

25-1 Human Reproduction Systems

Key Points

- The testes and the ovaries produce sex cells and secrete hormones.
- Estrogen is a hormone that helps stimulate the onset of puberty, and affects the uterus and pituitary.

Study Hint

As you read Section 25-1, list in order the structures through which sperm and egg cells pass.

Figure 25-1 In males, the urethra is part of both the urinary system and the reproductive system.

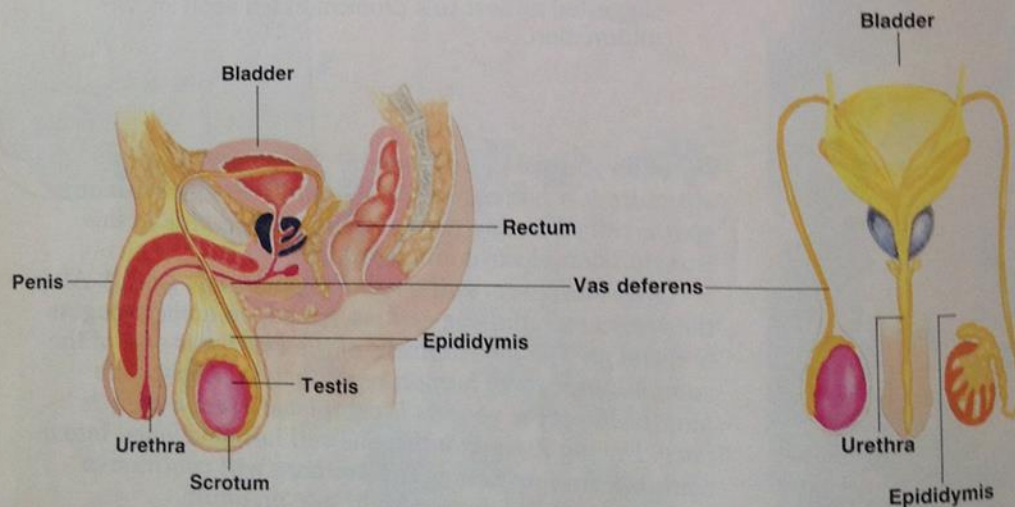
The function of the reproductive system is to produce offspring. Unlike most organ systems, the reproductive system differs in men and women. These differences become noticeable as early as six weeks after a baby begins to develop.

The Male Reproductive System

The male reproductive system includes sex organs called the **testes**. (TES-teez). These two egg-shaped structures are located outside the body cavity. The testes are suspended within a pocket of skin called the **scrotum** (SKROH-tum).

Two kinds of cells are found within the testes. One kind of cell produces testosterone (tes-TAWS-tuhr-ohn). Testosterone is a hormone responsible for the onset of **puberty** (PYU-bur-tee). Puberty is the time at which a person develops secondary sex characteristics and becomes sexually mature. In the male, these characteristics include a deeper voice and the growth of body hair. Testosterone also causes a second kind of cell to develop inside the testes. These cells are called **sperm**, or male sex cells.

Sperm are stored in a coiled tube called the **epididymis** (ep-uh-DID-i-mis). Find the epididymis in Figure 25-1.



One end of the epididymis connects to the testes. The other end connects to a longer tube called the **vas deferens** (vas DEF-uh-renz). The vas deferens extends upward into the body cavity from the testes.

▲ Inside the body cavity, the vas deferens empties into the urethra. The urethra is surrounded and protected by the **penis**. The penis is the male reproductive organ that deposits sperm in the female. Look at Figure 25-1 again. Notice that the epididymis, the vas deferens, and the urethra form a continuous passageway. Sperm enter this passageway from the testes and exit through the penis.

Several glands secrete a special fluid into the passageway. This fluid lubricates the passageway and helps carry the sperm. This combination of fluid and sperm is called semen. Semen is released from the body during the ejaculation (i-jak-yuh-LAY-shuhn), or ejection, process.

The Female Reproductive System

The main sex organs of the female are called the **ovaries** (OH-vuhr-eez). Look closely at Figure 25-3. Compare the shape and location of the female sex organs with the male sex organs in Figure 25-1. Notice that the ovaries are egg-shaped structures much like the testes. The major difference between the ovaries and testes is that the ovaries are located inside the body cavity.

