What Is This Module About?

The life cycle of every organism involves being born, growing up, reproducing, aging and finally dying.

Do you know any couple whose children are all girls/boys? What do you think are the odds of this happening? What is the proportion of boys to girls among children being born at present?

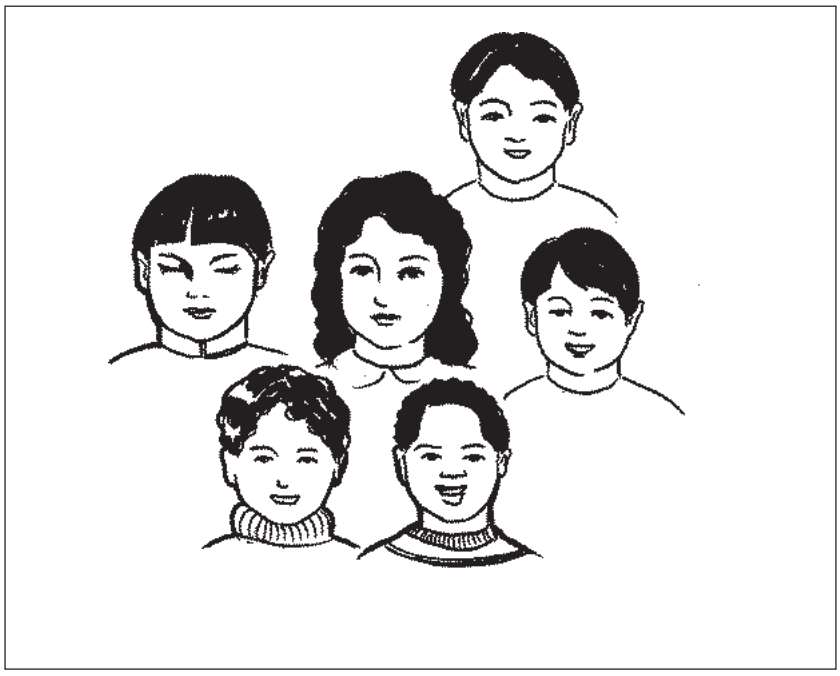
This module will teach you all about the structure and functions of the male and female reproductive systems. It will also tell you about the development of a human being from fertilization to old age.

This module is made up of three lessons:

Lesson 1 — *Human Reproduction*

Lesson 2 — *From Fertilization to Birth*

Lesson 3 — *Development After Birth*



Children of different races

What Will You Learn From This Module?

After studying this module, you should be able to:

- explain the functions of the reproductive system and its parts;
- describe the structures of both the male and female reproductive systems;

- describe the changes that take place during fetal development; and
- describe the physical/mental changes that occur as humans age.

Let's See What You Already Know

Before you start studying this module, take this simple test first to find out what you already know about the topics.

Encircle the letter of the correct answer.

1. After three months of being in the mother's womb, the fetus _____.
   a. is ready to be born
   b. has developed a large body and a tiny head
   c. looks like a tiny adult
   d. has developed all its organ systems but still cannot live on its own

2. To lead healthy, active lives in old age, one should _____.
   a. eat properly and exercise regularly
   b. have parents who lived healthy, active lives
   c. enjoy life
   d. all of the above

3. During puberty _____.
   a. great amounts of sex hormones are produced
   b. A person's hands and feet grow bigger
   c. A person's body changes shape
   d. all of the above

4. The menstrual cycle stops during _____.
   a. ovulation
   b. puberty
   c. adolescence
   d. pregnancy

5. Sex cells are produced in the _____.
   a. ovaries and testes
   b. uterus and penis
   c. brain and pituitary gland
   d. oviducts and semen

6. A woman is pregnant when _____.
   a. ovulation occurs
   b. fertilization occurs
   c. a cell mass attaches itself to the wall of her uterus
   d. the heartbeat of the fetus begins to be heard

7. The union of an egg cell and sperm cell is called _____.
   a. fertilization
   b. ovulation
   c. menstruation
   d. puberty

8. The ability to reproduce begins at _____.
   a. adolescence
   b. adulthood
   c. childhood
   d. infancy

9. The embryo develops in the _____.
   a. fallopian tube
   b. ovary
   c. uterus
   d. vagina

10. The only sexually related change common to both males and females is _____.
   a. developing breasts
   b. having bigger muscles
   c. getting fat
   d. growing pubic hair

Well, how was it? Do you think you fared well? Compare your answers with those in the *Answer Key* on page 35 to find out.

If all your answers are correct, very good! This shows that you already know much about the topics in this module. You may still study the module to review what you already know, who knows you might learn a few more new things as well.

If you got a low score, don't feel bad. This means that this module is for you. It will help you understand some important concepts that you can apply in your daily life. If you study this module carefully, you will learn the answers to all the items in the test and lot more! Are you ready?

You may go now to the next page to begin Lesson 1.

LESSON 1

Human Reproduction

Reproduction is important because without it people as well as every living organism would vanish from the earth. This lesson will inform you on:

- the functions of the reproductive system;
- the major parts of both the male and female reproductive systems;
- the function of each part of both the male and female reproductive organs; and
- the stages of the menstrual cycle.

Let's Try This

Answer the following questions briefly.

1. What are sex cells and on what part of the male and female organ are they produced?

   _____

   _____

   _____

2. What are the major parts of the male reproductive system? the female reproductive system?

   _____

   _____

   _____

   _____

   _____

3. What is the menstrual cycle?

   _____

   _____

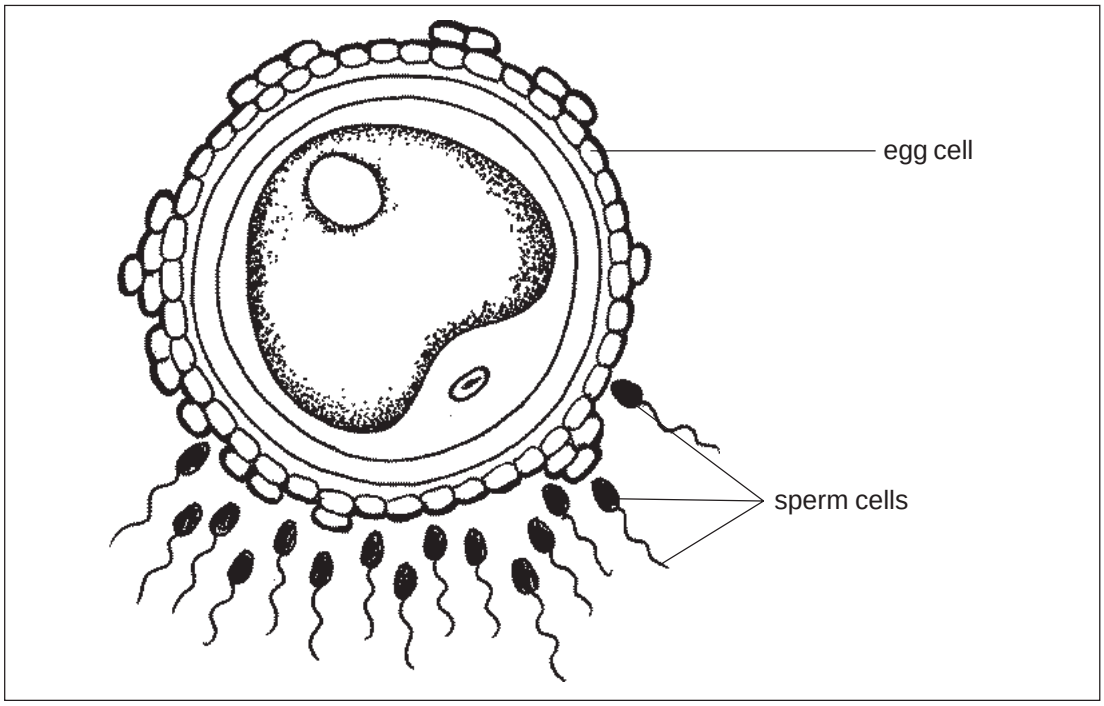
   _____

Find out about all these and more by studying this lesson carefully.

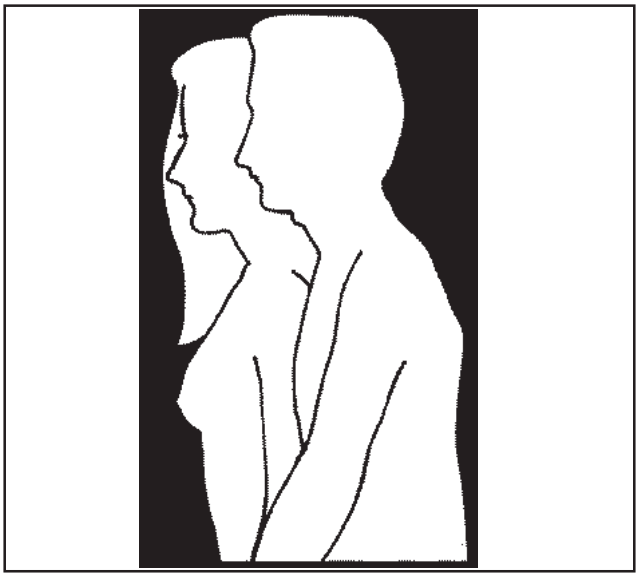
Let's Learn

What Is Reproduction?

The picture below shows an egg cell surrounded by many sperm cells. These cells are the human sex cells needed for reproduction. Males produce sperm cells in their testes while females produce egg cells in their ovaries. An egg cell and a sperm cell unite during the process called **fertilization**. Under normal conditions, the fertilized egg can grow and develop into a baby.

