

**A TIME OF  
CHANGES**

**A Booklet for Boys and Girls**

**Fifth Grade**

# A TIME OF CHANGES

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# A TIME OF CHANGES

You'll change in many areas of life.

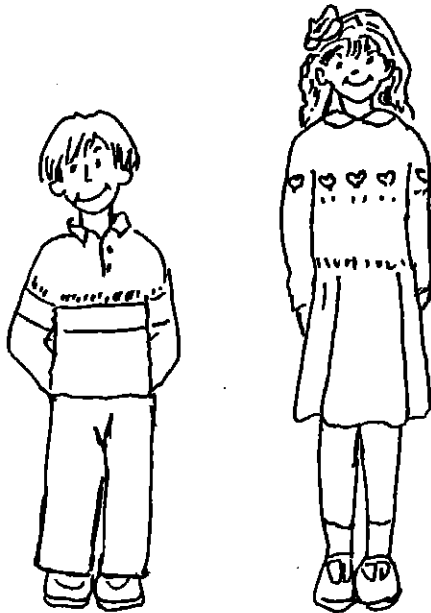
MENTALLY -	You'll think new thoughts and consider new ideas.
EMOTIONALLY -	You'll feel happier and sadder than ever before. You'll care about others in new ways, too.
PHYSICALLY -	You'll begin to look more like an adult.

## CHANGES

Let's talk about changes. Think back to the youngest age you can remember. What are changes that have happened since then? The years between 10 and 14 may be a lot of fun, but physically they may be among the most puzzling years of your life. That's because you are turning from a child into a young adult. Changes are taking place, both in your mind and your body.

We call this change *puberty*. Puberty is the different changes that occur in your body and in your feelings. You may have new feelings that you don't always understand, but it's changes that take place physically that will be the most obvious.

You will experience these changes at very different rates.



Usually:

Girls will grow before boys.

You will find people of your own *gender* developing at different ages and rates than you.

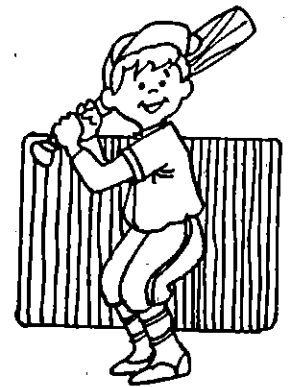
You will develop at the right time and rate for you.

## CHANGES IN BOYS

Puberty is the time of life during which your body starts changing from that of a child to that of an adult.

Puberty begins when glands in the brain (*hypothalamus* and *pituitary*) signal the testicles to start producing a hormone called *testosterone*. This hormone causes some important changes to take place. The production of testosterone and the changes it causes can start as early as age 8 or as late as 15. How early or late you start changing is mostly determined by what is inherited from your parents.

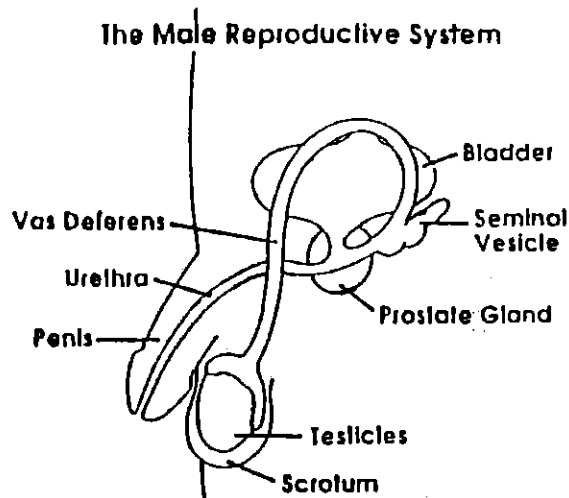
As testosterone levels increase in a boy's body, the physical changes become easier to see. You will grow in height and your shoulders will broaden. Your penis will grow in length and width. Your testicles will also grow and begin producing sperm cells. You will also notice the growth of body hair in your pubic area, chest, legs, arms and underarms. By age 18, most boys will have facial hair. Testosterone levels will also cause your voice to deepen as your vocal chords and larynx enlarge. During puberty, you will also need to pay closer attention to keeping clean due to an increase in perspiration, especially under your arms.