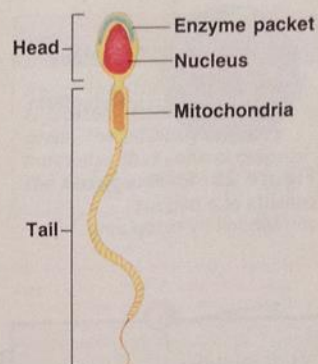
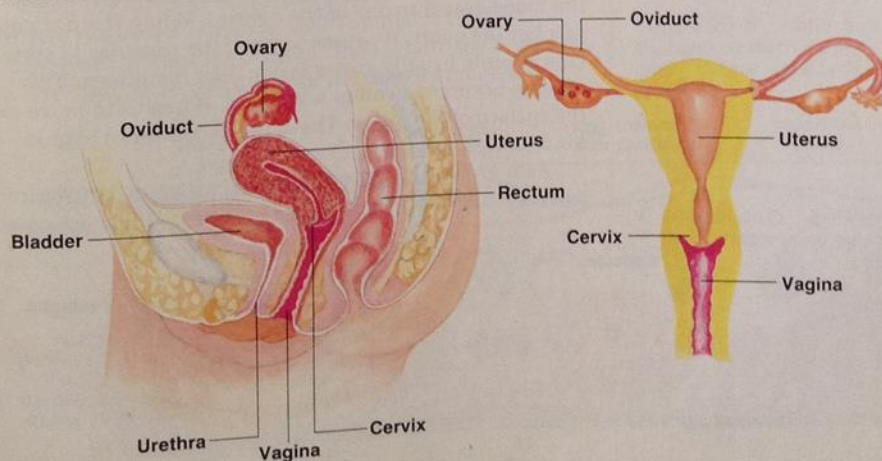


Figure 25-2 A human sperm cell is divided into a head and a tail.

Remind students that both urine and sperm exit the body through the urethra in men. In women, the urinary and reproductive passageways are separate.

Figure 25-3 All parts of the female reproductive system are inside the body cavity.

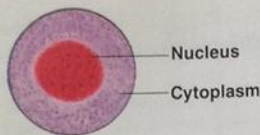


Figure 25-4 An egg cell consists of a nucleus surrounded by cytoplasm.

Skill Builder

Organizing Information
Sperm and egg cells are very different. A sperm cell has a small head containing the nucleus. Behind the head is a long tail. An egg cell is larger than a sperm cell. The egg is round and does not have a tail. A small nucleus is found in the center of the cell. In a chart, list each of the structures of the sperm and egg cell. Explain the relationship between each structure and its function.

Like the testes, the ovaries contain two kinds of cells. One kind of cell produces hormones. Two hormones produced by the ovaries are estrogen (ES-truh-juhn) and progesterone (proh-JES-tuhr-ohn). These hormones mainly are responsible for the secondary sex characteristics and the onset of puberty. The other kind of cell in the ovaries produce **eggs**. Eggs are female sex cells.

A long tube called the **oviduct** (OH-vuh-dukt) is located near the ovary. At the end of the oviduct closest to the ovary are fingerlike projections. The opposite end of the oviduct leads into the **uterus** (YU-tur-us), or womb. The uterus is a hollow organ with thick, muscular walls. Look at the diagram of the uterus in Figure 25-3 on page 439. Notice that the lower end of the uterus is narrower than the upper end. The narrow end of the uterus is called the **cervix** (SUR-viks). The cervix extends downward into the **vagina** (vuh-JY-nuh), or birth canal.

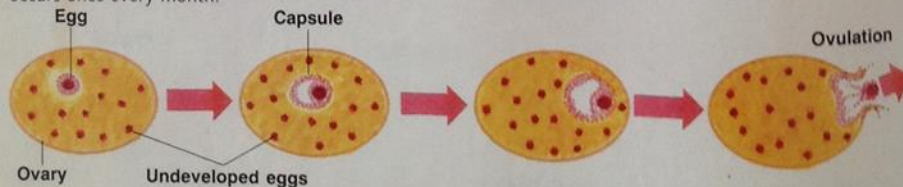
Ovulation

The production of egg cells begins before a girl is born. A baby girl is born with all the egg cells she will have in her lifetime. However, these eggs are not mature cells. Egg cells begin to mature, one by one, at the onset of puberty.

Girls usually reach puberty between the ages of 10 and 14. At this time, egg development begins. The eggs in each ovary are enclosed within a tiny capsule. Once a month, a hormone released by the pituitary gland travels through the bloodstream to one of the ovaries. When the hormone reaches the ovary, it causes some of the capsules to grow. One capsule usually grows faster than the others. This capsule becomes swollen with fluid. It begins to move to the surface of the ovary. The capsule continues to grow for 9 to 10 days.

As it grows, the capsule releases estrogen. Estrogen travels to the uterus and to the pituitary. When estrogen

Figure 25-5 Ovulation occurs once every month.



reaches the uterus, the blood supply reaches the pituitary hormone. This egg inside the oviduct. The capsule begins to break down.

After ovulation, the capsule becomes the corpus luteum. The hormone called progesterone is released from the corpus luteum into the uterine wall.

Menstruation

Once the egg is released from the ovary, it moves through the oviduct. If the egg is not fertilized, it begins to break down.

As the capsule breaks down, progesterone and estrogen are released. The tissue lining the uterus begins to shed. This process is called **menstruation**. Menstruation usually lasts 3 to 5 days.

When the egg is fertilized, the pituitary releases more estrogen. The development of the fetus begins.