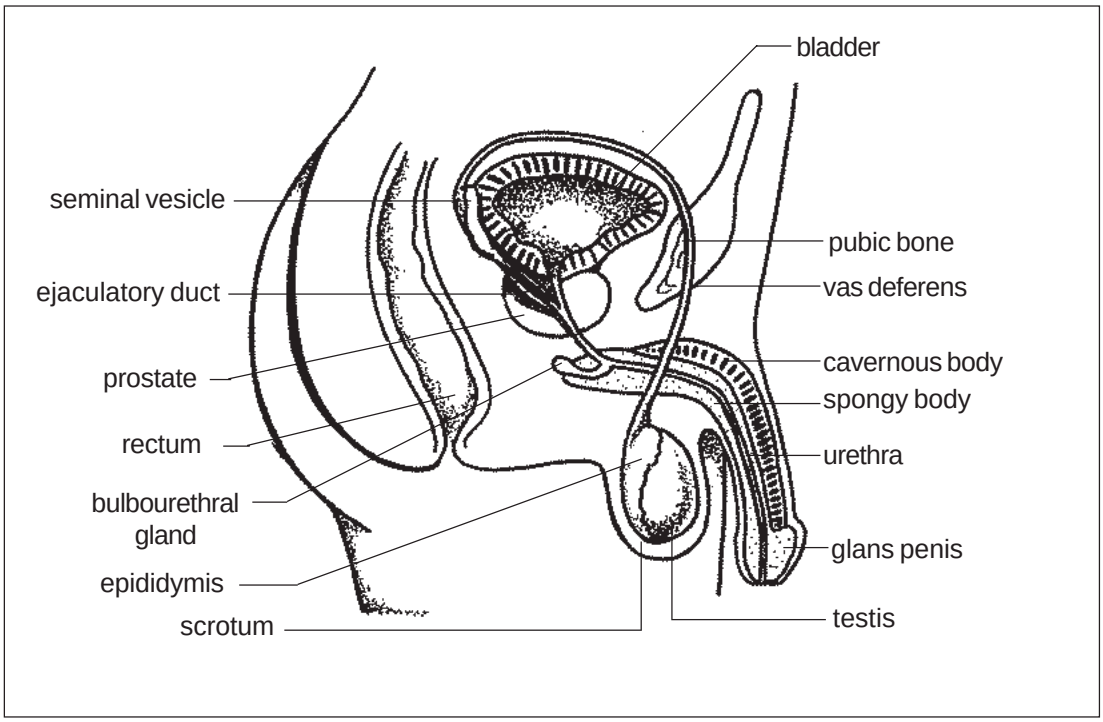


Men and women have different roles in the process of reproduction. Between the ages of 10 to 16, the bodies of girls and boys change as their reproductive systems develop.



The Male Reproductive System

Look at the diagram of the male reproductive system below and study its parts. It has two main parts: the **testes** that produce **sperm cells** or the male sex cells and the **ducts** or tubes that carry these sex cells.

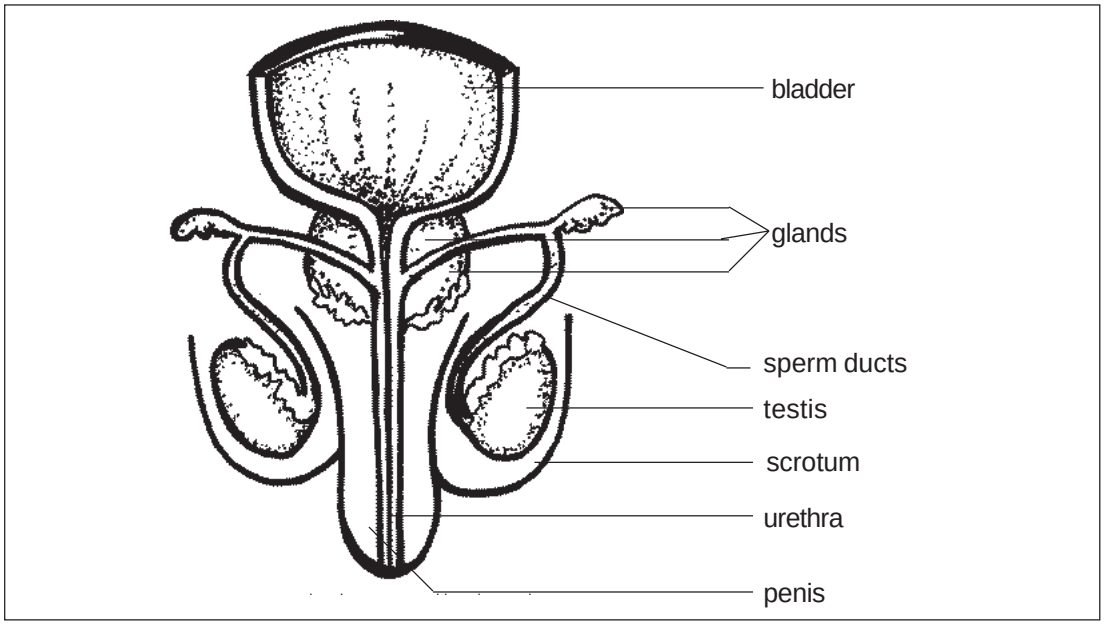


What do we call the external organs of male?

The external organs of the male reproductive system are the penis and the scrotum. The **penis** is the male organ used during sexual intercourse to transfer sperm to the female reproductive tract. The testicles are the two reproductive glands that produce sperm and are either internally or externally positioned. It also contains the **urethra** through which urine passes. Behind it is the **scrotum**, a sac of skin that encloses the testicles. In the **testicles,** sperm cells cannot survive at regular body temperature but they can survive at the slightly cooler temperature within the scrotum.

How are the sperm cells transported from the male reproductive system to the female reproductive system?

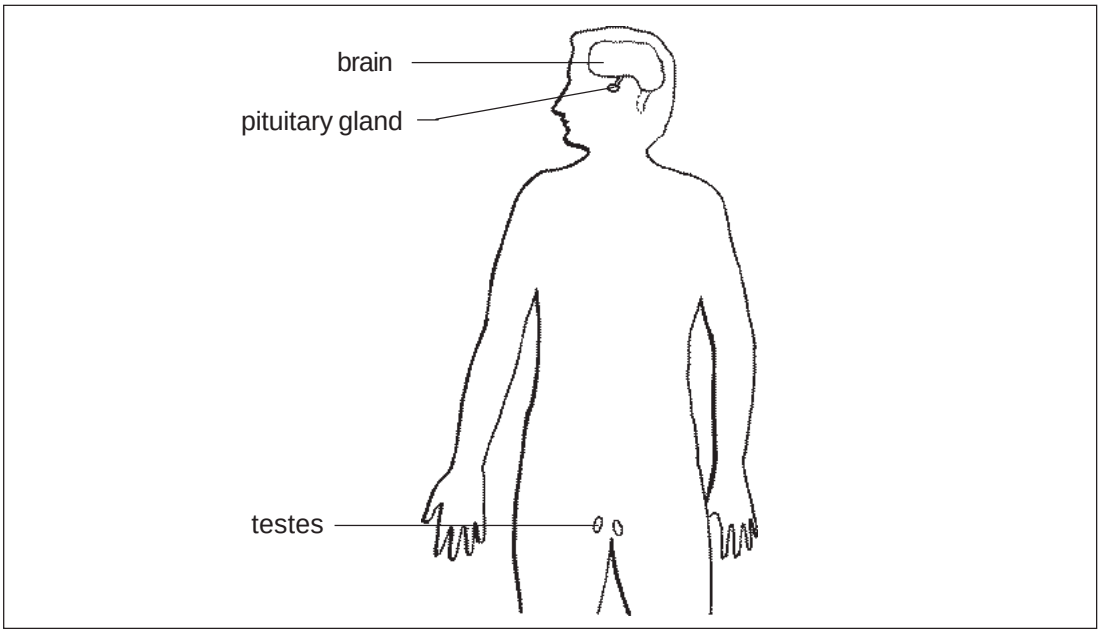
Many organs help in producing, transporting and storing sperm cells inside the male body. After sperm cells are produced, they travel from the testes through a tube called **epididymis** that circles the bladder. The **sperm ducts** allow the sperm cells to pass from the testes to the penis then outside the male's body. In the diagram on the next page, you can follow the ducts from each testes to the urethra. The **urethra** is where the **ejaculatory ducts** empty.



The male reproductive system also has various glands. The chemicals from these glands nourish the sperm cells and help them mature. Do you know that sperm cells can be likened to swimmers? Millions of sperm cells that are produced every day in the testes swim in a fluid called **seminal fluid** that comes from the sperm ducts. As the sperm cells move through the ducts, chemicals from the glands are added to the fluid. Together the fluid, sperm cells and chemicals called **semen** leave the body during sexual intercourse.

How are the production of sperm cells and the release of semen regulated?

The production of sperm cells and the release of semen can be regulated by **hormones** or special chemicals that come from the testes, the brain and the pituitary gland (refer to the diagram below). These hormones keep the reproductive system functioning properly.



Let's Review

Answer the following questions briefly.

