

READING WARM-UP

Objectives

- Identify the structures and functions of the male and female reproductive systems.
- Describe two reproductive system problems.

Terms to Learn

| | |
|--------|--------|
| testes | uterus |
| penis | vagina |
| ovary | |

READING STRATEGY

Reading Organizer As you read this section, create an outline of the section. Use the headings from the section in your outline.

testes the primary male reproductive organs, which produce sperm and testosterone (singular, *testis*)

penis the male organ that transfers sperm to a female and that carries urine out of the body

Human Reproduction

About nine months after a human sperm and egg combine, a mother gives birth to her baby. But how do humans make eggs and sperm?

The Male Reproductive System

The male reproductive system, shown in **Figure 1**, produces sperm and delivers it to the female reproductive system. The **testes** (singular, *testis*) are a pair of organs that make sperm and testosterone (tes TAHS tuhr OHN). Testosterone is the main male sex hormone. It helps regulate the production of sperm and the development of male characteristics.

As sperm leave a testis, they are stored in a tube called an *epididymis* (EP uh DID i mis). Sperm mature in the epididymis. Another tube, called a *vas deferens* (vas DEF uh RENZ), passes from the epididymis into the body and through the *prostate gland*. The prostate gland surrounds the neck of the bladder. As sperm move through the vas deferens, they mix with fluids from several glands, including the prostate gland. This mixture of sperm and fluids is called *semen*.

To leave the body, semen passes through the vas deferens into the *urethra* (yoo REE thruh). The urethra is the tube that runs through the penis. The **penis** is the external organ that transfers semen into the female's body.

✓ Reading Check Describe the path that sperm take from the testes to the penis. (See the Appendix for answers to Reading Checks.)