Hormones
Ovary
Uterine lining

reaches the uterus, the walls of the uterus thicken and the blood supply to the uterus increases. When estrogen reaches the pituitary, the pituitary releases another hormone. This hormone causes the capsule to burst. The egg inside the capsule is then released and moves into the oviduct. The release of the egg occurs about 14 days after the capsule begins to grow. The release of the egg from its capsule is called **ovulation** (oh-vyuh-LAY-shun).

After ovulation, the capsule releases another hormone called progesterone. The progesterone travels to the uterus. Here it stimulates the continued buildup of the uterine wall.

Menstruation

Once the egg is released from the ovary, wavelike motions of the oviduct "fingers" pull the egg inward. The egg is moved through the oviduct by many hairs lining the oviduct. If the egg is not fertilized by a sperm cell, it begins to break down. The capsule also breaks down.

As the capsule breaks down, the amount of progesterone decreases. Without progesterone, the thick tissue lining the uterine wall also breaks down. About 14 days after ovulation, the tissue lining and excess blood leave the uterus through the vagina. This process is called **menstruation** (men-stroo-WAY-shun). Menstruation usually lasts 3 to 5 days.

When the amount of progesterone decreases, the pituitary releases a hormone that stimulates the development of another capsule. Soon a new egg begins to mature. The entire process from the development of a

Study Hint

Recall that the pituitary gland is located at the base of the brain. The pituitary releases hormones that control many of the body's activities.

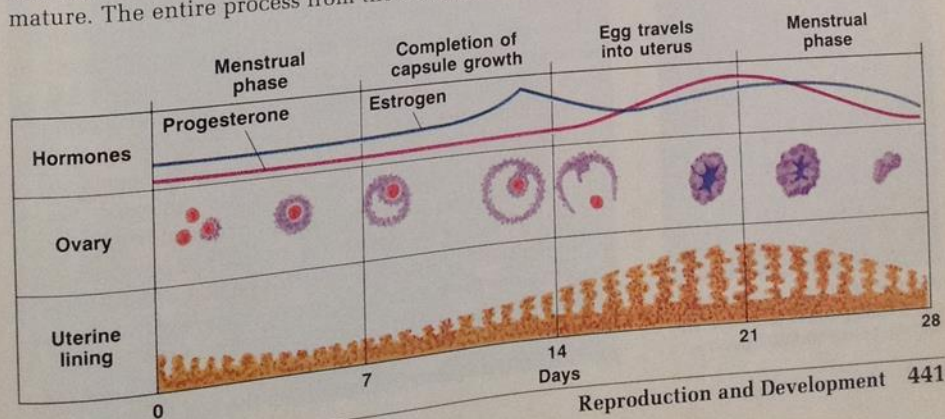
Tell students that each ovary releases an egg every other month. Ovulation occurs in the left ovary one month, in the right the next, and so on. This alternating pattern can affect the length of each cycle.

Most primates have a menstrual cycle. All other mammals have an estrous cycle.

Health and Safety Tip

The length of a woman's menstrual cycle can be affected by many outside factors. Illness, stress, weight loss, or weight gain can delay or even prevent menstruation.

Figure 25-6 Notice how the hormone levels change during the menstrual cycle.



1. the release of an egg from its capsule inside the ovary
2. to store sperm
3. Testes and ovaries produce sex cells and hormones.
4. Estrogen causes uterine walls to thicken; stimulates pituitary to release a hormone that causes the capsule to burst; stimulates the onset of puberty. Progesterone stimulates continued buildup of uterine wall; stimulates the onset of puberty.
5. The entire process is repeated every 28 to 32 days. (Relating concepts)

Key Points

- Food and oxygen diffuse across the uterine wall to the placenta and travel along the umbilical vein to the embryo.
- The skeleton of an embryo is made of cartilage, while that of a fetus is made mostly of bone.

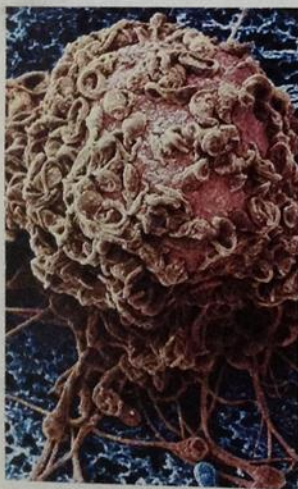


Figure 25-7 Many sperm cover an egg cell in this scanning electron micrograph.

capsule to menstruation is called the menstrual cycle. The menstrual cycle is repeated every 28 to 32 days.

Think & Discuss

1. What is ovulation?
2. What is the function of the epididymis?
3. Describe the functions of the testes and ovaries.
4. Explain the roles of estrogen and progesterone.
5. Why are the regular changes in the female reproductive system called a cycle?