## THE MALE REPRODUCTIVE SYSTEM

Some of the male reproductive organs are outside the body. There are several other parts inside the male's body.

The **penis** is at the front of the body, at the base of the abdomen. It may be either circumcised or uncircumcised. When a boy is circumcised, he has an operation to remove the foreskin - a soft fold of skin from around the tip of the penis. While many boys have been circumcised, it is also common to have a penis with foreskin.



Behind the penis is a pouch of muscular skin called the **scrotum**. Inside the scrotum are the testicles. Their location outside the body helps keep them slightly cooler than the internal body temperature. Sperm cells, which form in the testicles, cannot grow in a place as warm as the inside of the body. In warm weather, the testicles hang lower in order to

keep the sperm cells away from the body's heat. This happens because the muscles in the scrotum relax. In cooler weather, the muscles in the scrotum draw them closer to the body's heat. It is normal for one testicle to hang slightly lower than the other.

The testicles are oval-shaped. When a male reaches puberty, they begin two very special jobs. One of these jobs is to produce hormones. The other job is to make sperm cells. After puberty, sperm cells are always forming in tiny tubes within the testicles.

The many tubes in each testicle come together into one coiled tube. This tube opens into another tube called the **vas deferens**. Each vas deferens is about 24 inches long. Each curves under the bladder and connects with a single tube, the urethra. The urethra extends from the bladder down through the penis, and is used to remove urine from the body.

Most of the time, the penis is limp. Sometimes, however, certain tissues within the penis fill with blood. The penis then becomes firm. This condition is called an **erection**. Involuntary erections are perfectly normal. An involuntary erection is an erection for no apparent reason. They often happen without warning, are rarely noticeable to others, and they will go away. Ejaculation does not occur every time there is an erection.

Before sperm cells can leave the body, the penis must be erect. There is no relationship between the size and shape of the penis when it is soft and when it is erect.

When certain signals come from the nervous system, each vas deferens tightens and its opening narrows. This squeezing action moves sperm toward the urethra. On the way through the vas deferens, the sperm cells mix with certain fluids. These fluids are made by the **seminal vesicles** and the **prostate gland**.

The mixture of sperm cells and fluids is called **semen**. The semen passes through the urethra and forcefully leaves the penis in a process called ejaculation. A wet dream, also called a "nocturnal emission," is nothing to worry about. It's when boys ejaculate in their sleep without knowing about it. They may find wet semen on their pajamas or sheets when they wake up. Wet dreams are perfectly normal for boys. Not having wet dreams is also perfectly normal.

## CHANGES IN GIRLS

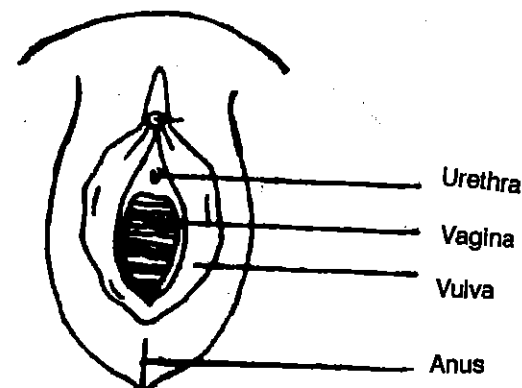
When girls reach puberty, the hypothalamus, which is like the master switch in the brain, sends a message to a gland at the base of the brain called the **pituitary gland**. This starts the production of a hormone which stimulates the secretion of **estrogen** from the ovaries. (This can start as early as age eight or nine or as late as age 15.) Estrogen is a special female hormone that causes some important changes to take place in a girl's body.

Usually the first noticeable change is a growth spurt - which means that girls grow taller faster. Some girls grow as much as four inches in one year! The body changes in other ways as well. For instance, hips and other parts of the body develop a rounder shape as body fat increases. An increase in weight and body fat is an important and normal part of growing up for girls.

Another change is in the breasts. First the tissue just under the nipple rises slightly. This is called a "breast bud." Next, the breast and areola (which is the ring of darker skin around the nipple) starts to grow. The breast

continues to enlarge until it takes on a rounded shape.

All this usually takes about four years. The breast size and rate of development vary from one girl to another.