1. Where are sperm cells produced?

   _____

2. What are the major parts of the male reproductive system? Give the function of each.

   _____

   _____

   _____

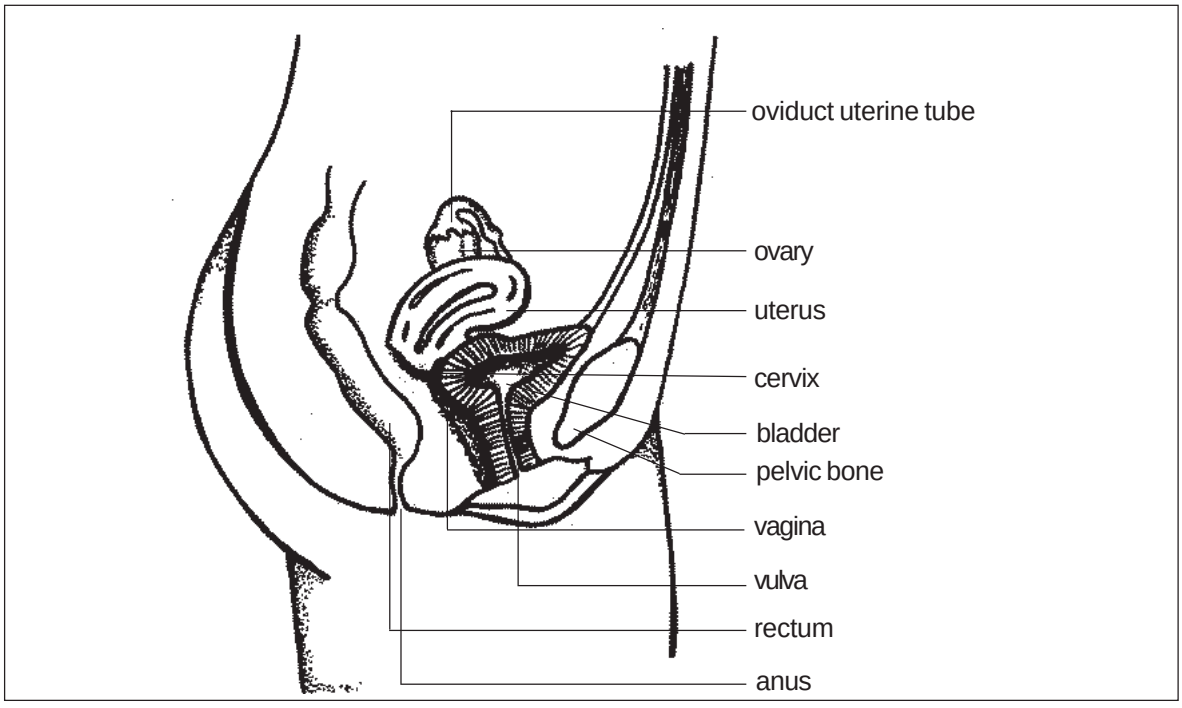
   _____

   _____

Compare your answers with those in the *Answer Key* on page 35. Did you get a perfect score? If you did, that's very good. If you did not, that's okay. Just review the parts you missed before going to the next part of the lesson.

Let's Learn

The Female Reproductive System

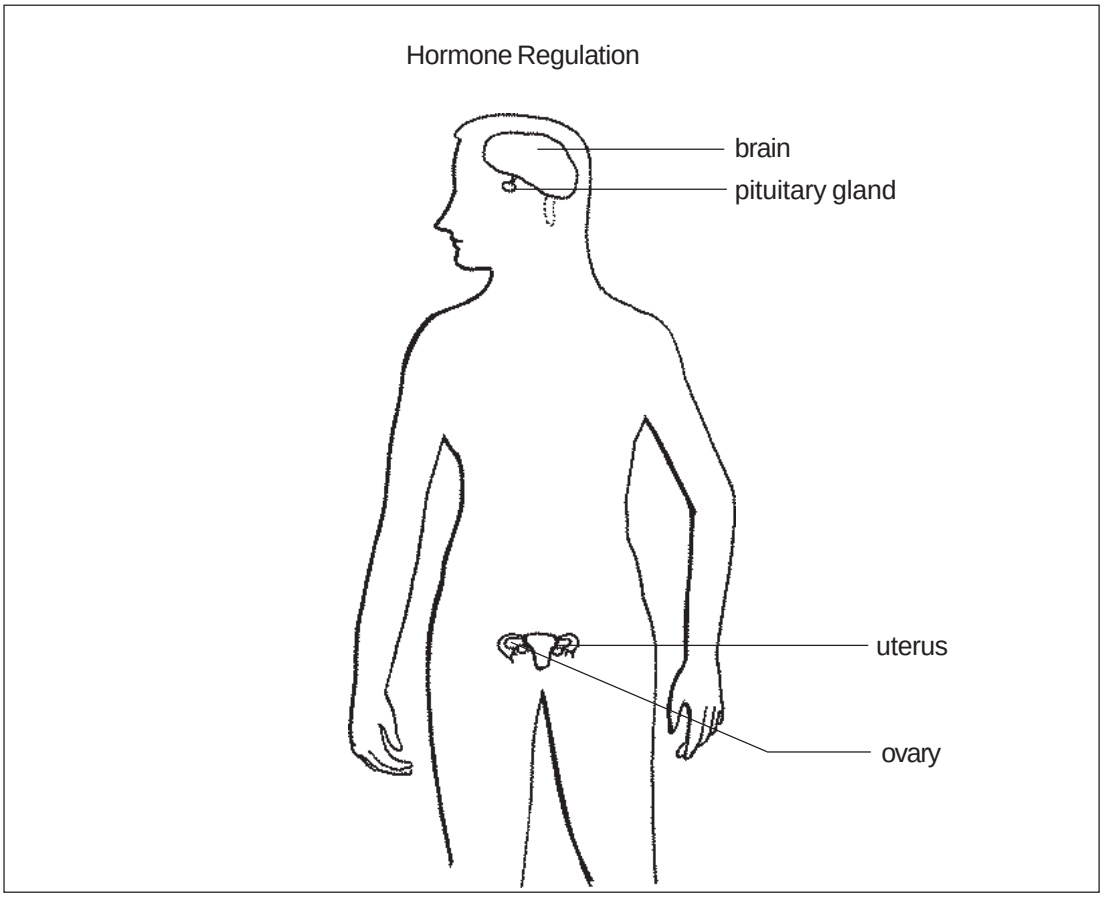


Look at the diagram of the female reproductive system on page 8 and study its parts. When a female reaches puberty, egg cells start to develop in her **ovaries** which produce the sex cells. Generally, only one egg cell matures at a time. The ovaries lie deep within the abdomen.

When a mature egg is released from an ovary, **ovulation** occurs. The released egg travels through an **oviduct,** a tube connected to a **fallopian tube** which allows the egg to go to either the uterus or outside the female's body. The **uterus** is a small, muscular, pear-shaped organ that lies between the ovaries. A fertilized egg can grow and develop in it. The muscular walls of the uterus stretch as the fertilized egg divides and grows.

If an egg fails to become fertilized, it leaves a female's body through an opening called the **vagina**. This is not the vagina's only function though. It is also where a baby passes through during birth.

The female reproductive system, just like the male reproductive system, is also regulated by hormones. The organs to its left produce hormones that control the growth and release of eggs from the ovaries.While other hormones prepare the uterus so a baby can grow in it. Still other hormones control the stretching of the uterus during pregnancy.



Did You Know That . . .

at birth, the ovaries contain an estimated 400,000 immature eggs. Of these, only about 400 will ever reach maturity.

Let's Review

Answer the following questions briefly.

1. Where are egg cells produced?

   _____

2. What are the major parts of the female reproductive system? Give the function of each.

   _____

   _____

   _____

   _____

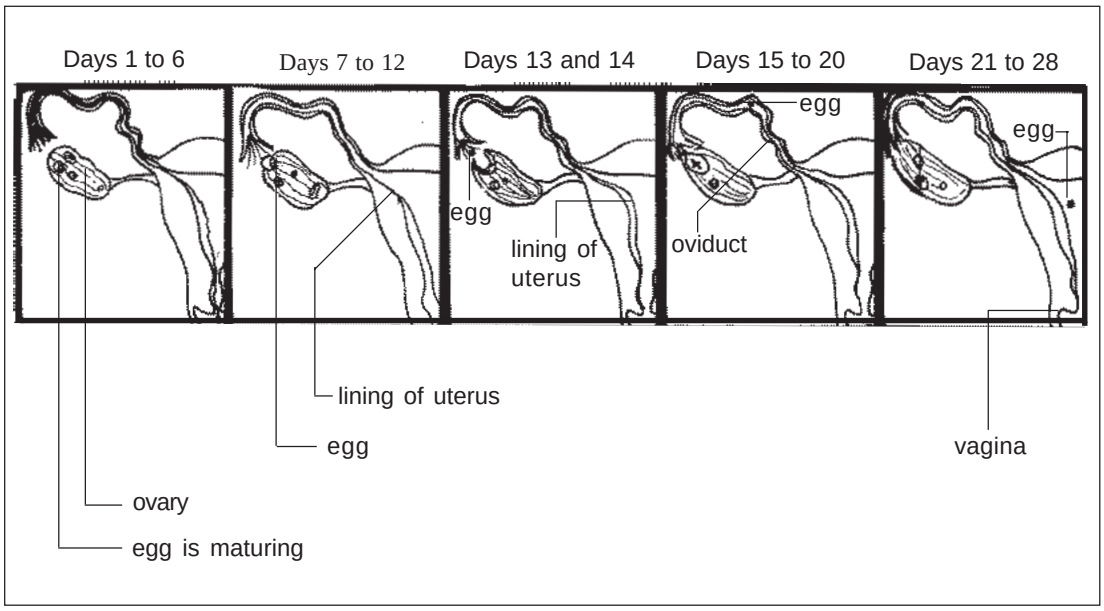
   _____

Compare your answers with those in the *Answer Key* on page 35. Did you get all the answers right? If you did, proceed to the next part of the lesson. If you did not, don't worry. Just review the parts you missed before going to the next part of the module.

Let's Learn

The Menstrual Cycle

The female reproductive system undergoes a monthly cycle of changes called the **menstrual cycle.** It involves the growth and release of a mature egg. Refer to the diagram on page 11 to further understand the stages of this cycle.



On the first day of the menstrual cycle, a hormone signals an immature egg to begin to mature. A few days later, other hormones signal the lining of the uterus to grow and thicken. In about two weeks, the egg is mature and ovulation occurs. The egg then takes a three-day journey through the oviduct.

After reaching the uterus, the egg and the thick lining of the uterus begin to break down. The egg and uterus lining are shed from the body through the vagina as the **menstrual flow.** The blood in the menstrual flow results from the breakdown of capillaries in the lining of the uterus. It is a normally safe development. This period of menstrual flow is called **menstruation.** It usually lasts three to five days. In some women it is shorter and in others it is longer. When menstruation begins, hormones trigger another egg to mature. Thus, the cycle is repeated.

The length of the menstrual cycle varies from woman to woman. In some women the cycle is repeated every 21 days or so. In other women, a normal cycle may be 35 days or so. The average cycle is 28 days. Keeping good record of the days can help a woman learn her normal cycle.

If a mature egg and sperm are in an oviduct at the same time, the egg and sperm may unite. If this happens, the fertilized egg divides, continues to the uterus and burrows into the thick lining of the uterus. When this happens a woman becomes pregnant and the menstrual cycle stops.

