

CHAPTER - 8

HOW ORGANISMS REPRODUCE

Class

:- X

Subject

:- Science

1) Reproduction :-

Reproduction is the process by which living organisms produce new individuals of the same species.

Reproduction is necessary for the survival and increase in the population of a species. If organisms do not reproduce, their population decreases and species will become extinct.

2) Do organisms create carbon copies of themselves ?

The DNA (Deoxyribo nucleic acid) molecules in the chromosomes in the nucleus is responsible for the transfer of characters from the parents to the off springs. During reproduction the reproductive cells produce two copies of the DNA which separate into two cells. The DNA copies will be similar but not identical to each other. So the new individuals have slight variations from their parents. This is the basis for variations and evolution of new species.

3) The importance of variation :-

DNA copying during reproduction is important for maintaining the body designs of different organisms to survive in the existing environment. But the environment is constantly changing due to changes in temperature, climate, water levels etc. If organisms cannot adjust themselves to the changes in the environment then their species will become extinct.

If there are variations in some individuals of a species they may be able to survive the changes in the environment.

So variations in species is necessary for the survival of different species and for the evolution of new species.

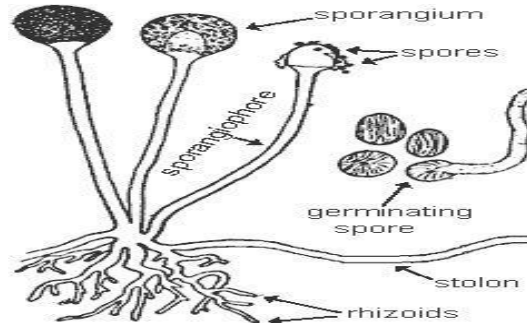
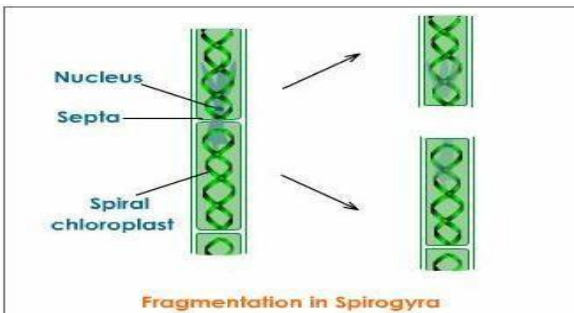
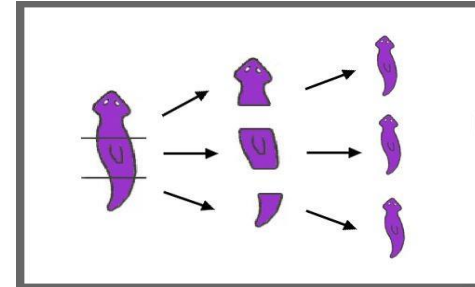
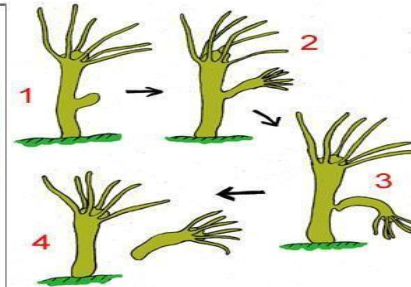
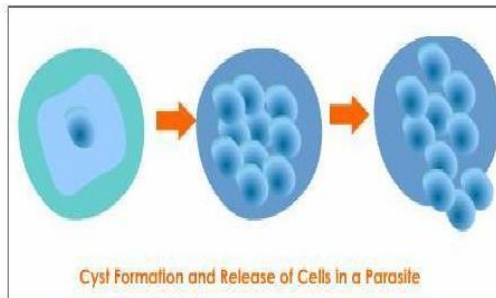
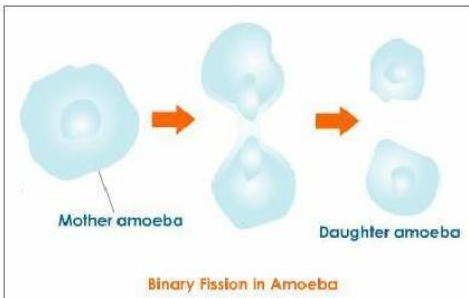
4) Types of reproduction :-

There are two main types of reproduction in living organisms. They are **asexual reproduction** and **sexual reproduction**.

Asexual reproduction :- is reproduction in which new individuals are produced from a single parent.

Sexual reproduction :- is reproduction in which two individuals are involved to produce a new individual.

Asexual reproduction is of different types. They are:- **fission**, **budding**, **regeneration**, **fragmentation**, **spore formation**, **vegetative propagation** etc.