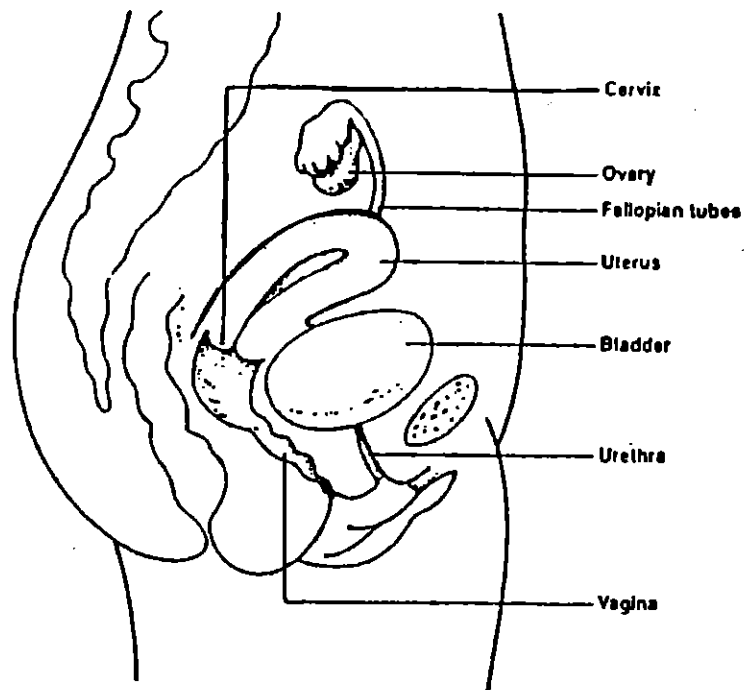
The whole outside part of a girl's genital area is called her **vulva**. This begins to enlarge during puberty. At about the same time, pubic hair starts to grow around the vulva. Later, hair grows under the arms and on the legs.

## THE FEMALE REPRODUCTIVE SYSTEM

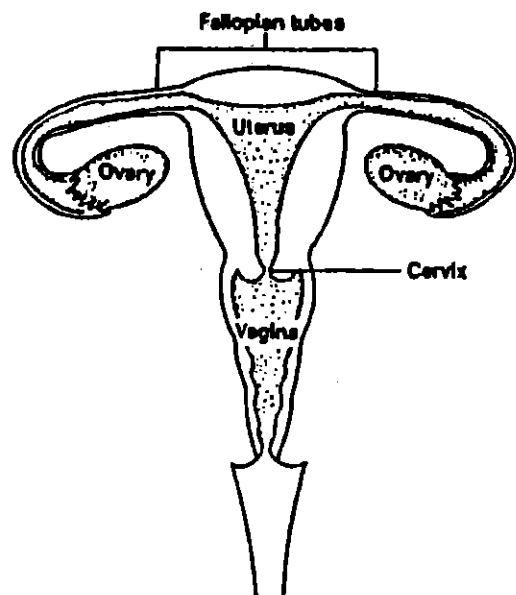
The female reproductive system is made up of some special **organs**. The female reproductive organs make it possible for her to have a baby. They include the vagina, the uterus, two Fallopian tubes and two ovaries.

The **vagina** is a muscular tube about four to five inches long. The entrance to the vagina is between the urethra, where urine comes out, and the anus, through which bowel movements are passed.

This is a side view of the female reproductive system.



This is a front view of the female reproductive system.



The vagina connects the uterus with the outside of the body. The part of the uterus that meets the vagina is called the **cervix**. The **uterus** is about the size and shape of an upside-down pear. It's a hollow organ with a special lining of tissue called the **endometrium**. At each side of the uterus, within the abdomen, are two finger-like passageways called the **Fallopian tubes**. Near the ends of these tubes are two small organs - about the size of a walnut called **ovaries**. The ovaries contain about 250,000 **ova**. Ova are often called eggs, but they are only about the size of a grain of sand, and don't look anything like eggs you are used to seeing. They've been in the ovaries since birth, but it isn't until puberty that they begin to mature.



As your body begins to produce special hormones, changes are taking place in these internal organs. The vagina becomes deeper and girls may start to notice some wetness, called vaginal discharge, on their panties. The color of this discharge is usually clear to whitish and, it's normal in small amounts. Also, the uterus becomes larger and the lining of the uterus becomes thicker. The ovaries enlarge and get ready for ovulation.