25-2 Human Reproduction

The process of human reproduction begins when a sperm cell and an egg cell unite inside the oviduct of a woman. Once this union occurs, the egg passes through several stages of growth and development. Many changes also take place inside the woman's body during this period. Her menstrual cycle has stopped. The major job of her body at this point is to maintain the new life she is carrying. Human reproduction is complete when a new human being is born.

Tell students that it is critical for normal development that only one sperm fertilize the egg. If many sperm were to enter the egg nucleus, polyploidy would result. This would kill the egg cell.

Fertilization

After an egg leaves its capsule and enters the oviduct, **fertilization** (fur-tul-i-ZAY-shun) can occur. Fertilization is the union of one sperm and one egg cell. Millions of sperm enter the uterus after ejaculation, but only a few reach the upper oviduct. Of those few, only one sperm is allowed to fertilize the egg.

Look at how many sperm are covering the egg in Figure 25-7. How does a sperm cell enter the egg? What prevents the rest of the sperm from entering?

At the head of each sperm is a packet of enzymes. When the sperm meets the egg, this packet breaks open. The enzymes dissolve a hole in the outer layer of the egg. This hole is big enough for just one sperm. As soon as one sperm has entered, the egg forms a membrane that prevents other sperm from entering the egg.

Development

After fertiliza- fertilized egg, uterus. While series of cell form two cell continues un- ball attaches

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The plac blood vessels vessels in the that line the v leave the emb placenta by d

From the vessels of the woman's body from the wom uterus to the carry these n

A thick, re (um-BIL-ih-ku



Development of the Embryo

After fertilization has occurred, the **zygote** (ZY-goht), or fertilized egg, travels down the oviduct and enters the uterus. While in the oviduct, the zygote undergoes a series of cell divisions. The single-celled zygote divides to form two cells, then four cells, and so on. Cell division continues until a hollow ball of cells forms. This hollow ball attaches to tissues that line the wall of the uterus.

When the mass is buried deep inside the wall of the uterus, some remarkable events begin to occur. The mass of cells now is called an **embryo** (EM-bree-oh). The tissue surrounding the embryo develops into a thick, flat structure called the **placenta** (pluh-SEN-tuh).

The placenta contains millions of blood vessels. The blood vessels carry blood from the embryo. The blood vessels in the placenta are very close to the blood vessels that line the wall of the uterus. Wastes and carbon dioxide leave the embryo and enter the blood vessels of the placenta by diffusion.

From the placenta, the wastes diffuse into the blood vessels of the uterus. These waste materials leave the woman's body with her own wastes. Food and oxygen from the woman diffuse across the blood vessels of the uterus to the placenta. The blood vessels in the placenta carry these nutrients to the developing embryo.

A thick, ropelike structure called the **umbilical** (um-BIL-ih-kul) **cord** connects the embryo to the placenta.



Health and Safety Tip

The placenta is not a barrier. Everything that enters a pregnant woman eventually will cross the placenta and reach the embryo. Drugs, alcohol, tobacco, and caffeine can cross the placenta and harm the developing embryo.

Study Hint

Review the process of diffusion in Chapter 4.

Figure 25-8 Find the umbilical cord in this photo of a ten-week-old fetus.

Remind students that blood from the pregnant woman never mixes with that of the embryo. Nutrients and wastes are exchanged by the process of diffusion.

The umbilical cord contains two large blood vessels. These vessels are the umbilical vein and the umbilical artery. The umbilical vein carries nutrient-rich blood from the placenta to the embryo. The umbilical artery carries wastes from the embryo to the placenta.

A clear, fluid-filled membrane called the **amnion** (AM-nee-on) surrounds the embryo. The amnion prevents the embryo from sticking to the uterine wall. The fluid inside the amnion is called the amniotic (am-nee-AH-tik) fluid. The amniotic fluid cushions and protects the embryo.

Pregnancy

The period of development of an organism inside its mother's body is called the gestation period, or **pregnancy** (PREG-nun-see). Gestation periods vary from one kind of organism to another. In humans, the gestation period is 38 weeks, or about nine months.

■ Pregnancy brings about many changes in a woman's body. One of the first signs of pregnancy is breast enlargement and periods of nausea. Weight gain usually begins once the placenta, umbilical cord, and amniotic fluid start to develop. Most women gain between 10 and 20 kg during their pregnancy. Some women develop back pain and swollen feet as a result of this extra weight. The most common problem associated with pregnancy is a

In the 1950s, a drug called diethylstilbestrol, or DES, was given to pregnant women to prevent miscarriages. Many of the daughters of these women now have reproductive problems such as sterility, miscarriages, and cancer of the reproductive organs.



Figure 25-9 This four-month-old fetus is in the second stage of development.

feeling of exhaustion to meet her own

During the first embryo develops begin to develop and leg buds with time, bone gradually embryo's skeletal the embryo is called

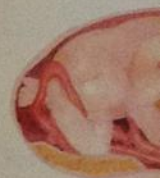
During the next size. Major body and grow. The ar

During the last gains a great deal fetus also develops pregnancy is nearly by turning itself head-down position

Birth

About nine months begin to occur in to tighten, or contract of the uterus are

Once labor begins the baby's head at 25-10. The cervix 10 centimeters. The baby's head to pass



feeling of exhaustion. A woman's body must work harder to meet her own needs as well as those of her baby.

