

**CLASS 10  
SCIENCE**

**Chapter 8  
How do Organisms Reproduce**

# Reproduction in Human Being

- Human beings show sexual reproduction.
- Male parent produces male gametes called sperms. Female parent produces female gametes called ova.
- Sperms have tail and are therefore, motile. They are produced in large numbers in the testes.
- Ovum is bigger, non-motile and only one ovary produces one ovum in one month.
- There is no food stored in the sperms whereas ova contain stored food.
- Both the gametes are microscopic unicellular and have half the number of chromosomes as compared to the body cells.

# Puberty

- Human beings become reproductively active from the onset of puberty.
- Puberty is the period during adolescence when the rate of general body growth begins to slow down and reproductive tissues begin to mature. Onset of puberty in human males is between 11 to 13 yrs of age, while in human females is between 10 to 12 yrs. of age.
- Puberty is associated with many physical, mental, emotional and psychological changes in boys and girls which occur slowly over a period of time. These are called secondary sexual characters. For instance thick dark hair start growing in new parts of the body such as arm pits and genital area between the thighs. Thinner hair appear on legs, arms and face. Skin becomes oily and pimples may appear on the face. Individuals become more conscious of their bodies become more independent, more aggressive etc.

# Puberty

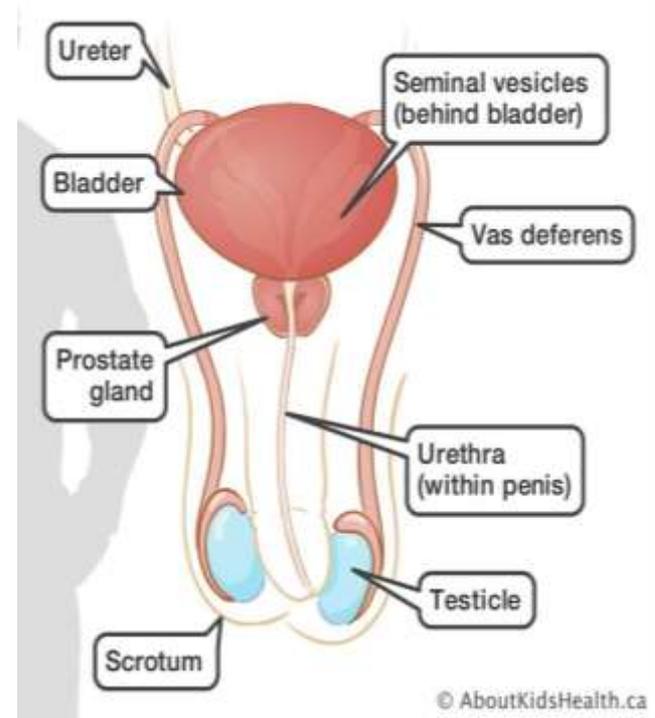
- In case of boys beard and mustache start appearing, voice begins to crack, reproductive organs develop and start producing releasing sperms.

In case of girls, breast size begins to increase, skin of the nipples darkens, menstruation starts.

The act of mating between the male and female partner is termed as copulation.

# Male Reproductive System

- Male reproductive system consists of the following components
- 1 pair of testes
- A system of ducts
  - Epididymis
  - Vas deferens or the sperm duct
  - Urethra
- A system of glands
  - Seminal vesicles
  - Prostrate gland
  - Cowper's gland
- A copulatory organ called a penis.



# Testes

- One pair of testes are present in a bag-like structure called scrotum which lies outside the abdominal cavity, hence they are extra abdominal in position. This is so because the testes have to be maintained at 1-3 degree lesser temperature than the body in order to produce functional sperms.
- Testes release a male sex hormone called **testosterone** and its function is to:
  - 1. Regulate the production of sperm
  - 2. Bring about changes in appearance seen in boys at the time of puberty.