## OVULATION

When the body is ready, an ovum (egg) in one of the ovaries will mature and be released each month. Upon release, the egg travels into the Fallopian tube on its way to the uterus.

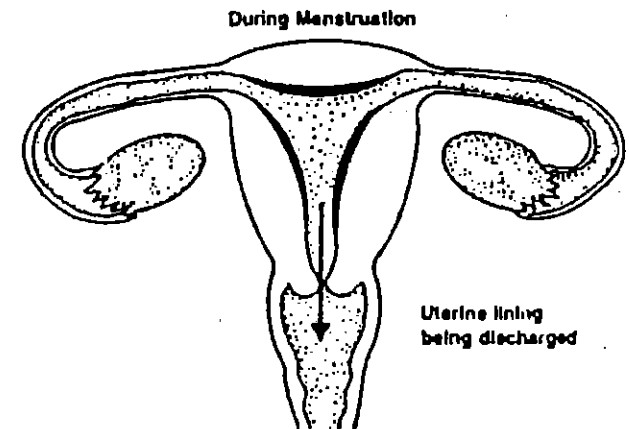
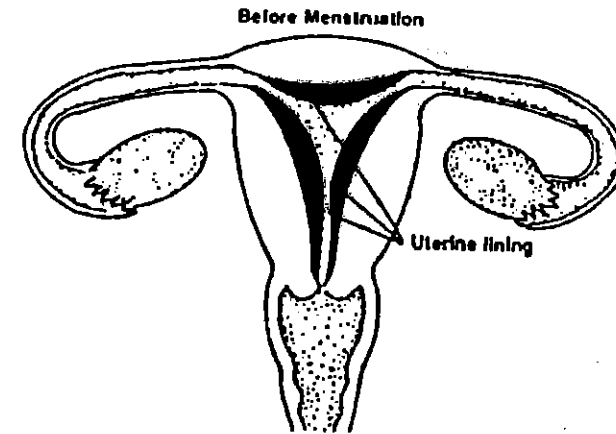
When the egg leaves the ovary, the uterus prepares itself for a possible pregnancy in the event that the egg is fertilized. The uterus is lined with a rich supply of blood for the soft, spongy tissue of the endometrium. This will nourish the egg if it is fertilized and help the developing baby to grow during its nine months in the uterus.

Most often, the egg that is released every month will not become fertilized so all of this nourishment won't be needed. If an egg cell is not fertilized, it dissolves soon after reaching the uterus. Then the thickened lining of the uterus breaks apart. Along with a small amount of blood, it leaves the body through the vagina. This discharge is called **menstruation**. Menstruation is a normal and natural part of growing up.

### Having a Period - What's It Like?

A menstrual period usually lasts from three to seven days. Again, this can vary from girl to girl. The flow is typically heavier at the beginning of your period than at the end. Over an entire period, about four ounces of menstrual fluid (which contains endometrial lining and the blood) leaves the body through the vagina. The body contains more than a hundred ounces of blood. There are only about two ounces of blood in menstrual flow and it is quickly replaced.

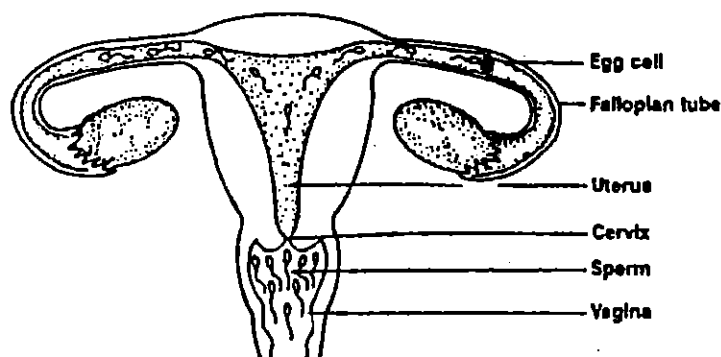
The most important thing to remember is that every girl is different. Some girls have their period every 28 days. For others, the time may be shorter or longer. Almost all girls just starting to menstruate will take a while before establishing a regular pattern. It is a good idea for girls to keep track of their periods on a personal calendar.