During the first three months of pregnancy, the tiny embryo develops rapidly. The heart, brain, and nerve cord begin to develop. The eyes and ears begin to form. Arm and leg buds with fingers and toes also form. About this time, bone gradually begins to replace cartilage in the embryo's skeleton. After bone replacement is complete, the embryo is called a **fetus**.

During the next three months, the fetus increases in size. Major body systems and organs continue to develop and grow. The arms and legs get longer.

During the last three months of pregnancy, the fetus gains a great deal of weight. Its body grows longer. The fetus also develops a layer of protective fat. At this time, pregnancy is nearing an end. The fetus prepares for birth by turning itself upside down. The fetus remains in this head-down position until birth.

Birth

About nine months after fertilization, hormonal changes begin to occur in the mother. Hormones cause the uterus to tighten, or contract, and then relax. These contractions of the uterus are called labor.

Once labor begins, the force of the contractions pushes the baby's head against the cervix, as shown in Figure 25-10. The cervix stretches to provide an opening of about 10 centimeters. This opening is just big enough for the baby's head to pass through. Labor continues until the

In the 1940s and 1950s, pregnant women who suffered from insomnia were given the drug thalidomide. This drug caused gross deformities and malformations in newborns

Study Hint

Each three-month period of pregnancy is called a **trimester**.

Figure 25-10 During labor, the baby is pushed against the cervix (left) and out of the mother's body (right).



baby's body is pushed into the vagina and out of the mother's body. Further contractions push the placenta out of the mother's body.

When the baby leaves the birth canal, it is still connected to its mother by the umbilical cord. The cord first is tied to decrease blood loss and then cut. The small portion of the cord still attached to the baby will dry up and leave a scar. This scar is the navel, or belly button.

Once the umbilical cord is cut, the baby's body must take over all life processes. Shortly after birth, the baby begins to cry. This crying replaces the fluid in the lungs with air and the baby begins to breathe. The baby's circulatory system also changes. The heart starts pumping blood to the baby's lungs. The blood then returns to the heart for circulation to the rest of the body.

Without the umbilical cord, the baby needs a new supply of food. Hormones in the mother cause mammary glands in her breasts to produce milk. Almost all babies are able to start nursing soon after birth.

Think & Discuss

6. What is fertilization? Where does fertilization take place?
 7. What is one major difference between an embryo and a fetus?
 8. Explain how an embryo receives food and oxygen.
 9. What two functions do the contractions of labor serve?
 - ★ 10. What would happen to the fetus if the placenta became detached from the uterine wall? Explain your answer.
6. the union of a sperm cell and an egg cell; in the oviduct
 7. The embryo skeleton is made up mostly of cartilage, while the skeleton of a fetus is made mostly of bone.
 8. Food and oxygen diffuse across blood vessels in the uterine wall to vessels in the placenta. The nutrient-rich blood is carried to the embryo by the umbilical vein.
 9. to open the cervix and to push the baby out of the mother's body
 10. The placenta would not receive a constant supply of food and oxygen and remove wastes. As a result, the fetus would die. (Hypothesizing)

25-3 Human Development

Human development occurs in a series of stages that begin at birth and continue through old age. At birth, all of the major body systems and organs are in place. However, it often takes years before all of these systems and organs are fully developed and function efficiently.

Key Points

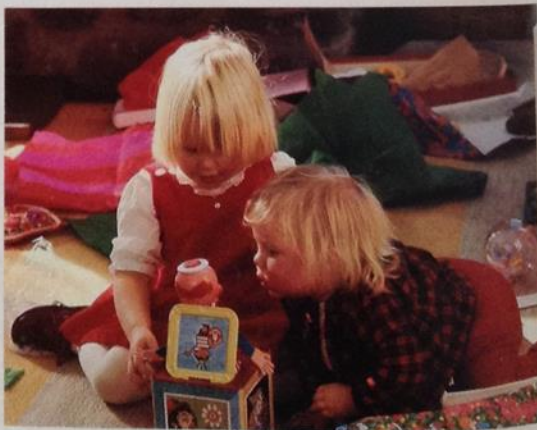
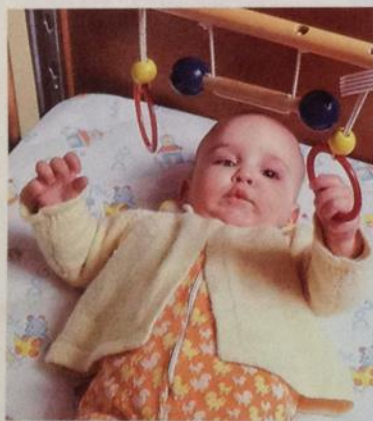
- The human life cycle includes several stages of development.
- Adolescence is marked by increased height, weight gain, and sexual maturity.