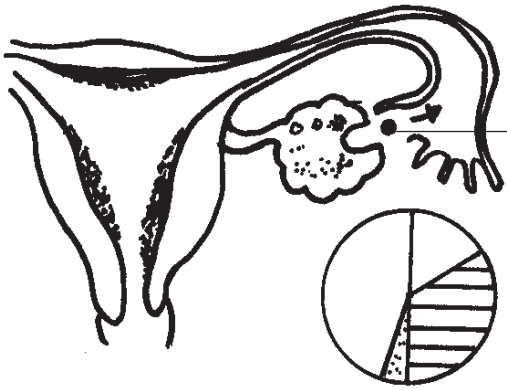
A girl can start menstruating between the ages 10 to 15 and will continue doing so until the ages 45 to 51. **Menopause** is the period in a woman's life when menstruation stops and pregnancy is no longer possible.

Let's Review

Arrange the illustrations below according to the stages of the menstrual cycle. Number them 1 to 5.

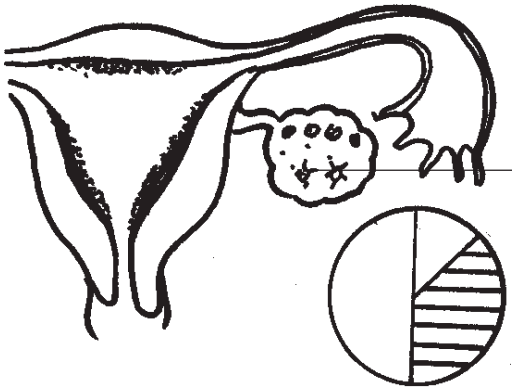
Menstrual Cycle

_____ a.



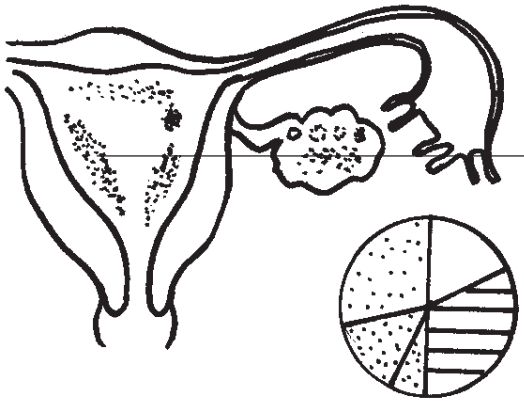
ovulation occurs

_____ b.



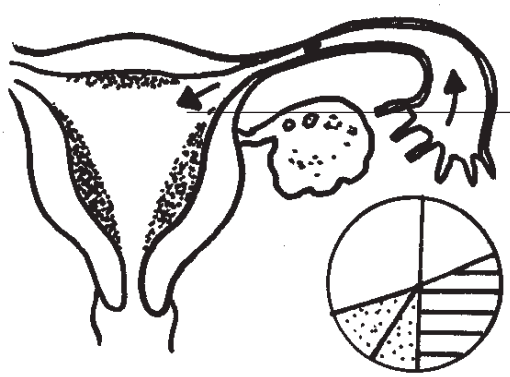
lining grows and thickens; egg begins to mature

_____ c.



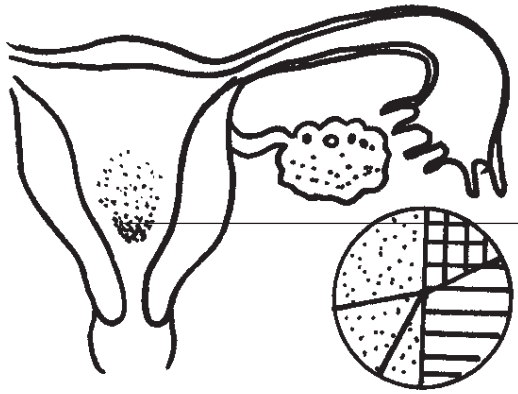
egg and lining begin to break down

——— d.



egg travels
through oviduct

——— e.



menstruation occurs

Compare your answers with those in the *Answer Key* on page 36. Did you get a perfect score? If you did, that's very good. If you did not, that's okay. Just review the parts you missed before going to the next part of the lesson.

Let's See What You Have Learned

Match the words in Column A with their descriptions in Column B. Write the letters of the correct answers only in the blanks before the numbers.

Column A		Column B	
_____	1. Fertilization	a.	The process wherein an egg cell and a sperm cell unite
_____	2. Sperm cell	b.	The period in a woman's life when menstruation stops and pregnancy is no longer possible
_____	3. Penis	c.	The male sex cells
_____	4. Scrotum	d.	The period of menstrual flow
_____	5. Ovulation	e.	The male organ used during sexual intercourse to transfer sperm to the female reproductive tract
_____	6. Egg cells	f.	The monthly cycle of changes which involves the growth and release of a mature egg
_____	7. Vagina	g.	The sac of skin that encloses the testicles
_____	8. Menstrual cycle	h.	The opening that allows an unfertilized egg and urine to exit a female's body
_____	9. Menstruation	i.	The process of releasing a mature egg from the ovary
_____	10. Menopause	j.	The female sex cells

Compare your answers with those found in the *Answer Key* on page 36. Did you get a perfect score? If you did, you may proceed to the next lesson. If you did not, go back to the items you missed before going to Lesson 2.

Let's Remember

- Reproduction is important because without it people as well as every living organism would vanish from the earth.
- **Fertilization** is the process wherein an egg cell and a sperm cell unite.
- **Sperm cells** are the male sex cells while **egg cells** are the female sex cells.
- Hormones help regulate the production and release of sex cells.
- The **menstrual cycle** involves the growth and release of a mature egg.
- **Menopause** is the period in a woman's life when menstruation stops and pregnancy is no longer possible.

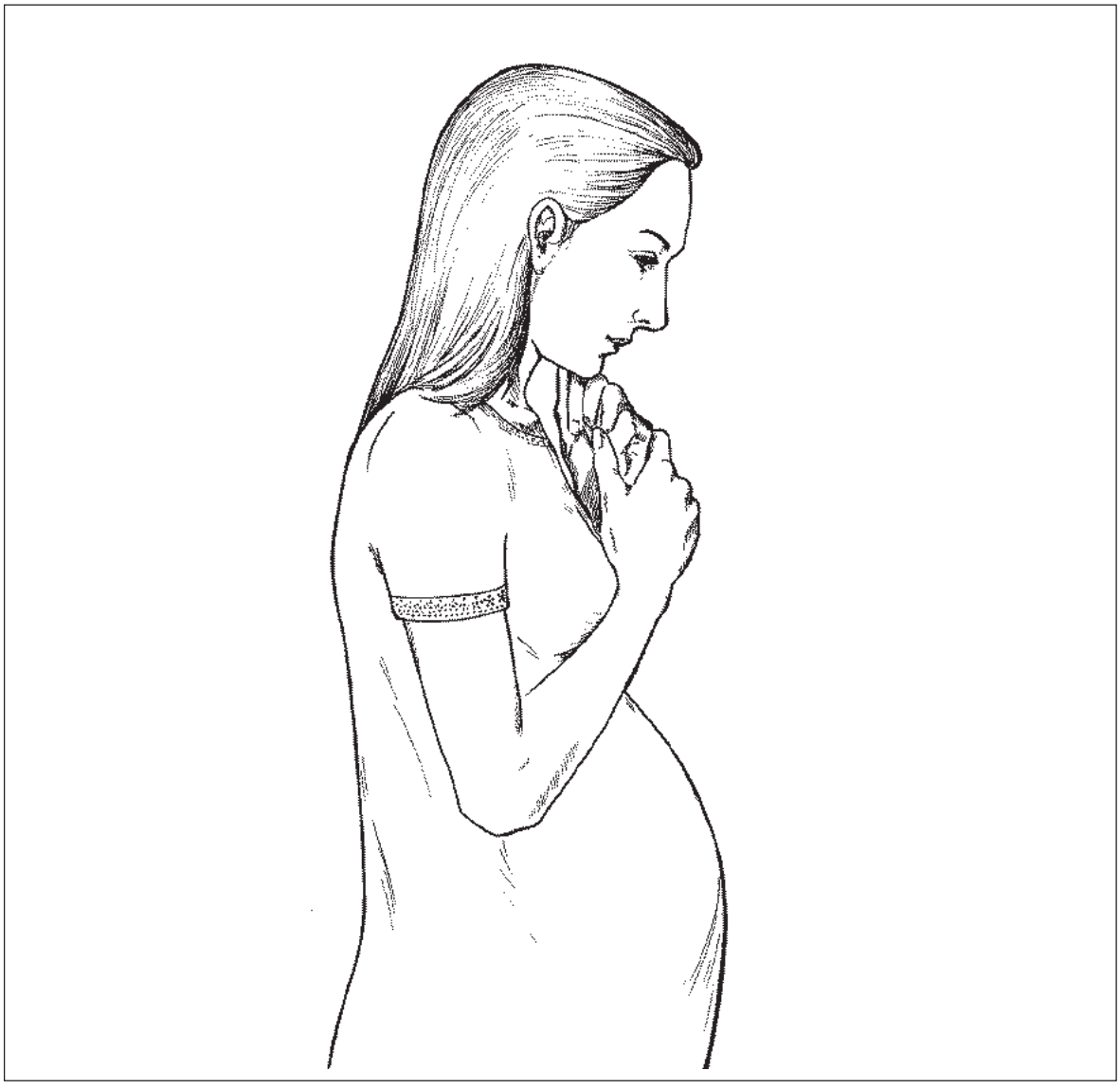
LESSON 2

From Fertilization to Birth

You may have recently heard that someone you know is pregnant. At that time, you may not have noticed anything different about the mother-to-be. But as the months went by you saw the changes in her appearance. What happens within the body of a pregnant woman?

After studying this lesson you should be able to:

- describe how an egg becomes fertilized and
- identify the major events in the stages of development of an embryo and a fetus.



