

# **Grade 8: Reproductive and Endocrine Systems**

## **Lesson 2: The Female and Male Reproductive Systems**

*(NOTE to Teachers: Parental permission may be needed for these lessons.)*

### **Objectives:**

#### **Female Reproductive System**

1. Students will define the major functions of the female reproductive system.
2. Students will explore major organs of the female reproductive system and their functions.
3. Students will explain the menstrual cycle.
4. Students will explore the connection between the reproductive system, the endocrine system and puberty.
5. Students will examine problems of the female reproductive system.
6. Students will explain four steps in taking care of the female reproductive system.

#### **Male Reproductive System**

1. Students will define the major functions of the male reproductive system.
2. Students will explore major organs of the male reproductive system and their functions.
3. Students will explore the connection between the reproductive system, the endocrine system and puberty.
4. Students will examine problems of the male reproductive system.
5. Students will explain four steps in taking care of the male reproductive system.

### **Materials:**

- Line drawings of each reproductive system (**See Figure 1 and 2**)

### **Activity Summary:**

In this lesson students will explore the male and female reproductive systems. The organs, functions, and problems of each system will be examined. Students will demonstrate understanding of the connections between the reproductive system, endocrine system and puberty.

### **Background Information for the Teacher:**

#### **Female Reproductive System: Four functions**

- Produces female sex hormones: estrogen and progesterone
- Makes and stores reproductive egg cells, commonly referred to as eggs
- Provides a place for fertilization to occur

- Nourishes the fertilized egg, and the developing fetus until it has matured enough to live outside the mother's womb (the gestation period)

### **Organs**

The major organs are the two ovaries, the uterus, the fallopian tubes and the vagina. The ovaries produce egg cells that move through the fallopian tubes to the uterus. The uterus holds the egg after fertilization until birth. In the birthing process the vagina that connects to the uterus becomes the passageway for the baby to be born. If the egg is not fertilized the lining of the uterus (the endometrium) is sloughed off and passes out of the body through the uterus.

- **Ovaries:** These two almond-shaped glands, which are also a part of the endocrine system, release egg cells, or ova, and create the female sex hormones (estrogen and progesterone) that promote female sexual development. Located on either side of the uterus, the ovaries grow from one-two inches in length during puberty and consist primarily of immature eggs surrounded by hormone-producing cells and connective tissue. Females are born with 40,000 - 300,000 immature egg cells in *each* ovary.
- **Fallopian tubes:** Two fallopian tubes provide passageways for ova from the right and left ovaries to the uterus. After the ova are released from the ovaries they pass through the fallopian tubes to the uterus.
- **Uterus:** A pear-shaped, hollow organ that holds the fertilized egg until birth, the uterus has thick, muscle-tissue walls. The lower narrow portion of the uterus is the cervix, which joins the uterus to the vagina.
- **Vagina:** Passage from the uterus to the outside of the body. The vagina receives the sperm from the male before it moves into the uterus, serves as the birth canal when the baby is ready to leave the womb, and moves menstrual blood (the sloughed lining of the uterus) out of the body in the monthly cycle.

### **Menstrual Cycle**

Ovaries produce one mature egg during each menstrual cycle, usually in the mid-point of the cycle. This release of the mature egg is called ovulation. If the egg is not fertilized the thick uterine lining, the endometrium, leaves the body. Contraction of the muscles of the uterus causes the endometrium to be expelled. These muscle contractions may create an uncomfortable cramping sensation

The menstrual cycle encompasses the entire sequence of events from one menstruation to the next. The average cycle takes 28 days and occurs monthly until menopause.

#### **Cycle Stages:**

- **Days 1 – 13:** New egg is maturing in the ovary.
- **Day 14:** Ovulation occurs; new egg is released.

- **Days 15 – 20:** Egg moves through fallopian tube, where fertilization is most likely to occur.
- **Days 21 – 28:** Egg enters uterus. If it is not fertilized, menstruation begins. Menstrual flow lasts between five - seven days.

These are the average lengths of time for each stage. The actual days can vary widely from one woman to the next, especially during puberty when the cycle is becoming established. Variations in the menstrual cycle are common and normal. The length of both the monthly cycle and the menstrual flow may vary from one period to the next. It may take a year or several years for a young woman's menstrual cycle to even out.