Figure 1 The Male Reproductive System

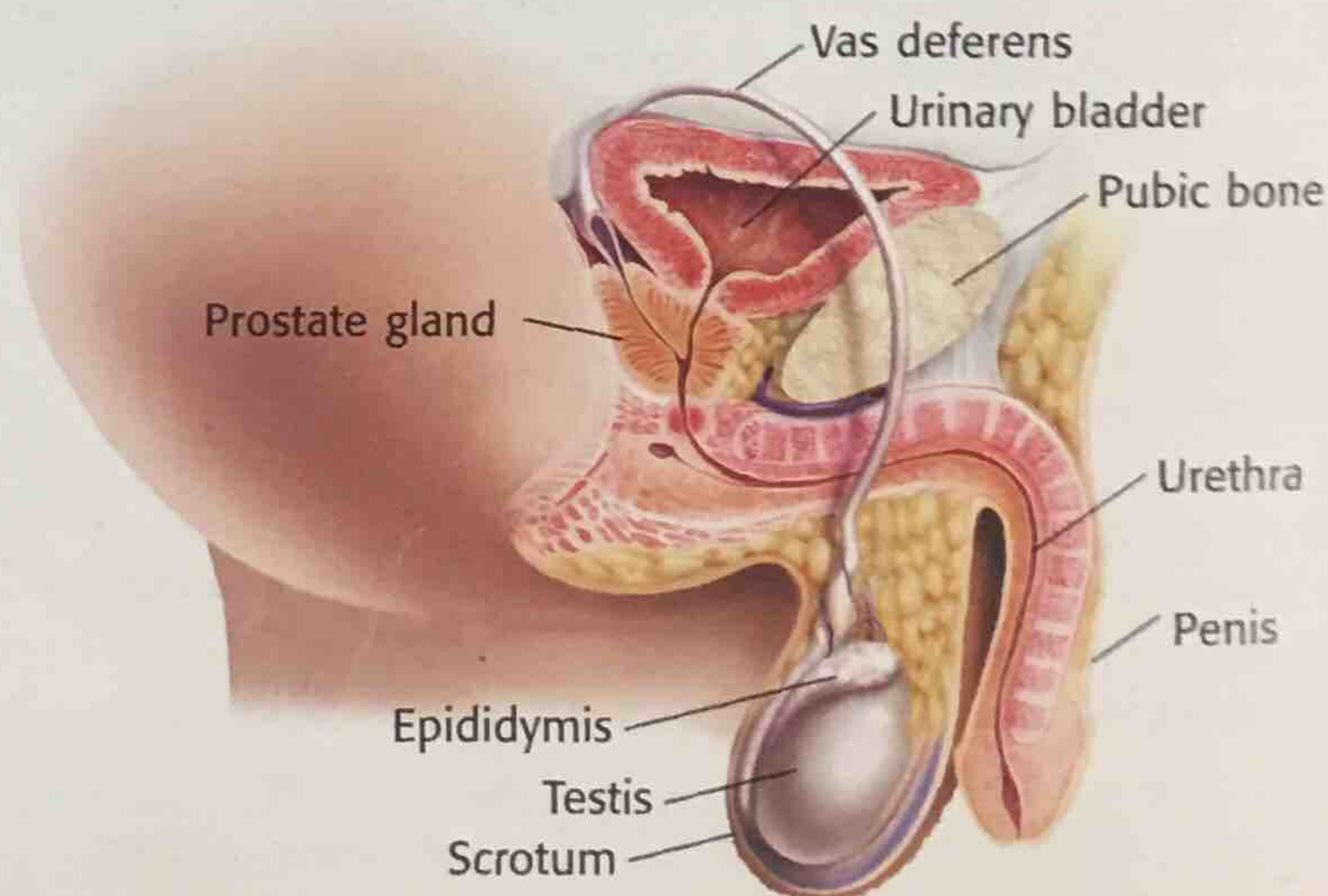
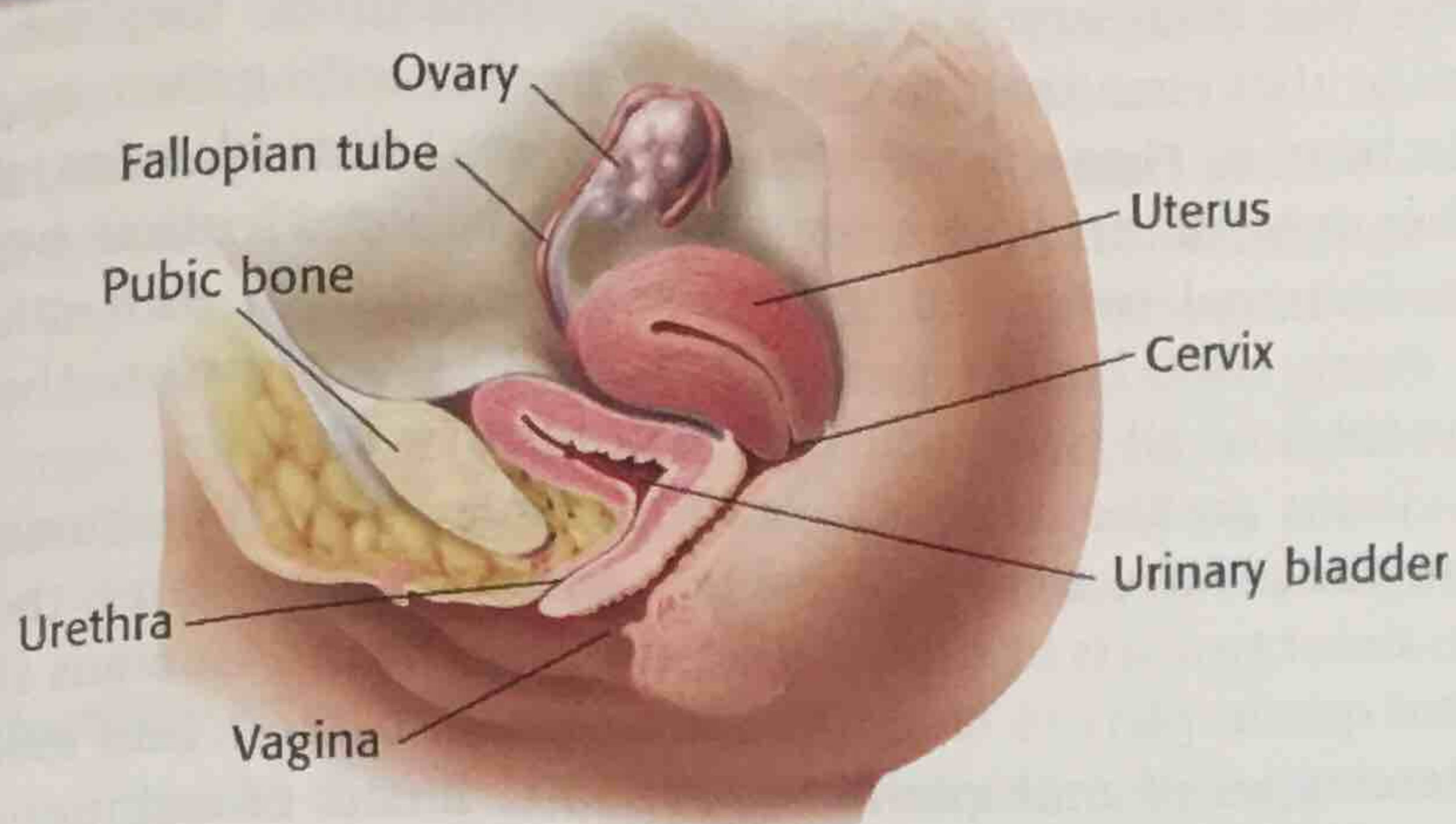