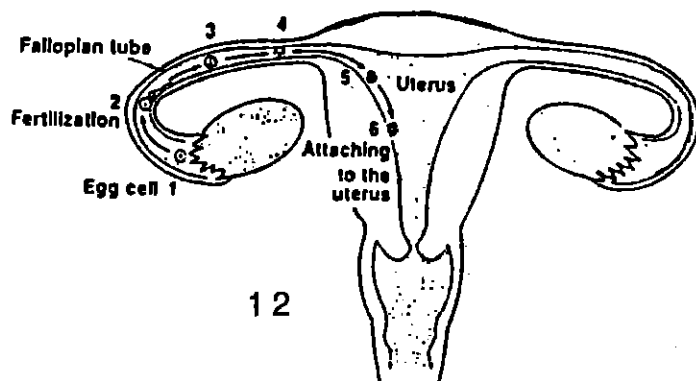
## FERTILIZATION

Of the millions of sperm cells present, only one is needed to fertilize the egg cell. Many of the sperm cells die on their way through the vagina and into the uterus. Those that reach a Fallopian tube will surround an **egg** cell if it is present. If a sperm cell joins with the egg cell, the egg cell will then be fertilized. Sperm cells that fail to enter an egg cell soon die.

The fertilized egg then continues traveling toward the uterus. This trip takes about three days. While traveling, the cell divides again and again forming a tiny ball of cells.



Once in the uterus, the tiny ball of cells attaches to the lining of the uterus. It is cushioned and fed by the thick lining of blood vessels that the uterus has built up to prepare for it.



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## SEXUAL RESPONSIBILITY

Sexual intercourse is the physical union between a man and a woman that occurs when the erect penis is in the vagina. Semen, which contains sperm cells, is ejaculated into the vagina.

Once in the vagina, the sperm cells move through the cervix and into the uterus. After one or more hours, they enter the Fallopian tubes where fertilization may occur.

Sexual intercourse is a serious act and should never be taken lightly. It is the most intimate expression of love and should be reserved for adults only. You are far too young to have sexual intercourse. While your bodies are maturing, you must also mature emotionally and mentally. Because it will be many more years before you are ready to take on the responsibility of a sexual relationship, **abstinence**, choosing not to take part, is the healthiest choice.



Sexual responsibility is a decision affected by family values and religion. It should be discussed with your parents and other trusted adults.

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## BODY CLEANLINESS

Now that you're growing up and going through puberty, you have to start taking care of your body differently. When you were a little kid, you could get away with not taking a bath every day, but not any more. Now it's essential!

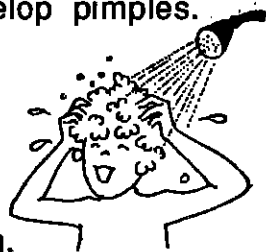
Your glands are more active than ever. The sweat glands under your arms and in your genital area start producing more perspiration during puberty. These areas need special attention when you bathe. Hot weather, exercise or excitement often cause more perspiration.

Perspiration itself has no odor, but when it comes into contact with bacteria on your skin, it creates an unpleasant odor. To wash sweat and bacteria away, you need to take a shower or bath every day and also after any strenuous physical activity. After you bathe, it's a good idea to use a deodorant or an antiperspirant. And, of course put on clean clothes.

Another good reason to bathe every day is that your oil glands - especially on your face, back, shoulders, and chest - are more active now. The oil glands (also called the "sebaceous glands") produce an oily substance called "sebum." If sebum blocks the pores of your skin and combines with bacteria, you can develop pimples.

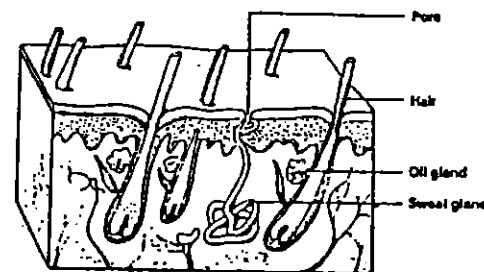
## SKIN PROBLEMS

When pores become clogged with dirt, an infection may result, and pimples may form. Some girls, however, may notice more just before their menstrual period due to hormone changes. For many boys and girls going through puberty, pimples are a fact of life. Sometimes they get



them no matter what they do. People used to think that pimples were caused by eating too much chocolate or greasy food, but that doesn't seem to be the case - although you should avoid eating too much of those kinds of foods for nutritional reasons.