Let's Think About This

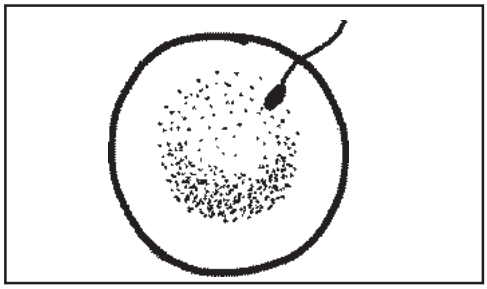
Imagine what happens inside the womb of a pregnant woman. Do you know what changes take place inside her womb in the span of nine months?

Let's Learn

The First Three Months

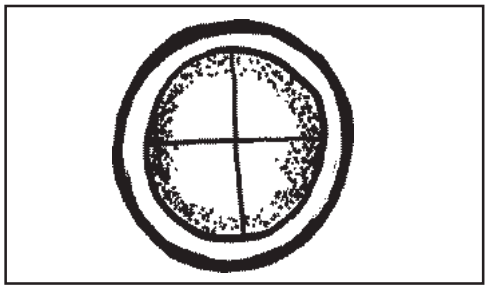
If sperm cells are in an oviduct when the egg cell is moving to the uterus, fertilization may occur. The single cell that results from the union is called a **zygote** or fertilized egg (Step 1).

Step 1

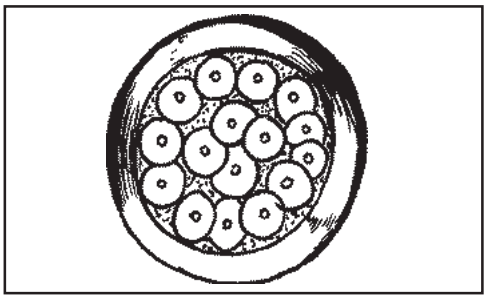


The zygote then divides as it moves through the oviduct (Step 2). Several more divisions take place, forming a small clump of cells (Step 3).

Step 2

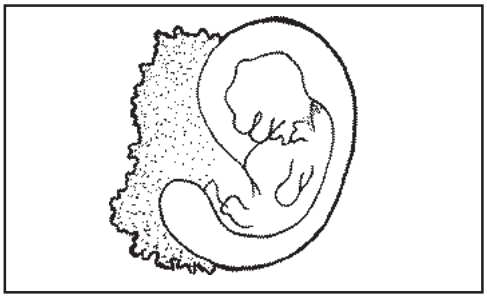


Step 3



About a week after fertilization, the small clump of cells touches and grows into the lining of the wall of the uterus. Some of these cells form the **embryo**, which is a developing organism (Step 4). The process that changes this cell mass into a human baby are called **prenatal development**. **Prenatal** means " before birth."

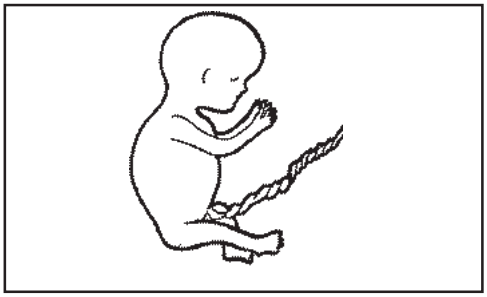
Step 4



The **placenta** forms where the clump of cells grows into the uterus. The placenta contains blood vessels from the pregnant woman and the embryo. Food and oxygen pass from the mother-to-be to the embryo through the placenta. Wastes from the embryo are carried away into the expectant mother's blood through the placenta. The **umbilical cord** is the structure that connects the embryo with the placenta of the mother-to-be.

During the first three months, the head and brain of the embryo develop rapidly but the body is small. Eyes and ears begin to form. Bumps develop where the arms and legs will be. The heart forms and begins to beat. After two months, the embryo is about 5 cm long. It begins to look humanlike and is now called a **fetus**. By the end of three months all the body systems are present but most of them do not function yet. The fetus is about 9 cm long and weighs about 15g.

Step 5



Let's Think About This

The first three months of development are said to be the most sensitive. Why is this so?

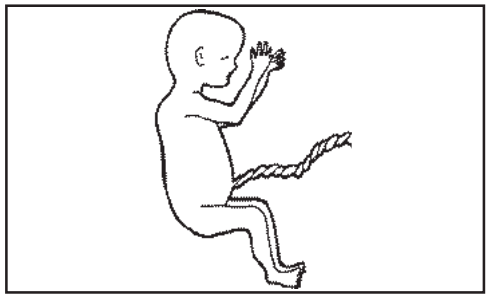
Many things can go wrong during the first three months of development. Nicotine, alcohol and other drugs a pregnant woman may take can harm the embryo. A good diet is very important at this time and throughout the pregnancy.

Let's Learn

The Second Three Months

During the second three months, the growth of the body catches up with the head. Fetal heartbeats can be heard and the developing skeleton can be seen on X rays. Most pregnant women begin to feel the fetus kick. The fetus can even have hiccups. By the end of six months the fetus will be about 30 cm long and can weigh about 700 g. If the fetus is born at this time, it can survive, but only with a great deal of medical help (Step 6).

Step 6



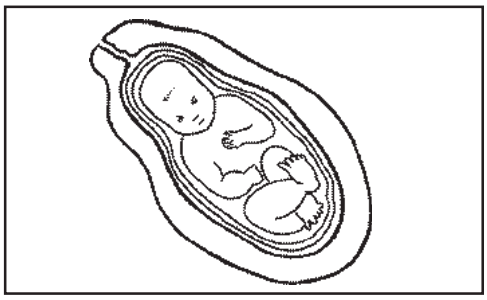
Fetus at six months

This is the time when the fetus puts on a great deal of weight. It gets too large to move freely within its mother's body. The expectant mother can get uncomfortable because the fetus presses on her internal organs.

At this time, the fetus needs large amounts of calcium, iron and protein. These nutrients are necessary for the proper development of bones, blood and nerves. So again, a pregnant woman must continue to be careful about her diet. At the end of nine months the fetus is about 45 cm long and can weigh about 3,000 g (Step 7).

The Last Three Months

Step 7



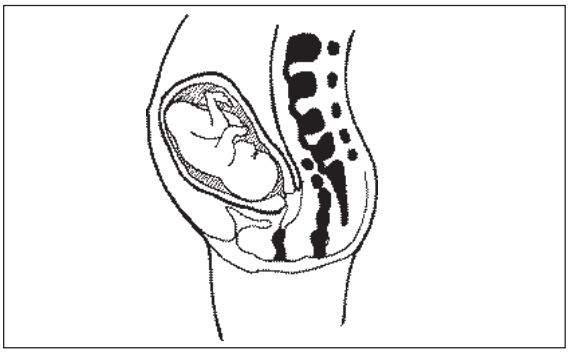
Fetus during the last three months

Let's Try This

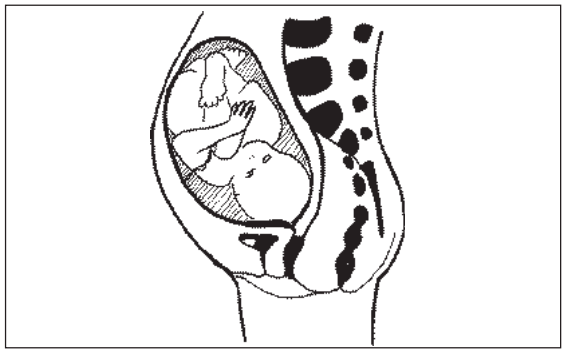
Study the following pictures and determine their proper order. Number them accordingly (**1** for the first stage, **2** for the second and so on).

a. ___

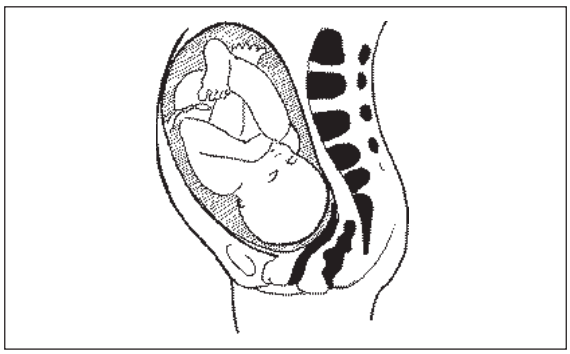
b. ___



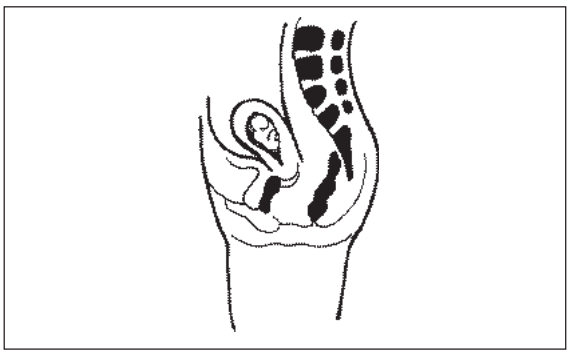
. **c.** ___



d. ___

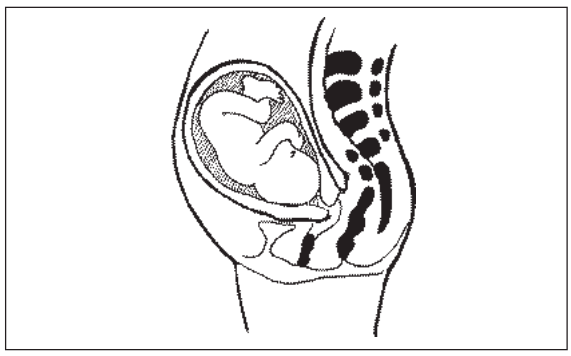


e. ___

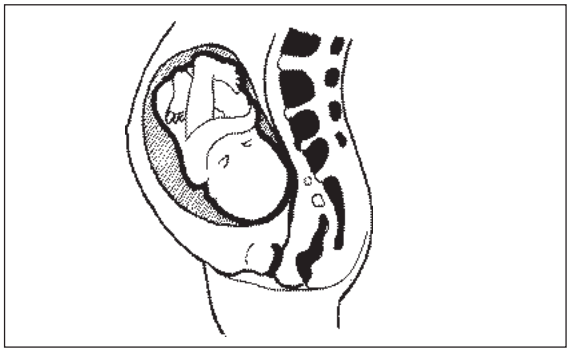


f. ___

g. ___



h. ___



i. ___

Compare your answers with those in the *Answer Key* on page 36. Did you get all the answers right? If you did, that's very good. If you did not, don't worry. Just review the parts you misunderstood before proceeding to the next part of the lesson.