Figure 2 The Female Reproductive System



The Female Reproductive System

The female reproductive system, shown in **Figure 2**, produces eggs, nurtures fertilized eggs (zygotes), and gives birth. The two **ovaries** are the organs that make eggs. Ovaries also release estrogen (ES truh juhn) and progesterone (proh JES tuhr OHN), the main female sex hormones. These hormones regulate the release of eggs and development of female characteristics.

The Egg's Journey

During *ovulation* (AHV yoo LAY shuhn), an egg is released from an ovary and passes into a *fallopian* (fuh LOH pee uhn) *tube*. A fallopian tube leads from each ovary to the uterus. The egg passes through the fallopian tube into the uterus. Fertilization usually happens in the fallopian tube. If the egg is fertilized, the resulting zygote enters the uterus. The zygote may become embedded in the thickened lining of the uterus. The **uterus** is the organ in which a zygote develops into a baby.

When a baby is born, he or she passes from the uterus through the vagina and emerges outside the body. The **vagina** is the canal between the outside of the body and the uterus.

Menstrual Cycle

From puberty through her late 40s or early 50s, a woman's reproductive system goes through monthly changes. These changes prepare the body for pregnancy and are called the *menstrual cycle* (MEN struhl SIE kuhl). The first day of *menstruation* (MEN STRAY shuhn), the monthly discharge of blood and tissue from the uterus, is counted as the first day of the cycle. Menstruation lasts about 5 days. When menstruation ends, the lining of the uterus thickens. Ovulation occurs on about the 14th day of the cycle. If the egg is not fertilized within a few days, menstruation begins and flushes the egg away. The cycle—which usually takes about 28 days—starts again.

ovary in the female reproductive system of animals, an organ that produces eggs

uterus in female mammals, the hollow, muscular organ in which a fertilized egg is embedded and in which the embryo and fetus develop

vagina the female reproductive organ that connects the outside of the body to the uterus

MATH PRACTICE

Counting Eggs

1. The average woman ovulates each month from about age 12 to about age 50. How many mature eggs could she produce from age 18 to age 50?
2. A female's ovaries typically contain 2 million immature eggs. If she ovulates regularly from age 12 to age 50, what percentage of her eggs will mature?



Figure 3 Identical twins have genes that are exactly the same. Many identical twins who are raised apart have similar personalities and interests.

SCHOOL to HOME

Twins and More

With a parent, discuss some challenges that are created by the birth of twins, triplets, quadruplets, or other multiples. Include financial, mental, emotional, and physical challenges.

Create a poster that shows these challenges and ways to meet them.

If twins or other multiples are in your family, discuss how the individuals differ and how they are alike.

ACTIVITY

Multiple Births

Have you ever seen identical twins? Sometimes, they are so similar that even their parents have trouble telling them apart. The boys in **Figure 3** are identical twins. Fraternal twins, the other type of twins, are more common than identical twins are. Fraternal twins can look very different from each other. In every 1,000 births, there are about 30 sets of twins. About one-third of all twin births are identical twins.