Skill Builder

Sequencing When you sequence, you list events in the correct order. After you finish reading the section on human development, prepare a table listing the stages in the human life cycle. Record the age range and physical traits of each stage.

Female newborns are more responsive to touch, sound, and odors than are male newborns. Male newborns are more responsive to visual stimuli.

Figure 25-11 An infant (left) begins to notice her surroundings. During childhood (right) coordination increases.



▲ The stages in the development of an organism are described as its life cycle. The stages of the human life cycle include infancy, childhood, adolescence, adulthood, and old age. Certain events that occur at different times in the life cycle make each stage unique.

Early Years

At birth, human newborns are totally helpless. The range of their abilities includes crying, sucking, swallowing, and grasping. Babies usually can see things that are within about 50 cm of them. They usually respond to sudden loud noises or bright lights with a startle reflex. Babies also have other simple reflexes, such as blinking their eyes.

The earliest stage of human life is called infancy. Muscle and nerve development occur rapidly during infancy. By seven months, an infant usually can hold its head up, roll over, and perhaps even crawl. By the time they are one year old, most infants are able to walk and to speak a few words.

Infants between the ages of one and two are very curious about their environment. They place almost everything they pick up in their mouths for a closer inspection. During this period, infants also become aware of the results of their actions. For example, infants realize that certain actions get the attention of adults.

Childhood generally is defined as the period between ages 2 and 12. During this time, children become better

able to express their thoughts. The development of reasoning develops more complex thought. Children learn to feed and dress themselves. Most children learn to walk during the stage of development. They can perform activities such as playing a game.

Between the ages of two and twelve, children go through a period called adolescence. Puberty takes place. At puberty, the body becomes more mature and begins to produce sex hormones. These hormones cause the body to grow. Young people grow taller. Boys begin to develop facial hair. In addition, their physical development and mental development continue.

Adolescents can reproduce at this time. Boys begin to produce sperm. Girls begin to produce eggs.

Later Years

Adulthood is the stage of the human body when development is completed between adolescence and adulthood and reproduction. Between the ages of 18 and 30, physical strength often decreases. People begin to stay "in shape" by exercising.



able to express themselves. Their vocabulary and powers of reasoning develop. Increased muscle development allows more complex activities. Children soon are able to feed and dress themselves, and even to ride a bicycle. Most children learn how to read and write during this stage of development. Children at this stage are able to perform activities that require a great deal of coordination, such as playing a sport or a musical instrument.

Between the ages of 11 and 14, most young people go through a period of rapid physical change. This stage is called adolescence. During early adolescence, puberty takes place. At puberty, the testes and ovaries become mature and begin to release high levels of hormones. These hormones largely are responsible for growth spurts. Young people grow taller and gain weight during this time. Boys begin to develop more muscle and body hair. In addition, their voices begin to change. In girls, breast development and a widening of the hips occurs.

Adolescents of both sexes develop the ability to reproduce at this stage in their lives. Boys begin to produce sperm. Girls begin to release mature eggs.

Later Years

Adulthood is the stage at which the physical growth of the human body is complete. The growth process usually is completed between the ages of 18 and 21. Muscle development and coordination reach their peak in early adulthood and remain at that level through the late 20s. Between the ages of 30 and 50, muscle tone and physical strength often decrease. As a result, people find it harder to stay "in shape."



Health and Safety Tip

Long-term use of marijuana affects the production of sex hormones. Men who use marijuana have a lowered sperm count. Women experience disruptions in their menstrual cycles.

Both males and females experience growth spurts during adolescence. On average, males grow to be 10 percent taller than females.

Figure 25-12 Regular exercise helps these young adults stay in shape.



Figure 25-13 Many older adults remain active throughout their lives.

Estrogen provides women with a built-in health advantage over men. It keeps the blood vessels of a woman more pliable, which reduces the risk of atherosclerosis.

11. the stages in the development of an organism; infancy, childhood, adolescence, adulthood, and old age.
12. increase in height, increase in weight, and sexual maturity
13. Development during infancy seems to be the opposite of changes that take place during old age. Infancy is characterized by rapid muscle and nerve development. Old age often is accompanied by a loss of muscle strength and decreased sensitivity to nerve stimuli. (Comparing)

Between the ages of 45 and 50, the release of egg cells in women begins to decrease. The menstrual cycle occurs less frequently. By age 50, menstruation has usually stopped completely. However, men do not stop producing sperm. Men continue to produce sperm until they are in their late 80s and early 90s.

Old age, or the beginning of the aging process, occurs at different times in different people. People who have exercised regularly and eaten a balanced diet all of their lives may not show signs of aging until their late 70s or early 80s. On the other hand, people who rarely have exercised and lacked a balanced diet throughout their lives can show signs of aging in their early 60s. What are some of the aging signs?