If the ovum becomes fertilized by the sperm, it attaches to the uterine wall when it moves out of the fallopian tubes. In its very early stages, the fertilized egg is referred to as an embryo. After eight weeks it is called a fetus.

### **What's the Endocrine Connection?**

Ovaries are part of the endocrine system, producing the female hormones **estrogen** and **progesterone**. Estrogen is instrumental in the development of female sexual characteristics during puberty. Breast enlargement, hair growth in the genital area and under the arms, the widening of the pelvis, and development of fatty tissue in the thighs and buttocks are all part of the changes that occur during puberty.

### **Problems of the Female Reproductive System**

A variety of disorders can affect the female reproductive system, ranging from mild and uncomfortable to life-threatening:

- **Premenstrual Syndrome (PMS)** – A condition with a variety of physical and emotional symptoms which occur prior to the menstrual period, PMS may include irritability, depression, nervousness, and abdominal cramping.
- **Toxic Shock Syndrome (TSS)** – A bacterial infection that causes high fevers, rash, low blood pressure, and vomiting, Toxic Shock Syndrome was originally linked to the use of tampons, but is now also associated with the use of the contraceptive sponge and diaphragm methods of birth control.
- **Infertility** – The inability of a woman to conceive or to carry a pregnancy to full term. There are many causes for infertility, including blocked fallopian tubes, an inability to produce eggs, and tumors.
- **Cysts** – Benign fibroid cysts can grow on the ovaries or the uterus. Though they often remain quite small, others can grow quite large, feeling heavy and causing discomfort and pressure in the lower abdomen.

- **Sexually transmitted diseases (STDs)** – Spread through sexual contact, the risk of contracting an STD increases with the number of sexual partners and unprotected sexual contact. Cervical cancer and HIV/AIDS are serious and potentially deadly forms of sexually transmitted diseases.
- **Cancer** – Uncontrolled cell growth that destroys healthy cells, cancer can affect the ovaries, uterus, and cervix. Nearly always caused by the human papillomavirus (HVP), cervical cancer is often transmitted through sexual contact. Fortunately, the increased use of cervical screening has reduced the incidence of invasive cervical cancer by 50% or more in recent years.

### **Steps Women Can Take for Preventive Healthcare:**

- Practice good daily hygiene and bathe external genitals.
- Undergo regular yearly gynecological health screenings.
- Conduct monthly breast self-exams.
- Maintain a record of menstrual cycles, tracking the length of the cycle and the menstrual flow. This information should be shared at annual health screening.
- Practicing sexual abstinence to minimize risk.

## **Male Reproductive System**

### **Functions**

- Produces male hormones (testosterone and others)
- Produces male reproductive cells (sperm)
- Stores sperm
- Releases sperm for fertilization of the ovum

### **Organs**

The organs of the male reproductive system include the seminal vesicles, prostate gland, urethra, penis, testes, scrotum, vas deferens, and epididymis.

- **Testes** – Two small egg-shaped glands located behind the penis, they are from 1.5 - 2 inches long. Containing up to a thousand tightly coiled tubes in each testes (uncoiled the tubes would be about three inches in length), the testes produce sperm, testosterone, and other male hormones. Sperm production takes about six weeks, developing through meiosis cell division.
- **Scrotum** – The muscle sac that holds the testes, the scrotum keeps the testes at the correct temperature for sperm production. Depending on the external temperature, the scrotum contracts, pulling the testes to the warmth of the body or drops, to move away from body heat.

- **Epididymis** – A network of tubes behind each testicle, spermatozoa move from the testes to this very thin tube, which is about 20' long when uncoiled, where sperm are stored for up to 20 days while they mature.
- **Seminal vesicles and prostate gland** – These produce the fluid that mixes with the sperm and makes semen, which provides both protection and mobility to the sperm. The fluid is added to the sperm during sexual arousal as they move from the epididymis to the urethra.
- **Vas deferens** – Tubes that connect the epididymis to the urethra.
- **Urethra** – A long thin tube extending from the bladder to the tip of the penis, the urethra transports urine and semen out of the body.
- **Penis** – The external sexual organ releases semen by the contraction of muscles around the prostate gland, seminal vesicles, epididymis, and vas deferens.