Let's Read

Multiple Births: How Are These Made Possible?

In some cases, two eggs leave the ovary at the same time. If both eggs are fertilized and developed, twins are born. When two different sperms fertilize two different eggs, the two babies are called **fraternal twins**. They may be two girls, two boys or a boy and a girl. If both babies were developed from the same egg and sperm, they are called **identical twins**. They may be either two girls or two boys. These twins look exactly alike.

Let's See What You Have Learned

Enumerate the stages of prenatal development.

1. The first three months

   a. _____

   b. _____

   c. _____

   d. _____

   e. _____

2. The second three months

   _____

   _____

3. The last three months

   _____

   _____

Compare your answers with those in the *Answer Key* on pages 36–37. Did you get a perfect score? If you did, that's very good. You can now go to Lesson 3. If you did not, review the parts you misunderstood first before proceeding to the next lesson.

Let's Remember

- By the end of three months all the fetus' body systems are present. But most of them do not function yet. The fetus will be about 9 cm long and can weigh about 15 g.
- By the end of six months the fetus will be about 30 cm long and can weigh about 700 g. If the fetus is born at this time, it can survive, but only with a great deal of medical help.
- At the end of nine months the fetus is about 45 cm long and it can weigh about 3,000 g.

LESSON 3

Development After Birth

Great physical and mental changes occur between birth and the adolescent years. In fact, the only time of greater change is during prenatal development.

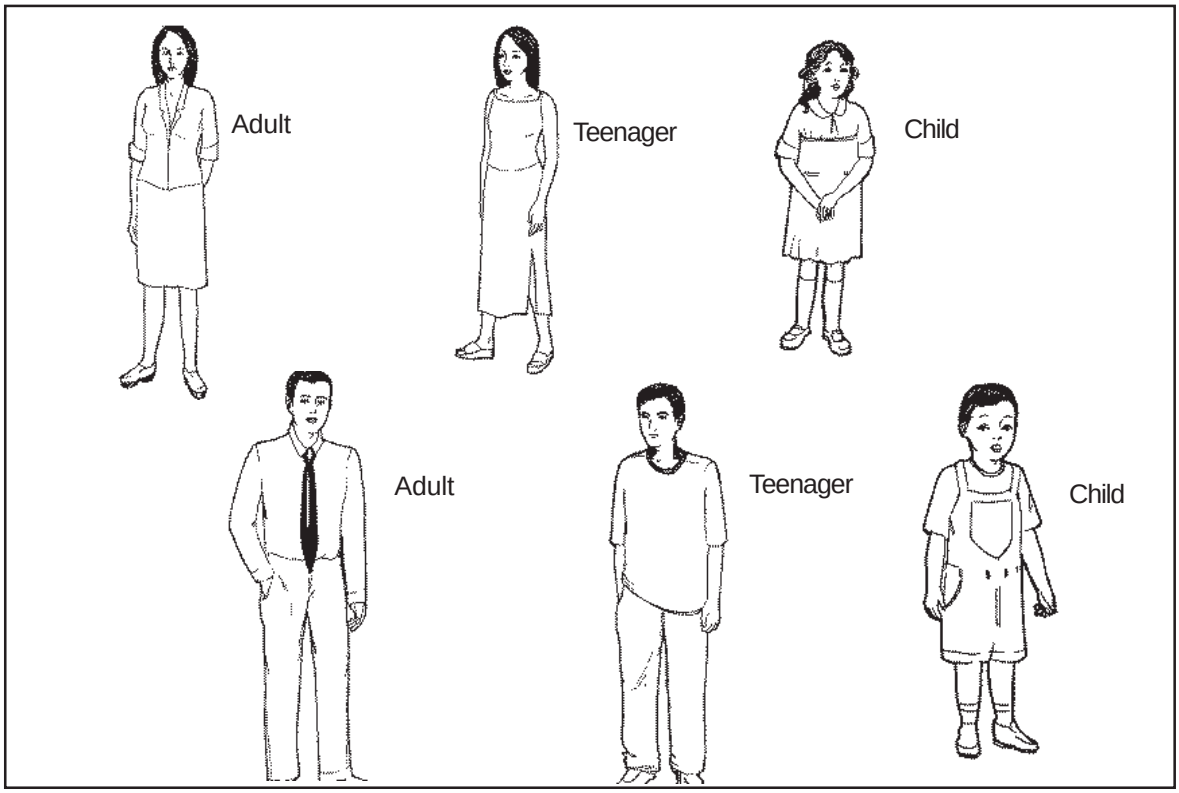
After studying this lesson, you should be able to:

- compare the stages of infancy and childhood and
- relate adolescence to the preparation for adulthood.

Let's Study and Analyze

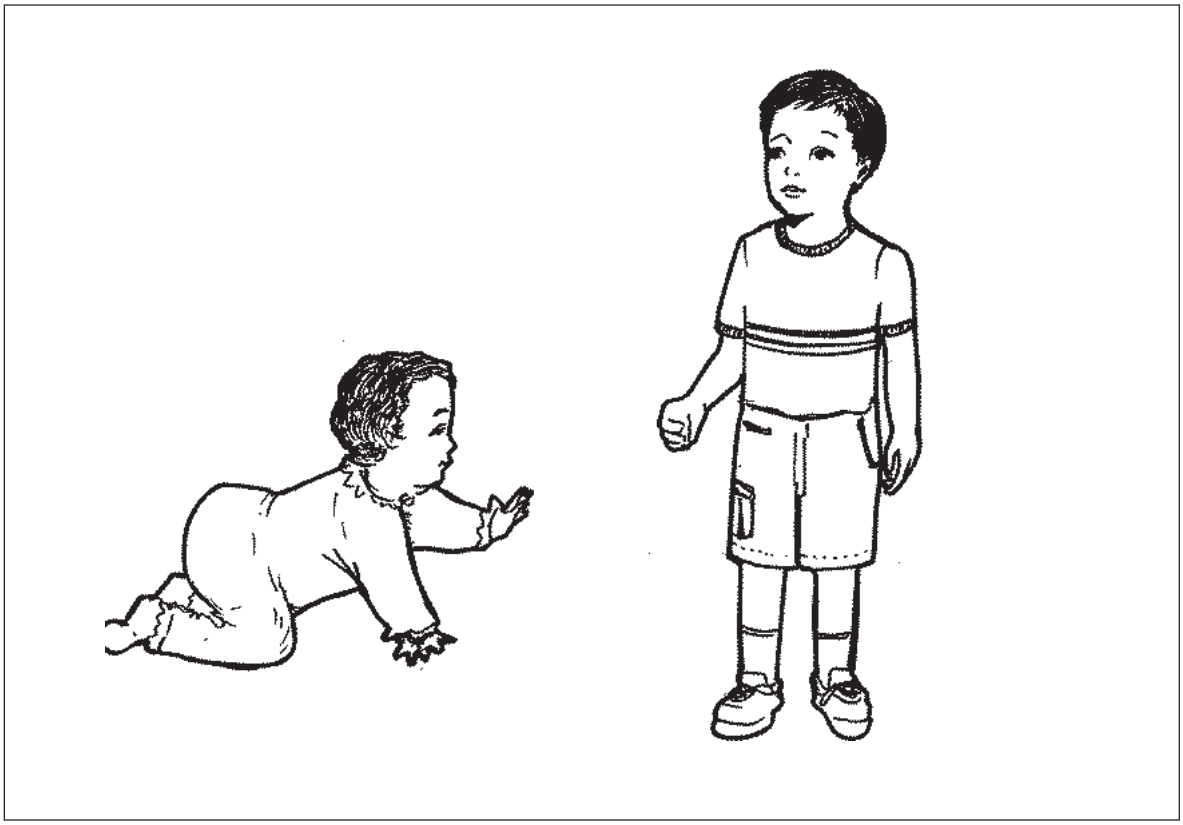
Look at the pictures below. What do you notice about the pictures on the upper and the lower side?

Notice that the pictures on the upper side show the stages in the life of a female while those on the lower side present that of a male.



Let's Learn

From Infancy to Adolescence

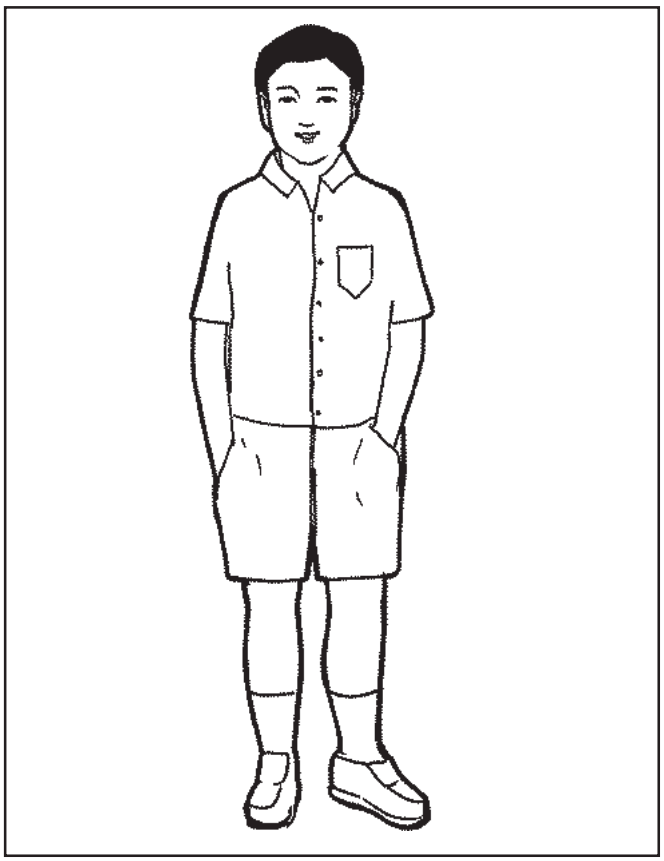


Newborn babies generally sleep and cry a lot.They depend on adults to feed, and change dress them. But from birth to about three years they are also growing and developing rapidly. In its first year, an infant may triple its weight and grow 12 centimeters more. Other things are happening too. Infants respond to sights and sounds as they learn about their new world. They reach and stretch as they try out their muscles. They learn to turn themselves over, sit up and crawl.