Your sense organs contain large numbers of sensory receptors. With advancing age, these receptors become less sensitive to stimuli. Older adults usually do not hear or see as well as they once did. They become less able to taste different foods or to smell odors.

Older adults usually notice a loss of muscle strength. They tend to move slowly. Some may even require assistance in moving. Their bones often become soft and even brittle. Bones break more easily and take longer to heal in older adults. Most older adults decrease in height as their bones begin to curve and the cartilage between the bones loses its elastic quality.

Americans are living longer now than at any other period in history. In the 1940s, men usually lived to be 64 and women to be 68. By the 1980s, men were living to age 72 and women to age 78. Many of the factors affecting the aging process are controlled by your genes. However, research has shown that a balanced diet and regular exercise can contribute greatly to the quality of your life as you grow older.

Think & Discuss

11. What is a life cycle? List the stages in the human life cycle.
12. What three major events occur during adolescence?
13. Compare development during infancy with the changes that take place during old age.

BIOLOGY

Fetal M

Until recently, no way of diagnosing the health of an unborn baby. Then the development of an important medical procedure made the diagnosis of fetal health possible. These two procedures are amniocentesis and ultrasound.

In amniocentesis, a needle is inserted into the amniotic sac in the abdomen and a sample of the fluid in which the fetus floats is removed. The fluid is then analyzed to determine the health of the fetus. As many of its genes are known, using amniocentesis can tell if a fetus has certain genetic disorders.

Ultrasound is a procedure in which sound waves are sent through the mother's body. The sound waves bounce off the fetus and create an image of the fetus on a television screen. Ultrasound pictures can be used to diagnose medical problems in fetuses. They also provide very accurate pictures of the fetus's position in the uterus.

Scientists have developed a new technique in medicine that may be more effective than amniocentesis and ultrasound. Using this technique, a doctor can treat a fetus by passing a thin needle into the uterus.

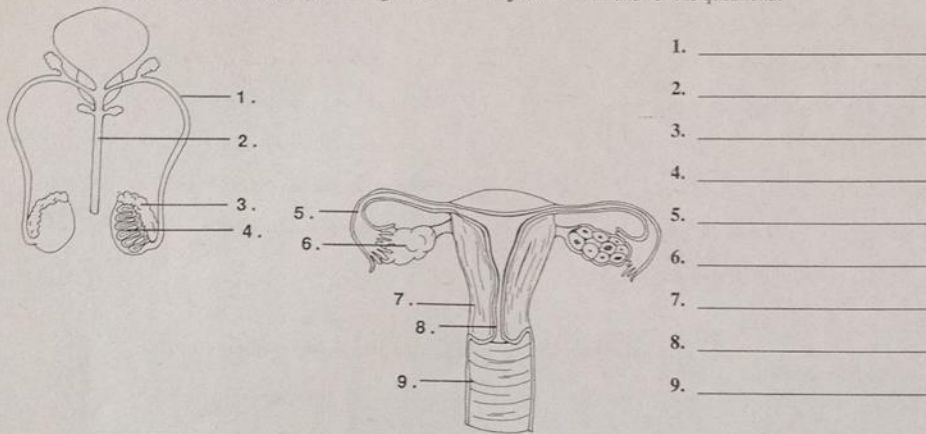
Name _____ Class _____ Date _____

Chapter 25 Reproduction and Development

Section Review 25-1

Human Reproductive Systems

Part A: Label the parts of the male and female reproductive systems. Use these terms: *cervix, epididymis, ovary, oviduct, testis, urethra, uterus, vagina, and vas deferens*. Then answer the questions.



1. _____
 2. _____
 3. _____
 4. _____
 5. _____
 6. _____
 7. _____
 8. _____
 9. _____
10. What structure holds the testes? _____
 11. What is another name for the uterus? _____
 12. What structure surrounds and protects the urethra in the male reproductive system?

Part B: Write the name of the hormone that relates to each statement. Use *estrogen, progesterone, or testosterone*.

Table 1 Hormones of the Reproductive System

Description	Hormone
1. Responsible for the onset of puberty in males	
2. Causes the walls of uterus to begin to thicken	
3. Causes sperm to develop	
4. Causes a deeper voice to develop	
5. Decreased amounts cause menstruation	