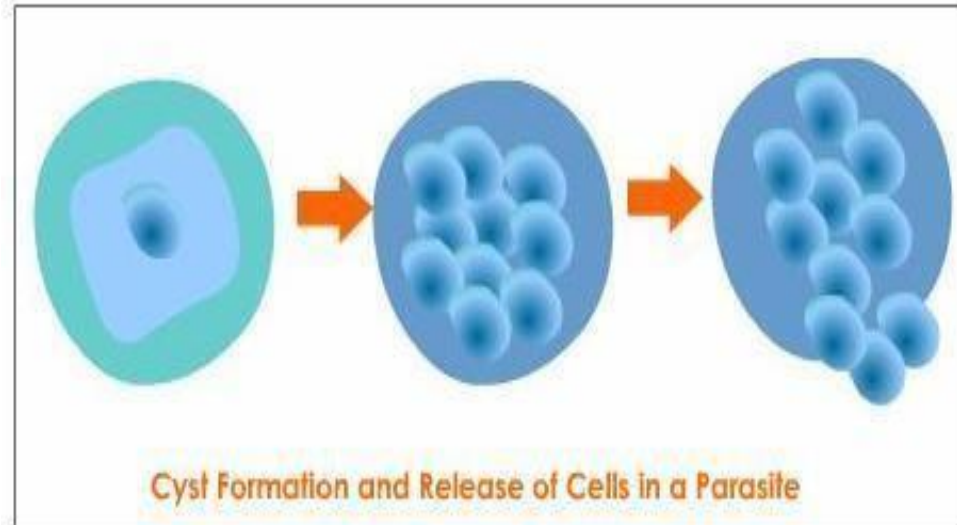
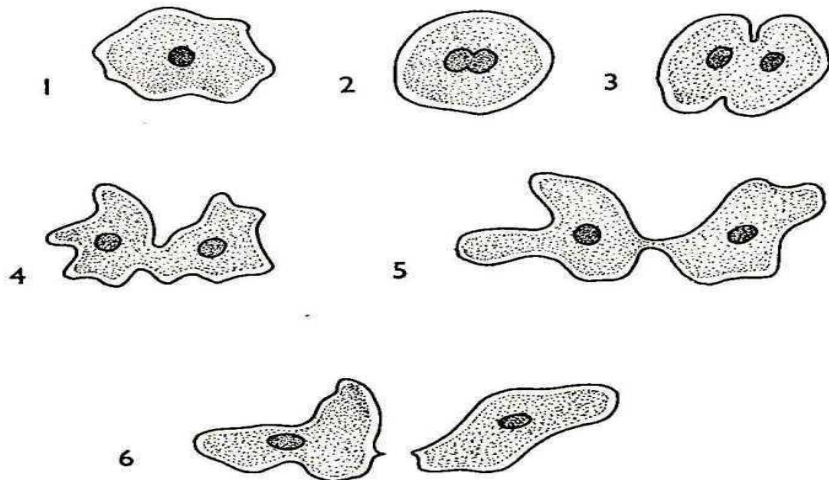


i) Fission :-

Fission is an asexual reproduction by which a unicellular organism divides and forms two or more new individuals. Fission is of two types. They are **binary fission** and **multiple fission**.

