Ways to Care for the Endocrine System

The **endocrine system** is the body system made up of glands that produce hormones. A **hormone** is a chemical messenger that regulates body activities. Endocrine glands control many of the changes in the body. Each gland produces a different hormone. Each hormone has a different function.

Take care of your endocrine system:

1. Have regular medical checkups.
2. Ask your parents or guardian and physician questions about your growth.

Activity

Body System Bee

Life Skill I will keep my body systems healthy.

Materials: None

Directions: Play Body System Bee to review your knowledge about body systems.

1. **All students will stand by their desks.** Your teacher will call on a student and give that student a vocabulary word from the lesson.
2. **The student will give the definition, the body system to which it belongs, and one way to take care of the body system.** The student will remain standing if the answer is correct. The student will sit down if the answer is incorrect.
3. **Your teacher will continue to call on students until one student remains standing.**

Unit 3 Lesson 12

You Can Recognize Ways You Are Changing

Vocabulary

adolescence
pituitary gland
growth hormone
growth spurt
gonads
puberty
secondary sex characteristics
menstrual cycle
menstrual period
mood swings
unique
chromosome
gene
dominant gene
recessive gene

Life Skills

- **I will recognize habits that protect female reproductive health.**
- **I will recognize habits that protect male reproductive health.**

Adolescence is the period between childhood and adulthood. A person between childhood and adulthood is called an adolescent. Adolescents change in many ways during this period.

The Lesson Objectives

- Describe how your body changes during adolescence.
- Discuss how your feelings change during adolescence.
- Explain why you are unique.

How Your Body Changes

The **pituitary gland** is a gland that secretes hormones that control other glands. It is a small pea-sized gland at the base of the brain. It is the body's master gland and produces growth hormone.

Growth hormone is a hormone that makes the body grow. The production of growth hormone increases in adolescence. This causes a growth spurt. A **growth spurt** is a period of rapid growth. Your growth spurt will be unique to you. The amount of growth hormone produced affects how much and how fast you will grow. It might seem like you are outgrowing your clothes and shoes overnight! Or it might seem like all of your classmates are growing faster than you.

The pituitary gland makes hormones that affect the gonads. The **gonads** are reproductive glands. **Puberty** (PYOO·ber·tee) is the period in which gonads first begin to make hormones. These hormones cause secondary sex characteristics to develop. **Secondary sex characteristics** are changes that make an adolescent's body adultlike.

The physical changes during puberty enable the male and female to produce offspring. But adolescents are not ready for the responsibilities that accompany parenthood. You learned reasons in Lesson 9.

Body Changes in Males

Puberty usually begins between 12 and 15 years of age in males. The testes make a hormone called testosterone. Testosterone produces secondary sex characteristics. Males can grow from 4 to 12 inches during their growth spurt. They might grow as much as 7 inches in six to twelve months. Hair grows in the pubic area, under the arms, and on the face and chest. A deeper voice tone develops. Growth in males is accompanied by changes in the reproductive organs. A male begins to produce sperm cells.

Body Changes in Females

Puberty occurs in females between the ages of 8 and 15. The ovaries make a hormone called estrogen. Estrogen produces the secondary sex characteristics. A female will grow two to eight inches during puberty. She will grow pubic hair and underarm hair. Her body will take more of a female shape. Fat will deposit in her breasts and her hips will widen.

Normal growth in a female is accompanied by development of the reproductive organs. The changes in these organs are a sign that a female is approaching adulthood. One signal is the start of the menstrual cycle. The **menstrual** (MEN·struhl) **cycle** is a monthly series of changes that occur in a female's body. An ovary releases an egg cell each month.

The uterus is the female organ in which a fertilized egg can grow. A thick lining of blood develops inside the uterus. The lining of the uterus breaks down if the egg cell is not fertilized by a sperm cell from the male. The **menstrual period** is the shedding of the lining of the uterus. The menstrual period normally occurs about every 28 days. The number of days between menstrual periods might vary.

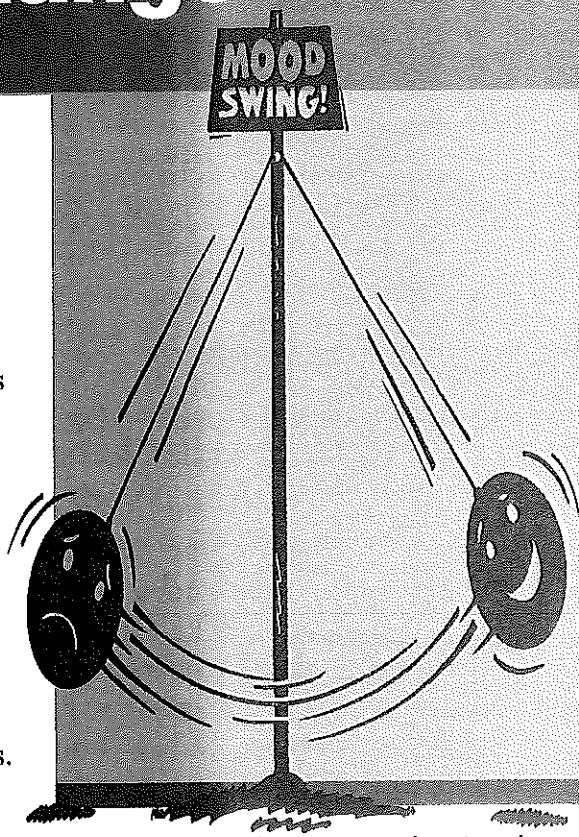
Habits That Protect Reproductive Health

- **Have regular medical checkups.** A physician can examine you and answer any questions you have.
- **Practice abstinence from sex.** Practicing abstinence prevents pregnancy outside of marriage. Practicing abstinence prevents infection with HIV and other STDs.
- (Females Only) **Practice habits to reduce the chance of menstrual cramps.** Limit the amount of caffeine and sodium in your diet. Exercise regularly.
- (Males Only) **Wear protective clothing for sports.** A protective cup prevents injuries to the penis and testes.