Still, there are some things you can do to keep pimples from becoming a big problem. Keeping clean is the most important, so make sure you wash your face (gently - don't rub it raw!) at least twice a day. Also, try to keep your hands away from your face and don't pick pimples. You might cause an infection or leave a scar.



Having many pimples on the skin is a condition called **acne**. Acne is common in both boys and girls, but it is usually worse in boys.

If acne persists, you can use an anti-acne cream, lotion, or cleansing pad. If none of this works and acne is still a problem, you should talk to your doctor.

The sebaceous glands on your scalp also work overtime during puberty. This can give your hair a greasy, dull look, and you may develop dandruff. Chances are, you'll need to shampoo your hair more often - maybe even every day.

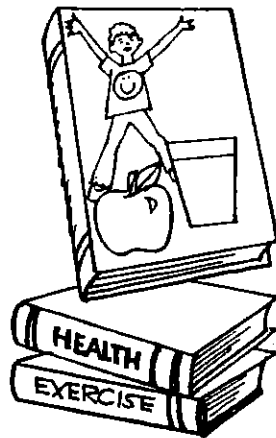
Finally, your body's not really clean unless your mouth is clean, too. To have healthy teeth and gums, and fresh breath, you need to brush

your teeth, gums, and tongue regularly. And remember to floss!

## Nutrition

During puberty, eating a well-balanced diet is more important than going on a diet. In fact, because your body is going through so many changes, eating right is more important than ever before. And "eating right" means choosing a variety of foods from the basic food groups - especially foods that are rich in calcium (like milk, yogurt, and cheese) and iron (like beef, turkey, beans, and eggs).

Some weight gain is normal during puberty. Not only are you growing taller, but the shape of your body is changing, too. It is normal for developing girls and women to have a higher percentage of body fat even though men usually weigh more. So do not worry about your weight gain unless you are substantially overweight. If this is the case, a well-supervised diet may be a good idea. But you and your parents should consult a doctor first.



## EXERCISE

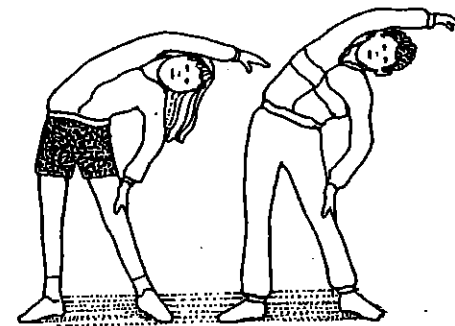
The best way to keep your weight down and stay in terrific shape is to exercise. Exercise also gives you more stamina and flexibility and strengthens your heart, lungs, and bones.

You don't have to make the team to get good exercise. There are lots of physical activities you can do with a friend or all by yourself, including:

- Running
- Swimming
- Jumping rope
- Aerobic dance
- Roller skating
- Fast walking
- Bicycling
- Skiing
- Climbing stairs
- Ice skate
- Team sports



You will experience many changes in your life. Taking care of yourself and knowing what to expect can make growing up feel pretty good.



## GLOSSARY

### **Abstinence**

(AB-sti-nens) - Choosing not to take part in a behavior e.g. sexual activity.

### **Acne**

(AK-nee) - A condition in which there are many pimples on the skin.

### **Adolescence**

(ad-oh-LESS-ens) - The period of physical and psychological development from the beginning of puberty to maturity.

### **Anus**

(AY-nus) - The opening of the rectum through which solid waste is passed out of the body.

### **Cervix**

(SER-vix) - The lower section of the uterus that protrudes into the vagina.

### **Circumcision**

(SIR-come-si-zhun) - An operation to remove the foreskin - a soft fold of skin around the tip of the penis.

### **Egg**

Also called an ovum, it's the female reproductive cell.

### **Ejaculation**

(ee-JACK-you-lay-shun) - The release of sperm containing semen from the penis.

### **Endometrium**

(en-doh-MEE-tree-um) -  
The soft, spongy lining of the uterus.