Name _____ Class _____ Date _____

Chapter 25 Reproduction and Development

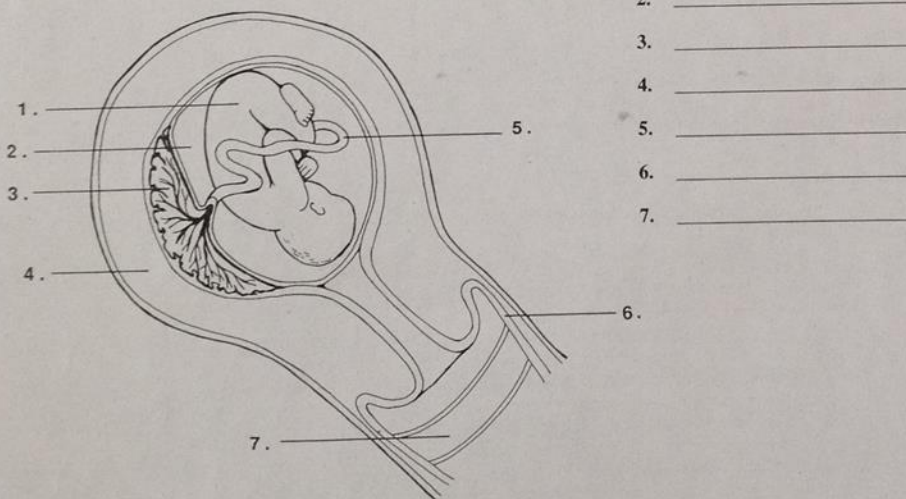
Section 25-2

Human Reproduction

Part A: Read each statement. In the space provided, number the statements in the correct order.

- | | |
|--|---|
| ____ Umbilical cord is cut. | ____ Fertilization occurs. |
| ____ Hormones cause labor to begin. | ____ Zygote undergoes a series of cell divisions. |
| ____ Zygote travels through oviduct to uterus. | ____ Bone replaces cartilage in embryo. |
| ____ Birth of baby | ____ Fetus moves into head-down position. |
| ____ Placenta forms. | ____ Embryo attaches to wall of uterus. |
| ____ Baby carries on its own life processes. | ____ Contractions push placenta out of mother's body. |
| ____ Body systems develop, arms and legs get longer. | |

Part B: Label the diagram of the developing baby. Use these words: *amnion, birth canal, cervix, fetus, placenta, umbilical cord, and uterus.*



Name _____

Chapter 25 Reproduction and Development

Section 25-2 Human Reproduction (continued)

Part C: Answer the questions in the spaces provided.

1. What is fertilization? _____

2. What prevents more than one sperm from entering the egg? _____

3. What is the function of the placenta? _____

4. How do substances move from the blood vessels to the placenta? _____

5. Why should a pregnant woman avoid drugs, alcohol, and tobacco during her pregnancy? _____

6. How long is the gestation period of humans? _____

Part D: Doctors refer to each three-month period of pregnancy as a trimester. Identify the trimester for each event by writing the numbers 1 (first three months), 2 (second three months), or 3 (last three months) in the spaces provided.

- ____ a. Fetus gains a lot of weight
- ____ b. Heart, brain, and nerve cord begin development
- ____ c. Bone begins to replace cartilage in embryo
- ____ d. Arms and legs of fetus grow longer
- ____ e. Fetus develops layer of protective fat
- ____ f. Mother begins to gain weight
- ____ g. Fetus prepares for birth by turning itself upside-down
- ____ h. Fetus increases in size.

Name _____ Class _____ Date _____

Chapter 25 Reproduction and Development

Section Review 25-3

Human Development

Part A: Place the letter of each statement under the stage of the human life cycle that it describes. You will use some letters more than once.

Infancy	Childhood	Adolescence	Adulthood	Old Age

- | | |
|---|--|
| a. Some organs are not fully developed. | f. Ability to reproduce. |
| b. Physical growth is completed. | g. Sense receptors get weaker. |
| c. Puberty takes place. | h. Cartilage loses its elasticity. |
| d. Vocabulary develops. | i. Powers of reasoning develop. |
| e. Muscle development is completed. | j. Muscle and nerve development occur rapidly. |

Part B: Answer each question in the space provided.

1. What are some signs of aging? _____

2. What are some ways the aging process can be slowed? _____

3. How would you compare the changes that take place during infancy with those of old age? _____

4. How do the bones change during old age? _____

5. Why do males and females go through a period of rapid physical change between the ages of 11 and 14? _____

Name _____ Class _____ Date _____

Chapter 25 Reproduction and Development

Vocabulary Review

Part A: Write the word described by each statement in the spaces provided.

1. Lower end of the uterus _____
2. Means by which sperm are released _____
3. Thick, flat, structure which carries away wastes and receives food and oxygen from mother _____
4. Process by which the tissue lining and blood leave the uterus _____
5. Produce egg cells _____
6. Coiled tube in which sperm are stored _____
7. The stage when a person becomes sexually mature _____
8. Development of an organism within its mother's body _____
9. Union of a sperm and an egg _____
10. Membrane that surrounds and protects the embryo _____
11. Rope-like structure that connects the embryo to the placenta _____
12. Tube-like structure that protects the urethra _____
13. Tube through which an egg travels to the uterus _____
14. Produce sperm cells _____
15. Fertilized egg _____
16. Birth canal _____
17. Womb _____
18. Pocket of skin that holds testes _____

Part B: Unscramble the circled letters in the words to discover two science words related to this chapter. In the space provided, write a definition for each word.

1. _____

2. _____