By 18 months, most children walk. After two to three years, physical growth slows. In three years, most can speak in short sentences. It is at this stage that children become more skillful in their use of language. Their vocabulary increases and their sentences become longer and more complicated. Children gain better control over their muscles. They learn to do more things such as feeding and dressing themselves without the help of others.

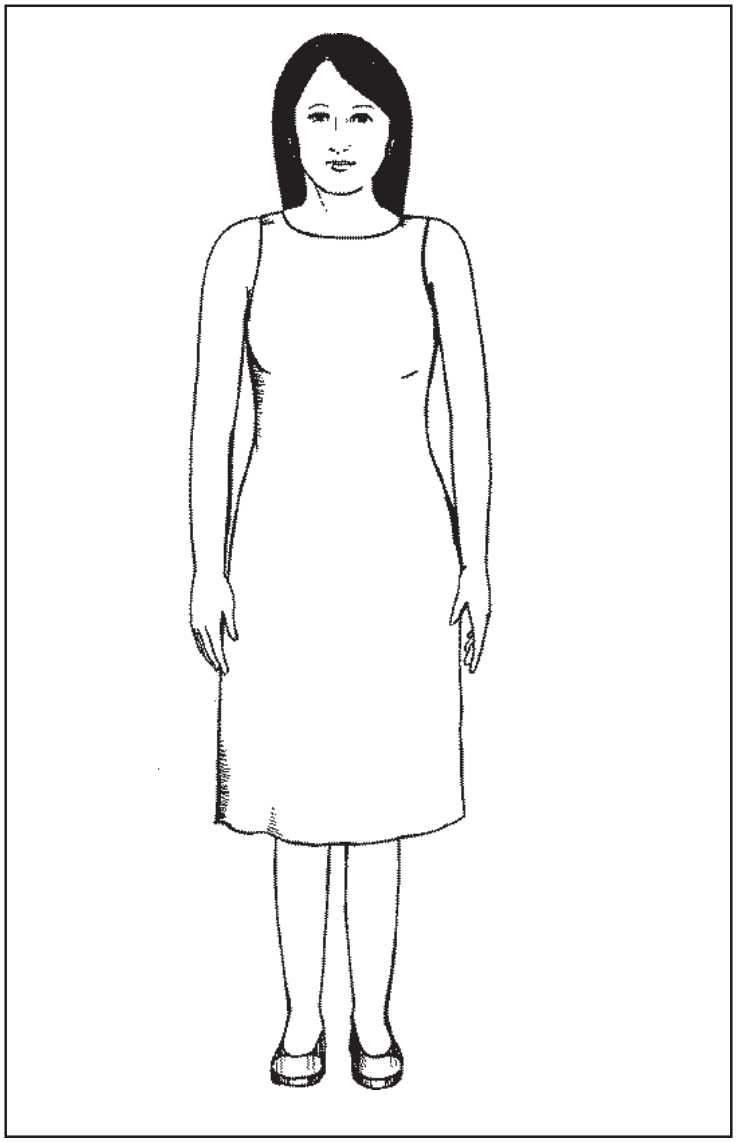
Changes in Later Childhood

From age 5 to the end of childhood, physical growth remains slow. Each year children grow only about 5 cm taller and become only 2 to 3 kg heavier. During this period there is rapid mental growth as they learn to read and do arithmetic. They gain control over the small muscles of their hands as they learn to write and draw. They also develop balance and coordination. Children also learn to ride a bicycle and handle it safely in traffic. Childhood is also a time of learning how to get along with other people. Children learn to make friends and even to work together with others.



The Period of Adolescence

Beginning at ages 11 to 14, the body once again enters a period of dramatic physical change. This period is called **adolescence.** It begins at **puberty** which is the time when your body begins to produce sex hormones. These hormones cause the reproductive organs to grow. Females begin to menstruate and males start to produce semen. Both sexes undergo about two years of rapid growth called the **growth spurt.** As adolescents grow fast—8 to 10 cm per year—they may have trouble with coordination. Running or throwing can be difficult with their gungly, new body. During the growth spurt, many adolescents need extra sleep.

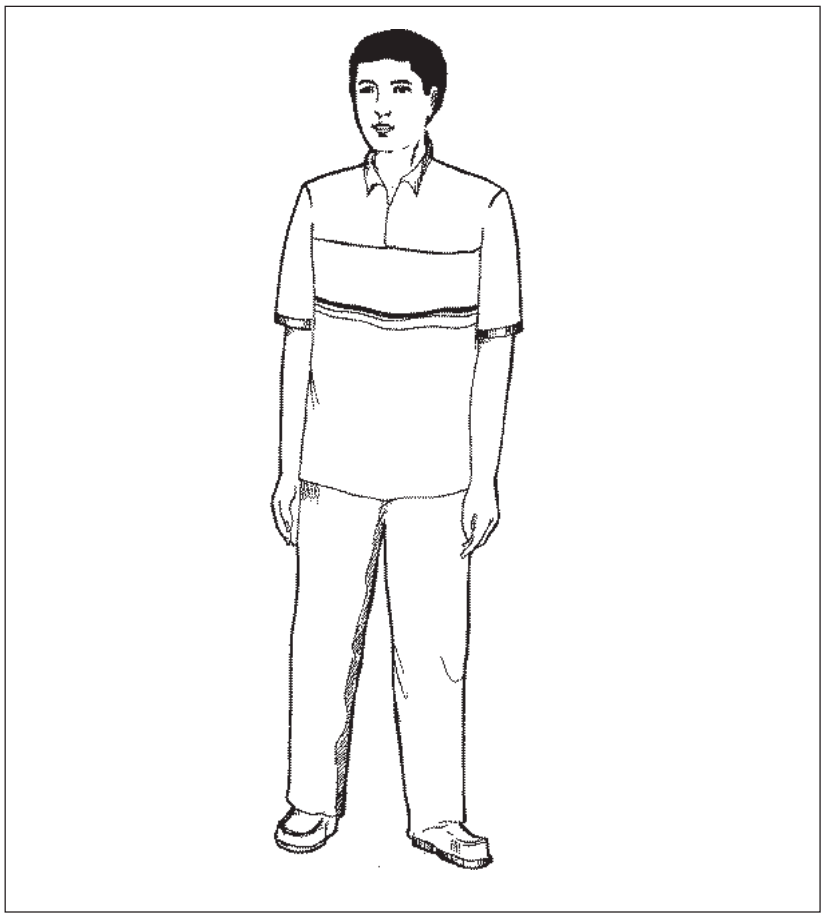


Sex hormones cause other changes too. These are changes that make adult men and women look different from one another. The differences are called **secondary sexual characteristics**. In females, the breasts and body hair begin to grow. The pelvis also grows larger and wider. This allows room for a baby to leave the uterus during birth. The females also put on extra body fat during puberty. The body fat gives females a more rounded shape.

Did You Know That . . .

The function of the extra body fat in females is not exactly known. But if the amount of fats gets too low, the menstrual cycle may become irregular or, if there is too much fat lost, the menstrual cycle may even stop.

Secondary sexual characteristics also appear in males. The shoulders grow broader. The larynx grows, the voice deepens and body hair begins to grow. Male sex hormones also affect muscles. They become larger and stronger.



Let's Try This

Find out how tall you were when you were two years old. Multiply this by two. The answer should be approximately equal to your adult height. Men will be slightly taller, women slightly shorter.

Let's Think About This

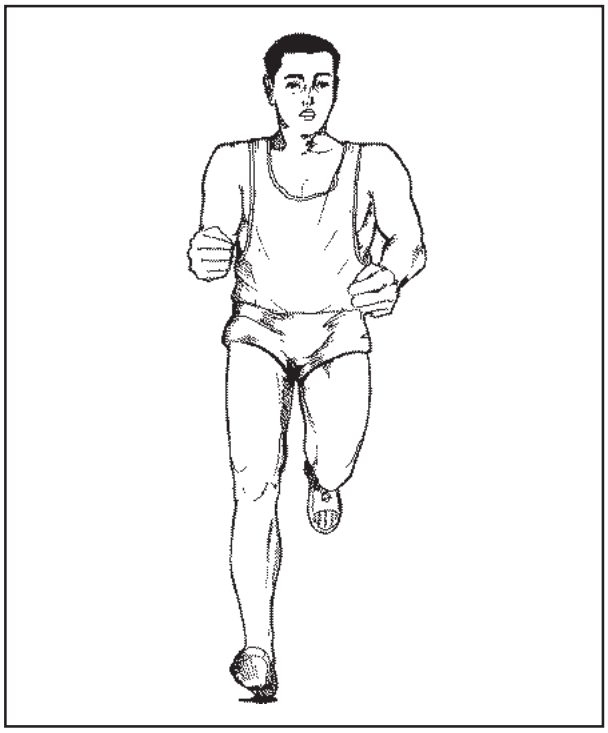
Some adolescents look forward to being adults. For others, the idea is frightening. Being an adult means many things. What does it mean to you?

Let's Learn

From Adulthood to Old Age

By the ages of 18 to 20, our bodies reach their full adult sizes. Physical growth stops. From the ages 18 to 30, we are at our physical peak. Muscles are strongest and coordination is at its best. Most professional athletes are in this age range.

After 30, muscular strength and reaction speed slowly decrease. But many professional athletes play well past their 30s because of all their knowledge about their game. Most people, however, are not athletes and playing sports for fun or exercise can continue for as long as a person lives.



For any people in our society, adulthood is a time of getting an education, a job and having a family. As adults do these things, they learn. They gain practical experience in living and in solving problems.

During middle age, usually between the ages of 40 to 50, women stop menstruating. After menopause, women can no longer have babies. According to scientists, men do not go through any physical change such as menopause. They continue to produce sperm cells their whole lives, however the number of sperm cells they produce decreases.