# Functions of testes

- To produce male gametes i.e. the sperms.
- To produce a male reproductive hormone called testosterone which is responsible for producing sperms as well as secondary sexual characteristics in males.

# A system of ducts

- Attached to each testis is a highly coiled tube called epididymis. The sperms are stored here and they mature in the epididymis.  
Each epididymis leads into the sperm duct or the vas-deferens. Each vas-deferens rises up and enters into the abdominal cavity. It unites with the duct coming from the urinary bladder to form a common duct called urethra which passes through the penis and opens to the outside. Along the way the ducts of the three glands also open and pour their secretions into the vas deferens.

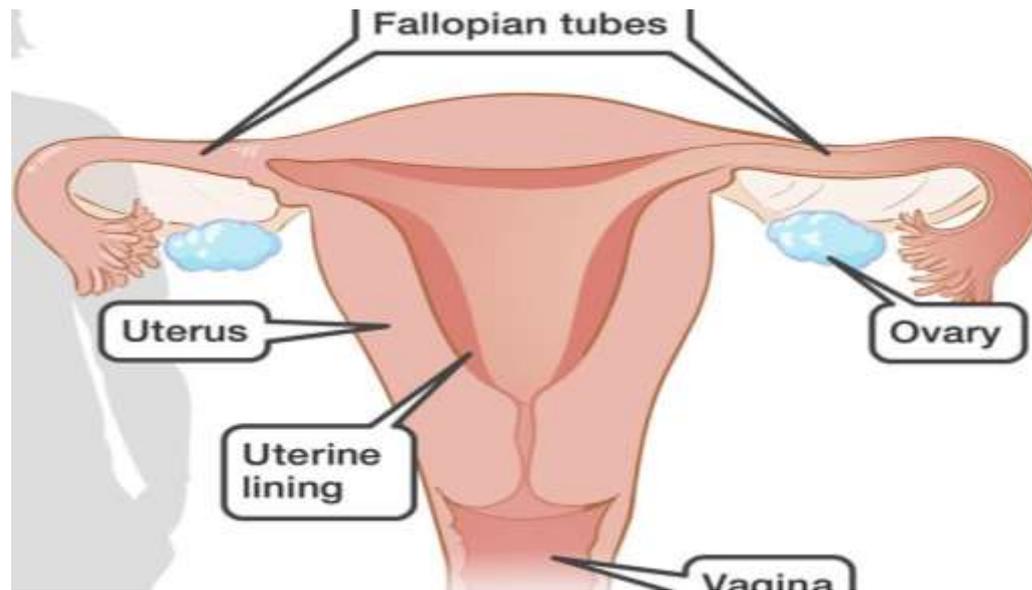
- **Function of the vas-deferens:** It is meant for the passage of the sperms in the male body.
- **Functions of the glands:** They produce different secretions which provide nutrition as well as medium for locomotion to the sperms.  
The secretions of the three glands along with the sperms is known as semen.
- **Function of the urethra:** It is the common passage for both semen and urine from the body to. the outside.

### **Penis:**

- It is the organ which is used to introduce semen into the female body. It is richly supplied with blood vessels.

# Female Reproductive System

- It consists of the following components
- 1 pair of ovaries
- 1 pair of fallopian tubes or oviducts
- A uterus/womb
- A vagina/birth canal.



# Ovary

- Each ovary is almond shaped and present inside the abdominal cavity. At the time of birth each girl child already contains thousands of immature ova. These ova start maturing only from the time of puberty. Only one ovum is produced by one ovary in one month and each ovary releases an ovum in alternate months. The release of an ovum from the ovary into the abdominal cavity is known as ovulation.

# Functions of ovary

- To produce and release ova
- To produce female reproductive hormones: estrogen and progesterone.

# Fallopian tubes

- There are two fallopian tubes. The end lying close to the ovary has finger like structures called fimbriae. The two fallopian tubes unite to form an elastic bag like structure called uterus.
- **Function of the fallopian tubes:** It is the site of fertilization between the male and the female gametes and formation of the zygote early embryo.