### **Erection**

(ee-RECK-shun) - The stiffening of the penis when blood fills the tissue inside it.

### **Estrogen**

(ES-troh-jen) - Female hormone produced in the ovaries that is responsible for many of the changes that take place during puberty.

### **Fallopian tubes**

(fal-LOH-pee-un) - Two tubes connecting the ovaries to the uterus through which the egg travels.

### **Fertilization**

(fur-till-ih-ZAY-shun) - The joining of a female egg and a male sperm to form an embryo.

### **Foreskin**

Located at the end of the penis; this flap of skin is often removed surgically at birth (circumcision). Area needs to be cleaned during regular bathing.

### **Gender**

The sex of an individual: male or female

### **Genitals**

(JEN-ih-talz) - The external reproductive organs.

### **Hormones**

(HOR-moans) - Chemical substances - produced by organs called glands - that regulate the growth and activity of body tissues and organs.

**Intercourse**

The physical union between a male and female that occurs when the erect penis is in the vagina.

**Menstrual cycle**

(MEN-stroo-al SIGH-cul) - The process of ovulation and menstruation that occurs approximately once a month beginning at puberty and ending with menopause.

**Menstrual fluid**

(MEN-stroo-al FLOO-id) - The uterine lining consisting of spongy tissue and blood, that flows out of the body through the vagina during your period.

**Menstruation**

(men-stroo-A-shun) - The period during which the uterine lining - the endometrium - passes out of the body through the vagina.

**Nocturnal emission**

(nok-TUR-nal eh-MISH-un) - Also called a wet dream. Ejaculation that occurs while you are asleep.

**Oil glands**

The glands in the skin that produce oil; if clogged, pimples result.

**Organ**

A part of your body assigned to perform a certain or special function.

**Ovaries**

(OH-var-reez) - Two glands, one on either side of the uterus, that contain a woman's egg cells and produce the hormones estrogen and progesterone.

**Ovulation**

(ah-view-LAY-shun) - The moment at which an egg is released from an ovary.

**Penis**

(PEE-niss) - Male sex organ; also used to evacuate urine.

**Period**

The time when a woman is menstruating.

**Perspiration**

Water secreted by the sweat glands because of hot weather, exercise, or excitement.

**Pimples**

Oil gland ducts that have become clogged with dirt, bacteria, and oil and have become infected.

**Pituitary gland**

(pih-Too-ih-terry) - The gland at the base of the brain which is responsible for producing hormones that regulate growth and development at puberty.

**Prostate gland**

(PRAH-state) - Gland next to the bottom of the bladder; it forms a fluid that combines with sperm and fluid from the seminal vesicles to make semen.

**Puberty**

(PEW-ber-tee) - The state of life during which human males and females become sexually mature.

**Pubic area**

(PEW-bik) - The area where the legs join the body and pubic hair appears during puberty.



**Scrotum** (SKROH-tum) - The sack of skin that hold the testicles, just underneath the penis.

**Semen** (SEA-men) - Also called seminal fluid, t's a white, milky liquid that carries sperm out of the penis during ejaculation.

### **Seminal vesicles**

(SEM-in-nal VEH-si-cahls) - Area where sperm is stored; it also creates a fluid that combines with sperm and fluid from the prostate gland to make semen.

### **Sperm**

The male reproductive cells.

### **Sweat glands**

Glands that secrete water that contains body wastes.

### **Testicles**

(TES-tih-culs) - Also called the testes (TES-teez), the two oval-shaped organs contained in the scrotum

### **Testosterone**

(tes-TAH-stuh-rone) - The male hormone, produced in the testicles, that causes many of the changes that take place in a boy's body during puberty.

### **Urethra**

(you-REE-thrah) - The tube that carries urine from the bladder out of the body. Semen also exits the body through a male's urethra.

### **Uterus**

(YOU-ter-us) - Also called the womb. Muscular organ lined with soft nourishing tissue that carries the fetus until birth.

### **Vagina**

(va-JEYE-na) - The flexible passageway leading the cervix to the outside of the body, through which menstrual fluid flows.

### **Vas deferense**

(vas DEF-a-renz) - Tubes in which sperm is combined with other fluids to make semen.

### **Vulva**

(VUL-va) Female external genital area