Aging is the result of cells being lost or failing to function normally. The aging process begins before birth. During prenatal development, some cells and tissues are formed that are not almost immediately destroyed. As humans grow older, more physical changes occur. Wrinkles appear. Eyesight grows dimmer. Hearing fails. Joints stiffen. People move more slowly and are physically weaker than before. Some people become forgetful and may be unable to care for themselves.

Many people live healthy, active lives well into their 90s. Others look and act old in their teens. A healthy diet, regular exercise and being interested in life all seem to slow the aging process. Having parents that lived long, active lives help too.

Find out more about what happens to the human body as it ages. Talk to some old people. Find out how they feel about aging. Write your findings in the space provided below.

_____

_____

_____

_____

_____

Consult your Instructional Manager or Facilitator if you are not sure of your answers.

Let's Think About This

Take a look in a mirror and try to picture yourself at 65 years of age. Most young individuals probably don't give too much thought to aging. In fact, you are probably eager to get older. You may view people older than yourself as having freedom, money and many privileges. However, if you think about some elderly people that you know, you may be reminded of some disadvantages of growing older. Diseases, memory loss, loss of hearing and sight and less energy are usually associated with aging. By choosing healthful habits, some people will have much healthier lives than others.

Let's Remember

- **Adolescence** refers to the period beginning at age 11 to 14 which involves dramatic physical changes.
- **Puberty** is the time when your body begins to produce sex hormones.
- **Growth spurt** refers to the period of rapid growth in adolescents.
- **Secondary sexual characteristics** refer to the changes that make adult men and women look different from one another.

Well, this is the end of the module! Congratulations for finishing it. Did you like it? Did you learn something useful from it? A summary of its main points is given below to help you remember them better.

Let's Sum Up

- Reproduction is important because without it people as well as every living organism would vanish from the earth.
- **Fertilization** is the process wherein an egg cell and sperm cell unite.
- **Sperm cells** are the male sex cells while **egg cells** are the female sex cells.
- Hormones help regulate the production and release of sex cells.
- The **menstrual cycle** involves the growth and release of a mature egg.
- **Menopause** is the period in a woman's life when menstruation stops and pregnancy is no longer possible.
- At the end of the first three months of pregnancy the fetus's body systems are present. But most of them do not function yet. The fetus is about 9 cm long and can weigh about 15 g.
- By the end of six months the fetus will be about 30 cm long and can weigh about 700 g. If the fetus is born at this time, it can survive, but only with a great deal of medical help.
- At the end of nine months the fetus is about 45 cm long and it can weigh about 3,000 g.
- **Adolescence** refers to the period beginning at age 11 to 14 which involves dramatic physical changes.

- **Puberty** is the time when your body begins to produce sex hormones.
- **Growth spurt** refers to the period of rapid growth.
- **Secondary sexual characteristics** refer to the changes that make adult men and women look different from one another.

What Have You Learned?

Answer the following questions briefly.

1. What are sex cells of males and females? Where are they produced?

_____

_____

_____

2. Enumerate the main parts of the male reproductive system?

_____

_____

_____

3. List the major parts of the female reproductive system.

_____

_____

_____

4. What causes menstruation?

_____

_____

_____

5. Define the following terms.

   a. zygote

   _____

   _____

   _____

   b. embryo

   _____

   _____

   _____

   c. fetus

   _____

   _____

   _____

6. What happens during the second three-month period of pregnancy?

   _____

   _____

   _____

7. What changes take place during the last three months of pregnancy?

   _____

   _____

   _____

8. What is the birth process?

   _____

   _____

   _____

9. What changes take place during early childhood?

   _____

   _____

   _____

10. What happens during later childhood?

_____

_____

_____

11. What is puberty?

_____

_____

_____

12. What physical and mental changes occur during adulthood?

_____

_____

_____

13. How do people stay healthy in old age?

_____

_____

_____

Compare your answers with those in the *Answer Key* on pages 37–38. Did you get a perfect score? If you did, that's very good. You learned a lot from this module and you are now ready to study another one. If you did not, review the parts you made mistakes in first before proceeding to another module.

Answer Key

A. Let's See What You Already Know *(pages 2–3)*

1. **(d)** After three months in the womb the fetus's body systems are already present but it still cannot live on its own.
2. **(d)** To lead a healthy, active life in old age, all three should be applied.
3. **(d)** All three answers occur during puberty.
4. **(d)** A pregnant woman does not experience menstruation until after the duration of her pregnancy.
5. **(a)** Female sex cells are produced in the ovaries while male sex cells are produced in the testes.
6. **(b)** Fertilization is the first step in the process of reproduction.
7. **(a)** The union of an egg cell and a sperm cell is called fertilization.
8. **(a)** The ability to reproduce only begins at puberty when a person begins to produce sex hormones.
9. **(c)** Th embryo develops in the uterus.
10. **(d)** This is the only common sexual change that occurs in both males and females.

B. Lesson 1

Let's Review (page 8)

1. The male sex cells are produced in the testes.
2. The major parts of the male reproductive system are:
   a. testes — the organs that produce the sex cells;
   b. ducts — the organs that carry the sex cells; and
   c. hormones — chemicals that serve as a control system.

Let's Review (page 10)

1. Egg cells are produced in the ovaries.
2. The major parts of the female reproductive system are:
   a. ovaries — the organs that produce the sex cells;
   b. ducts — the organs that carry the egg cells; and
   c. hormones — chemicals that serve as a control system.

Let's Review (pages 12–13)

a. 2

b. 1

c. 4

d. 3

e. 5

Let's See What You Have Learned (page 14)

1. a
2. c
3. e
4. g
5. i
6. j
7. h
8. f
9. d
10. b

C. Lesson 2

Let's Try This (pages 20–21)

a. 1

b. 3

c. 5

d. 7

e. 9

f. 2

g. 4

h. 6

i. 8

Let's See What You Have Learned (page 22)

1. a. The head and the brain of the embryo develop rapidly, but the body is small.

   b. Eyes and ears begin to form.

   c. Bumps develop where the arms and legs will be.

   d. The heart forms and begins to beat.

   e. By the end of three months all the body systems are present. But most of them do not function yet. The fetus is about 9 cm long and can weigh about 15 g.

2. By the end of six months the fetus will be about 30 cm long and can weigh about 700 g.

3. At the end of the nine months the fetus is about 45 cm long and it can weigh about 3,000 g.

D. What Have You Learned? *(pages 32–34)*

1. The male sex cells called sperm cells are produced in the testes while the female sex cells called egg cells are produced in the ovaries.

2. The main parts of the male reproductive system are the testes, the ducts and the hormones.

3. The main parts of the female reproductive system are the ovaries, the ducts and the hormones.

4. Menstruation is caused when the mature egg is not fertilized, the lining of the uterus breaks down. Then these flow out of the vagina.

5. a. zygote — a fertilized egg

   b. embryo — a developing organism

   c. fetus — an already humanlike organism inside a woman's womb

6. During the second three months, the growth of the body catches up with the head. Fetal heartbeats can be heard and the developing skeleton shows up on X rays. Most pregnant women begin to feel the fetus kick. The fetus can even have hiccups. By the end of six months, the fetus will be about 30 cm long and can weigh about 700 g. If the fetus is born at this time, it can survive, but only with a great deal of medical help.

7. During this period the fetus puts on a great deal of weight. It gets too large to move freely within its mother's body. At the end of nine months, the fetus is about 45 cm long and can weigh about 3,000 g.

8. The birth process is the entire process which leads to the development of a living organism — from fertilization until the actual giving of birth.

9. Newborn babies are helpless. But from birth to about three years they will grow and develop rapidly. After 18 months, most children already walk. By three years, most can speak in short sentences. At two to three years, physical growth slows. The children become more skillful in their use of language. They also gain better control of their muscles. They learn to do more things for themselves.

10. From age five to the end of childhood, physical growth remains slow. During this period there is rapid mental growth. The children gain control over their small muscles. They also learn how to get along with other people.

11. Puberty refers to the time when your body begins to produce sex hormones.

12. By the ages of 18 to 20, our bodies reach their full adult sizes. From the ages of 18 to 30, we are at our physical peak. After 30, muscular strength and reaction speed slowly decrease. For many people in our society, adulthood is a time of getting an education, a job and having a family. They gain practical experience in living and in solving problems. During middle age, usually between the ages of 40 to 50, women stop menstruating. After menopause, women can no longer have babies. According to scientists, men do not go through any physical change such as menopause. They continue to produce sperm cells their whole lives, however the number of sperm cells they produce decreases.

13. People can stay healthy in old age through proper diet, regular exercise and a healthy attitude on life.

Glossary

Adolescence The period beginning at age 11 to 14 where the body once again enters a period of dramatic physical change.

Egg cell The female sex cells produced in the ovaries.

Embryo A developing organism.

Fertilization The process wherein an egg cell and a sperm cell unite.

Growth spurt The period of rapid growth.

Menopause When women stop menstruating usually between the ages of 40 to 50.

Menstrual cycle The process which involves the growth and release of a mature egg cell as part of the female reproductive cycle.

Menstruation The period of menstrual flow.

Oviduct Where an egg cell travels to the uterus.

Ovulation The process of releasing a mature egg cell from an ovary.

Penis Where the sperm cells pass from the testes and outside the male's body.

Placenta Forms where the clump of cells grows into the uterus.

Prenatal development The processes that change a cell mass into a human baby.

Puberty The time when your body begins to produce sex hormones.

Scrotum The sac outside the male's abdomen that contains the sperm cells.

Secondary sexual characteristics The changes that make adult men and women look different from one another.

Semen The sperm cells, fluid and chemicals that leave the male body.

Sperm cells The male sex cells produced in the testes.

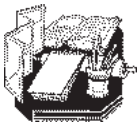
Testes The organs that produce the male sex cells.

Umbilical cord The structure that connects the embryo with the placenta of the mother-to-be.

Uterus A small, muscular, pear-shaped organ that lies between the ovaries.

Vagina The passageway at the bottom of the uterus to the outside of a woman's body.

Zygote A fertilized egg cell.



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