Twins are the most common multiple births. But humans sometimes have triplets (3 babies). In the United States, there are about two sets of triplets in every 1,000 births. Humans also have quadruplets (4 babies), quintuplets (5 babies), and more. These types of multiple births are rare. Births of quintuplets or more happen only once in about 53,000 births.

Reading Check What is the frequency of twin births?

Reproductive System Problems

In most cases, the reproductive system functions flawlessly. But like any body system, the reproductive system sometimes has problems. These problems include disease and infertility.

STDs

Chlamydia, herpes, and hepatitis B are common sexually transmitted diseases. A *sexually transmitted disease*, or STD, is a disease that can pass from a person who is infected with the STD to an uninfected person during sexual contact. STDs are also called *sexually transmitted infections*, or STIs. These diseases affect many people each year, as shown in **Table 1**.

An STD you may have heard of is *acquired immune deficiency syndrome* (AIDS). AIDS is caused by *human immunodeficiency virus* (HIV). But you may not have heard of the STD *hepatitis B*, a liver disease also caused by a virus. This virus is spread in several ways, including sexual contact. In the United States, about 140,000 new cases of hepatitis B happen each year.

Table 1 The Spread of STDs in the United States

| STD | Approximate number of new cases each year |
|------------------------------------|---|
| Chlamydia | 3 to 10 million |
| Genital HPV (human papillomavirus) | 5.5 million |
| Genital herpes | 1 million |
| Gonorrhea | 650,000 |
| Syphilis | 70,000 |
| HIV/AIDS | 40,000 to 50,000 |

Cancer

Sometimes, cancer happens in reproductive organs. *Cancer* is a disease in which cells grow at an uncontrolled rate. Cancer cells start out as normal cells. Then, something triggers uncontrolled cell growth. Different kinds of cancer have different triggers.

In men, the two most common reproductive system cancers are cancer of the testes and cancer of the prostate gland. In women, the two most common reproductive system cancers are breast cancer and cancer of the cervix. The *cervix* is the lower part, or neck, of the uterus. The cervix opens to the vagina.

Infertility

In the United States, about 15% of married couples have difficulty producing offspring. Many of these couples are *infertile*, or unable to have children. Men may be infertile if they do not produce enough healthy sperm. Women may be infertile if they do not ovulate normally.

Sexually transmitted diseases, such as gonorrhea and chlamydia, can lead to infertility in women. STD-related infertility occurs in men, but not as commonly as it does in women.

CONNECTION TO Social Studies

Understanding STDs Select one of the STDs in **Table 1**. Make a poster or brochure that identifies the cause of the disease, describes its symptoms, explains how it affects the body, and tells how it can be treated. Include a bar graph that shows the number of cases in different age groups.

ACTIVITY

SECTION Review

Summary

- The male reproductive system produces sperm and delivers it to the female reproductive system.
- The female reproductive system produces eggs, nurtures zygotes, and gives birth.
- Humans usually have one child per birth, but multiple births, such as those of twins or triplets, are possible.
- Human reproduction can be affected by cancer, infertility, and disease.

Using Key Terms

1. Use the following terms in the same sentence: *uterus* and *vagina*.

Understanding Key Ideas

2. Describe two problems of the reproductive system.
3. Identify the structures and functions of the male and female reproductive systems.
4. Identical twins happen once in 250 births. How many pairs of these twins might be at a school with 2,750 students?
 - a. 1
 - b. 11
 - c. 22
 - d. 250

Math Skills

5. In one country, 7 out of 1,000 infants die before their first birthday. Convert this figure to a percentage. Is your answer greater than or less than 1%?

Critical Thinking

6. **Making Inferences** What is the purpose of the menstrual cycle?
7. **Applying Concepts** Twins can happen when a zygote splits in two or when two eggs are fertilized. How can these two ways of twin formation explain how identical twins differ from fraternal twins?
8. **Predicting Consequences** How might cancer of the testes affect a man's ability to make sperm?

SCILINKS

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For a variety of links related to this chapter, go to www.scilinks.org

Topic: **Reproduction System Irregularities or Disorders**

SciLinks code: **HSM1298**