### **Fertilization**

Fertilization occurs when the sperm reaches the egg and penetrates it. Between 300 and 500 million sperm can be released in a single ejaculation. Millions of sperm will die through the journey of the vagina, uterus, and fallopian tubes. Each egg and each sperm have half the DNA blueprint (23 chromosomes each) that pair up to create the embryo.

### **Connection to Endocrine System**

During puberty the pituitary gland increases the testes' production of testosterone and other male hormones that cause the development of adult male sexual characteristics. Hair on the face, armpits, chest, and genitals occurs, along with increased bone growth, muscular development, and lengthening of vocal cords that deepen the voice are other characteristics that develop.

### **Problems of the Male Reproductive System**

- **Inguinal hernia** – The protrusion of the intestines into the groin or scrotum, this occurs when the abdominal wall becomes strained and the muscles weaken so that the intestines put pressure on other areas normally protected.
- **Sterility** – Inability to produce enough healthy sperm to successfully fertilize an ovum. Sterility can be caused by many things, including radiation, x-rays, certain chemicals and pesticides.
- **Sexually Transmitted Diseases (STDs)** - Spread during sexual contact, risk of STDs increases with the number of partners and unprotected sexual contact. HIV/AIDS is a very serious and potentially deadly sexually transmitted disease.

- **Cancer** - Uncontrolled cell growth that destroys healthy cells, cancer can affect the testes and the prostate. Testicular cancer is a common cancer in males between 15 and 35, while prostate cancer usually affects men over the age of 55.

**Steps Men Can Take for Preventive Healthcare:**

- Practice good daily hygiene and bathing of the external genitals.
- Conduct regular testicular self-examinations, which can catch any unusual swelling or lumps early and greatly increase chances for successful treatment.
- Undergo regular health screenings.
- Wear protective gear when playing contact sports.
- Practice sexual abstinence to minimize risk.

**Vocabulary:**

**FEMALE REPRODUCTIVE SYSTEM:**

- Reproduction
- Ovaries
- Uterus
- Fallopian tubes
- Vagina
- Endometrium
- Estrogen
- Progesterone
- Ova
- Menstruation
- Fertilization
- Pregnancy
- Infertility

**MALE REPRODUCTIVE SYSTEM**

- Penis
- Testes
- Scrotum
- Urethra
- Epididymis
- Vans deferens
- Seminal vesicles
- Prostate gland
- Testosterone
- Semen
- Sperm
- Ejaculation
- Inguinal hernia
- Sterility

**Engage:**

1. Have **female** students draw a diagram of the male reproductive system, labeling each of the following parts:
  - Penis
  - Testes
  - Scrotum
  - Urethra
  - Epididymis
  - Vans deferens
  - Seminal vesicles
  - Prostate gland
2. Have **male** students draw a diagram of the female reproductive system, labeling each of the following parts:
  - Ovaries
  - Uterus
  - Fallopian tubes
  - Vagina

**Explore:**

1. Write all the vocabulary words listed above on the board.
2. Assign students the task of formulating one question they have regarding any of the terms. To ensure student anonymity, remove students' names from their papers before randomly handing out the questions.
3. Have each student research the question on their paper and create a poster reporting the answer they found. Display the posters, discussing the questions and the answers.

**Explain:**

Ask each person to answer the following questions, and have them record this information on two separate pieces of paper--one for the female reproductive system and one for the male:

1. What are the functions of each system?
2. What are the primary organs of each system?
3. What role does each of these organs have in the production and movement of the egg in the system?
4. The sperm?
5. How does each system prepare for fertilization? Explain the menstrual cycle?

In order to help students learn accurate information about the male and female reproductive systems, start with the first question, writing the correct response on the board or a large paper. Use the anatomical charts and models to review the information and provide a visual representation. Repeat for the remaining questions, two through six.

