops grooves and ridges; lungs develop; eyelids can open and eyelashes and eyebrows grow.

▶ Birth (pages 738–739)

9. List the three stages of the birth of a baby.

a. labor b. delivery c. afterbirth

10. Circle the letter of each sentence that is true about birth.

(a) Strong muscular contractions, called labor, enlarge the cervix so that the baby fits through it.

b. During delivery, the baby is pushed feet first out of the uterus, through the vagina, and out of the mother's body.

(c) After delivery, the umbilical cord is clamped and cut.

d. After labor, contractions push out the placenta and other membranes into the vagina.

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11. How does the baby's body adjust to the stress of the birth process?

The baby's endocrine system releases adrenaline, which increases the baby's heart rate. The baby cries or coughs to clear its lungs and fill them with air.

▶ Multiple Births (page 739)

Match the type of twins with its characteristics. Each type of twins may be used more than once.

Characteristics	Types of Twins
a 12. Develop from a single fertilized egg	a. identical twins
b 13. Develop when two eggs are released from the ovary and fertilized by two different sperm	b. fraternal twins
b 14. Are no more alike than any brothers or sisters	
a 15. Have identical inherited traits and are the same sex	

16. Is the following sentence true or false? Triplets and other multiple births can occur only when three or more eggs are produced and fertilized by different sperm. false

▶ Infancy (page 740)

17. Is the following sentence true or false? As a baby grows, its head grows more slowly, and its body, legs, and arms grow quickly to catch up.

true

18. Circle the letter of the physical skill that babies develop first.

a. crawl b. grasp objects c. walk d. hold up their heads

19. Is the following sentence true or false? Babies can communicate only by crying. false

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▶ Childhood (page 741)

20. Circle the letter of each sentence that is true about childhood.

a. Childhood begins at about the age of 13 years.

(b.) Children become taller and heavier and become more coordinated.

c. As they develop, children become less curious.

(d.) Children learn to think about and care for others as they grow.

SECTION 23-4 Adolescence–A Time of Change (pages 742–747)

This section describes what adolescence and puberty are. It also explains what changes occur during adolescence.

▶ Introduction (pages 742–743)

1. What is adolescence? Adolescence is the stage of development when children become adults physically and mentally.

▶ Physical Changes (pages 743–744)

2. The physical changes that occur during adolescence are controlled by hormones produced by the endocrine system.

3. What is puberty? Puberty is the period of sexual development in which the body becomes able to reproduce.

4. Circle the letter of each physical change of puberty that occurs in girls.

a. voice deepens
(b.) ovulation starts
(c.) body odor increases
(d.) hips widen

5. Circle the letter of each physical change of puberty that occurs in boys.

a. hips widen
(b.) sperm are produced
(c.) hair grows on face
(d.) body odor increases

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6. Is the following sentence true or false? All adolescents grow and develop at the same rate. false

▶ Mental and Social Changes (pages 745–746)

7. Circle the letter of each sentence that is true about changes in the way teenagers feel.
   a. Teenagers cannot think beyond what's happening at the moment.
   b. Teenagers can think about the consequences of their actions.
   c. During adolescence, individuals begin to question things they once accepted as children.
   d. Teens usually don't wonder what they will do with their lives.

8. How do adolescents change socially? Teens become more independent and spend more time with friends. Teens become more interested in the opposite sex. Teens may be influenced by peer pressure.

▶ Life as an Adult (pages 746–747)

9. Is the following sentence true or false? Adulthood definitely begins at the age of 18 years. false

10. Circle the letter of the age when the process of aging begins.
    a. 20 years b. 30 years c. 40 years d. 50 years

11. What changes occur to the body during aging? The skin becomes wrinkled, eyes lose ability to focus on close objects, the hair loses its coloring, and muscle strength decreases.

12. Is the following sentence true or false? The effects of aging can be slowed if people follow sensible diets and exercise regularly. true

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WordWise

Use the clues to identify the words for the puzzle. Write the words on the lines. Then find the words hidden in the puzzle and circle them. Words are across or up-and-down.

Clues	Key Terms
The chemical product of an endocrine gland	hormone
The stage of development in which the developing human attaches to the lining of the uterus	embryo
The stage of development from the ninth week of development until birth	fetus
The period of sexual development in which the body becomes able to reproduce	puberty
A fertilized egg	zygote
The mixture of sperm cells and fluids	semen
The female organ that produces egg cells and hormones like estrogen	ovary
The hormone in females that triggers the development of some adult female characteristics	estrogen

p	g	e	s	t	r	o	g	e	n	m	z
u	o	t	s	e	m	e	n	p	j	l	y
b	v	h	d	e	u	a	i	s	z	y	g
e	a	f	e	t	u	s	p	h	u	d	o
r	r	i	o	e	m	b	r	y	o	l	t
t	y	n	b	r	e	h	d	k	o	p	e
y	c	p	h	o	r	m	o	n	e	w	t

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