# Uterus

- The inner lining of the uterus is richly supplied with blood vessels and is known as endometrium. The narrow end of the uterus is called cervix.
- **Function of the uterus:** The embryo formed in the fallopian tube comes down and gets attached to the endometrium (implantation) and develops for the next nine months till the baby is delivered.

# Vagina:

- The uterus opens into the vagina through the cervix. The vagina is a muscular tube through which the baby is delivered at the end of nine months. It also serves as the canal for receiving the semen at the time of copulation.
- The semen is discharged into the vaginal tract during copulation. The sperms travel upwards and reach the fallopian tube where one sperm fuses with the ovum to form the zygote. The zygote divides and redivides as it descends into the uterus and the embryo gets implanted in the endometrium. The endometrium thickens so as to receive the embryo

- The embryo gets nutrition from the mother's blood with the help of a special tissue called placenta, which is a disk-like structure embedded in the uterine wall. It contains finger-like villi on the embryo side, while on the mother's side blood spaces surround the villi. Villi provides a large surface area for glucose and oxygen to pass from the mother to the developing embryo and the wastes to pass from the embryo to the mother through the placenta. When the embryo starts resembling a human is formed, it is termed as a foetus. The foetus continues to develop inside the uterus for almost nine months after which the baby is delivered as a result of rhythmic contractions of the uterine muscles.

# Menstruation

- It is the loss of blood, mucous along with the unfertilized ovum and the ruptured cells and tissues of the endometrium through the vagina of the female. It is a 28-day cycle which occurs in every reproductively active female (from puberty). The flow of blood continues for 2 to 8 days. If the ovum does not get fertilized, then the endometrium starts sloughing off and there is loss of blood and mucous etc. through the vagina. In case the ovum gets fertilized, then the endometrium becomes thick and spongy for nourishing the embryo and hence menstruation does not occur. A lady with a developing embryo in her womb is termed as pregnant. The beginning of menstruation at puberty is known as menarche. The stoppage of menstruation when the woman is 45-55 yrs of age is called menopause.

# Reproductive Health:

- Sexually transmitted diseases and birth control.

A number of diseases occur as a result of sexual intercourse if one of the partners is infected. These are known as sexually transmitted diseases (STD's). They can be caused by bacteria for example; syphilis, gonorrhoea; or caused by a virus for example; HIV-AIDS, warts etc. The transmission of these diseases can be avoided by using birth control measures such as wearing a condom during the sexual act.

# Birth control measures

- They can be mechanical, chemical and surgical.
- **Mechanical methods:** These are used to prevent the passage of semen to the fallopian tube :
  - (i) Use of condoms: Condoms are thin rubber tubes worn over the penis before sexual intercourse. The semen gets collected in this and is not discharged into the vagina.
  - (ii) Diaphragm: It is a thin rubber fixed over a flexible metal ring which is fitted over the cervix in a woman's body by a doctor.
  - (iii) Intra Uterine Contraceptive Device (IUCD) or loop: It is inserted in the uterus and its insertion causes certain secretion which prevents the implantation of the embryo in the uterine wall.Both methods (ii) and (iii) cause side effects.

# Chemical methods

- Use of spermicides: These are strong sperm-killing chemicals available in the form of creams, jellies etc. which are injected into the vagina just before copulation.
- Oral contraceptive pills: These are hormonal pills which prevent ovulation but do not stop menstruation.

# Surgical methods

- **Vasectomy:** It involves cutting and ligating the vas deferens in males.
- **Tubectomy:** It involves cutting and ligating Reproductive organs the fallopian tubes in females.
- **Medical termination of pregnancy (MTP) or abortions** is carried out to eliminate the developing embryo. This practice can, however, be misused to carry out female foeticide which involves the killing of the female foetus. It should be avoided at all cost as it disturbs the male-female ratio in a population.



**Chapter  
Completed**