1. Ask: **“How does the Endocrine System relate to the Reproductive System? What’s the connection?”** (Answer: Review gland production of hormones, hormone influence on development of adult male and female characteristics.)
2. Ask: **“What are some similarities caused by the Endocrine System in females and males?”** (Have students review information about the Endocrine System and subsequent changes in female and male adolescents.)
3. Ask: **“What types of health problems can occur within the FEMALE Reproductive System?”** (Answers: Premenstrual Syndrome [PMS], Toxic Shock Syndrome [TSS], Infertility, Cysts, Sexually transmitted diseases [STDs], and Cancer.)
4. Ask: **“What types of health problems can occur within the MALE Reproductive System?”** (Answers: Inguinal hernia, Sterility, Sexually Transmitted Diseases [STDs], and Cancer.)
5. Ask: **“How do you take care of your Reproductive System?”** (Have students give answers for the male and female systems separately. Ask them to record the similarities and differences.)

#### **Extend:**

Give students the line drawings of the Reproductive Systems. **(See Figure 1 and 2)** After students have filled in the blanks by themselves, put the drawings up on the overhead and go over the information. Have students check their answers and correct their papers. Have students then look at their original drawings and compare them to the new information they have learned.

#### **Evaluate:**

Have each student compare and contrast the similarities between the female and male reproductive systems. The students can create a Venn diagram, a chart, a mind map or another graphic organizer to present their information. Students must record information about the functions, primary organs, the connection between the reproductive and endocrine systems, and reproductive health concerns.



**Optional Enrichment Activity:**

Strategies: Assign questions or topics about specific reproductive health issues to individual students or pairs. Have the students do some basic research using school or local library sources as well as internet sources (See Web Resources at the end of this lesson.) Report back to class with the answers. *(NOTE: The Healthy Habits lesson in this unit is focused on sexually transmitted diseases.)*

**Additional Web Resources:**

- **TeenHealth.org** - <http://www.kidshealth.org/teen/>  
Search: Puberty, Endocrine System, Male Reproductive System, Female Reproductive System
- **American Cancer Society** - <http://www.cancer.org/>  
Search under categories: Sexual Health, and Diseases and Conditions
- **American Social Health Association** - <http://www.iwannaknow.org/>  
Search under categories: Sexual Health, and Diseases and Conditions

**Missouri Standards:**Health and Physical Education Frameworks

- I. Function and Interrelationship of Systems
  - A. Body Systems

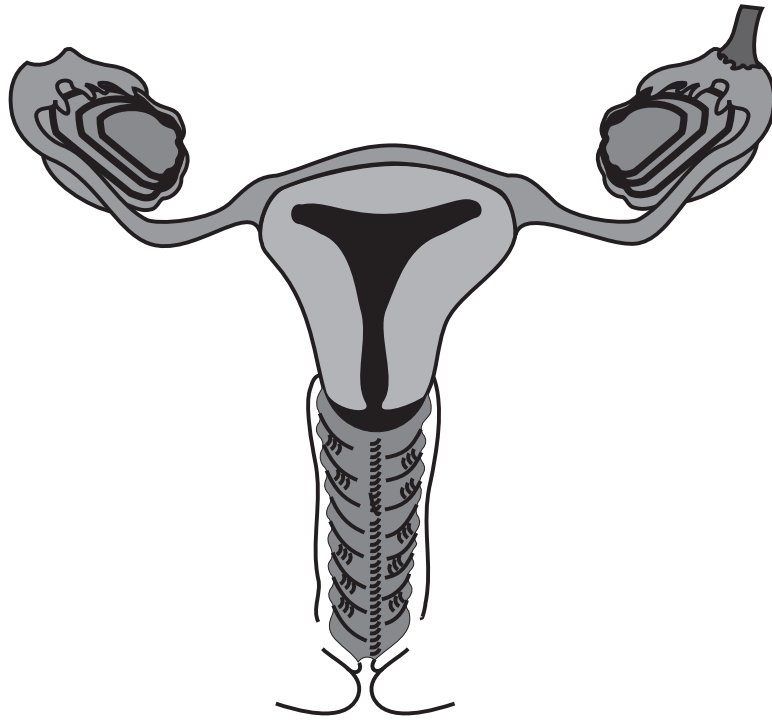
What All Students Should Know:

5. The Reproductive System includes male and female organs that release specific hormones responsible for the development of secondary sex characteristics and for the production and release of reproductive cells, allowing the opportunity for fertilization.

What All Students Should Be Able To Do:

- a. Research the physical, emotional, social and intellectual changes occurring during puberty.

## Female Reproductive System



## Male Reproductive System