How Your Feelings Change

Feelings are emotions, such as excitement, sadness, happiness, and anger. The strength of your feelings is influenced by hormones. During puberty, the endocrine glands secrete hormones at an uneven rate. **Mood swings** are changes in feelings caused by hormone levels. You might feel like jumping for joy one moment. The next moment you might feel down in the dumps. Mood swings can be confusing. Remember, other adolescents have them, too.

Part of becoming more adultlike is learning to express feelings in healthful ways. To do this, you must recognize your feelings. You must understand why you feel the way you do. Then you must choose appropriate ways to express feelings. Remember, you are accountable for the way you express feelings. Follow the suggestions in How to Recognize and Express Feelings in Healthful Ways.



How to Recognize and Express Feelings in Healthful Ways

Directions: Ask the following questions to understand what you are feeling and to learn how to express feelings in healthful ways.

1. **What am I feeling?**
2. **Why do I feel the way I do?**
3. **How might I express what I am feeling in a healthful way?**
   - Do I need to talk to my parent, guardian, or other caring adult?
   - Would writing in a journal be helpful?
   - Would it be helpful to spend time alone and sort out my feelings?
   - Could I express my feelings in a creative way, such as by writing a poem or by drawing?
   - Would it be healthful to work off my feelings with exercise?
   - What I-message might I use to express my feelings during conversation?

Why You Are Unique

To be **unique** is to be one of a kind. You are one of a kind. No one is exactly like you. Your heredity helps you be unique. Heredity is the sum of traits that have been transmitted from a person's biological parents.

How You Inherit Traits

The nucleus of each cell in your body contains chromosomes. A **chromosome** (KROH·muh·sohm) is a strand of matter found in the nucleus of a cell. Most cells contain 46 chromosomes. The exception is the reproductive cells. An egg cell has 22 chromosomes plus an X chromosome. A sperm cell has 22 chromosomes plus an X or a Y chromosome. A baby is male if the egg cell is fertilized by a sperm cell that has a Y chromosome. A baby is female if the sperm cell has an X chromosome. The fertilized egg has 23 pairs or a total of 46 chromosomes. As the fertilized egg cell divides, each new cell contains an exact copy of the 23 pairs of chromosomes.

Chromosomes contain pairs of genes. A **gene** (JEEN) is a tiny piece of information that influences heredity. Each pair of genes contains information from your mother and from your father. The information might be the same or different. A **dominant gene** is a gene that produces an observable trait. A **recessive gene** is a gene that produces an observable trait only if the other gene in the pair is the same.

Let's use the example of eye color. Eye color is produced by a pair of genes. A gene for brown eye color is dominant, while a gene for blue eye color is recessive. A person will have brown eyes if both genes in the pair are brown. A person will have brown eyes if one gene in the pair is brown and the other is blue. The only way to have blue eyes is if both genes in the pair are for blue eye color.

Heredity is the beginning of maleness or femaleness. But there is more to being male or female than having a male or female body. Your father, mother, and other important adults teach you about being male or female. You observe their behavior and attitudes. You develop expectations for yourself and others. Do you feel good about being male or female? Do you respect people of the opposite sex?

How Y and X Determine Sex

Activity

Life Skills

I will recognize habits that protect female reproductive health.

I will recognize habits that protect male reproductive health.

Materials: Tennis balls cut in half, paper and pencil

Directions: Complete this activity to demonstrate how sex is determined.

1. **Tear off three slips of paper, about 1 inch by 2 inches.** Write "Egg—X" on one slip; "Sperm—X" on another slip; and "Sperm—Y" on the third slip.
2. **Place the slip labeled "Egg—X" in one half of the ball and place one of the slips labeled "Sperm" in the other half.** Put the two halves together. This is the single cell formed when an egg and a sperm join.
3. **Draw a large circle on a separate sheet of paper.** In the center of the circle, copy the labels from the slips inside the ball. Write the sex of the baby under the circle.
4. **Put the two halves together again, using the other slip of paper labeled "Sperm."** Complete and label another circle.

Lesson 12 Review

Vocabulary

Write a separate sentence using each of the vocabulary words listed on page 92.

Health Content

Write responses to the following:

1. Why do you have a growth spurt during adolescence? **page 93**
2. What are the male secondary sex characteristics? **page 93** The female secondary sex characteristics? **page 94**
3. Why do mood swings occur in puberty? **page 95**
4. What are three questions to ask yourself to recognize and express your feelings in healthful ways? **page 95**
5. Why is each person unique? **page 96**