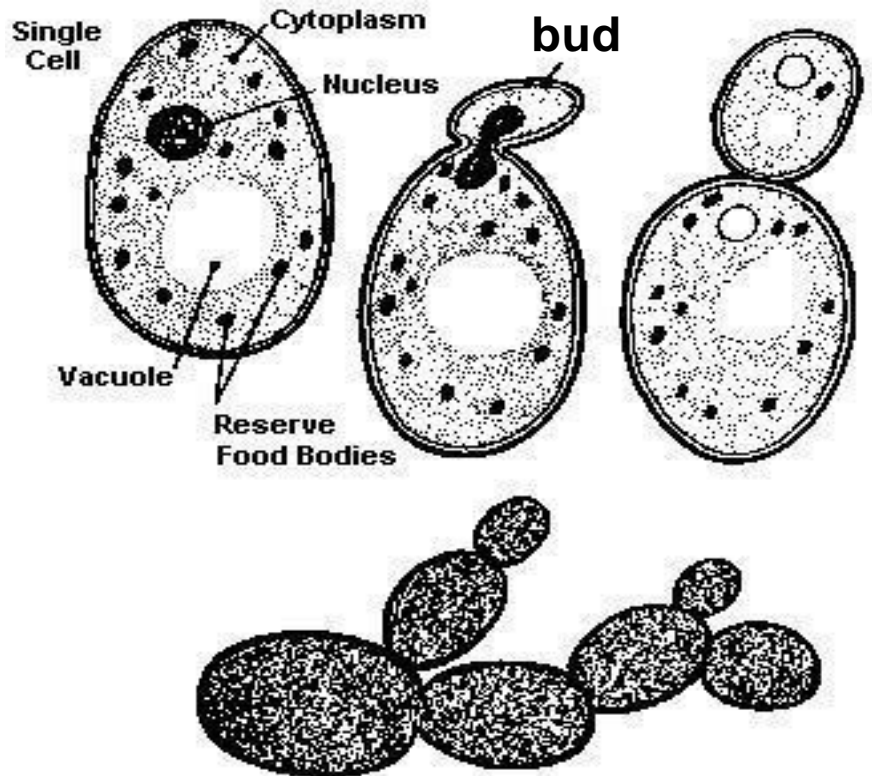
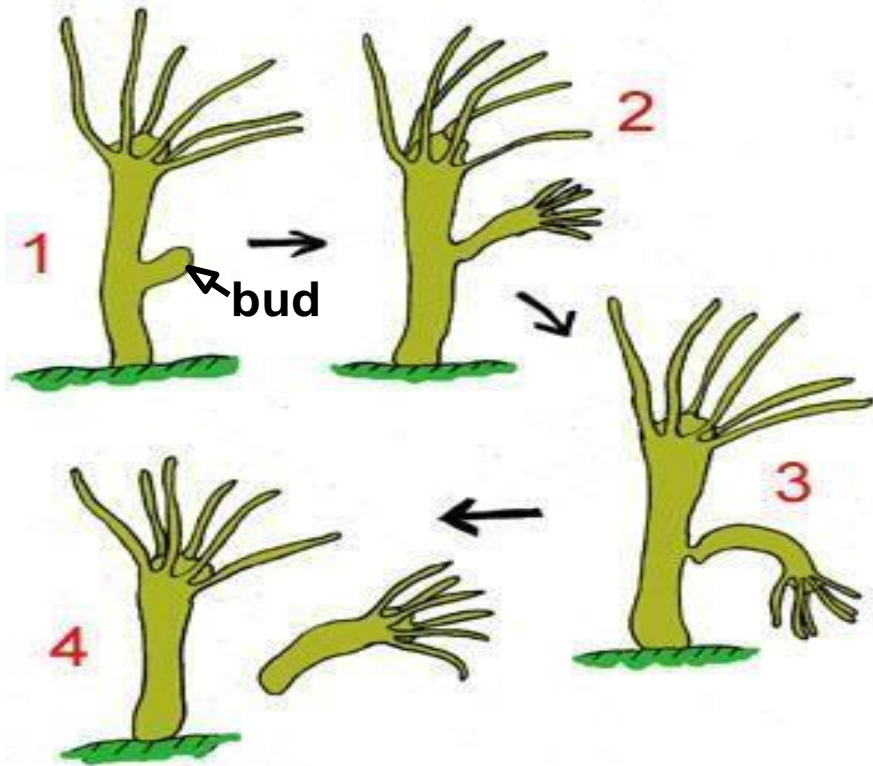
i) Binary fission :- In this method an organism divides and forms two individuals. First the nucleus divides and forms two nuclei. Then the cytoplasm divides and forms two daughter cells. Eg:- Amoeba, Paramecium etc.

ii) Multiple fission :- In this method one organism divides into many daughter cells. Eg. Plasmodium (Malarial parasite).



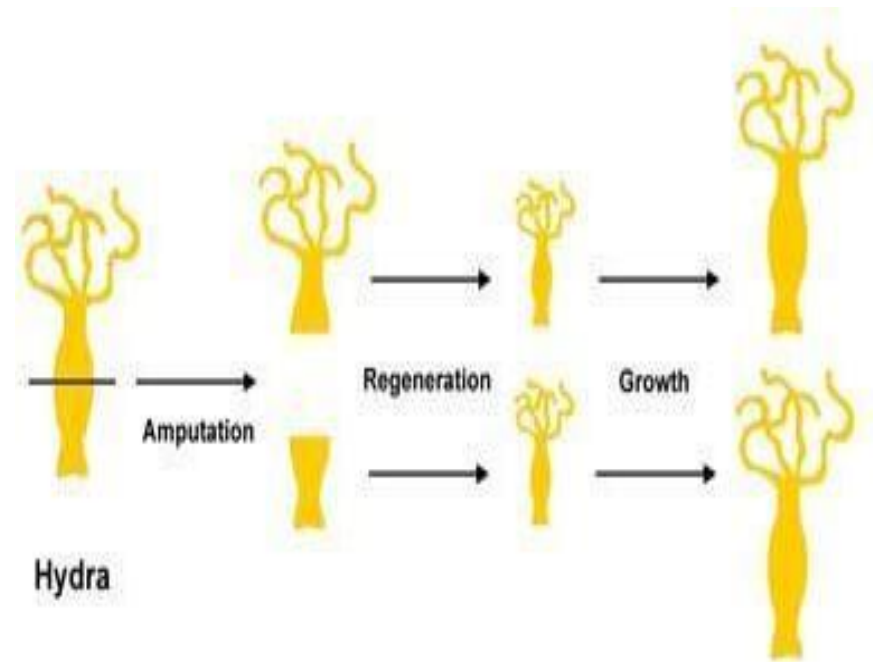
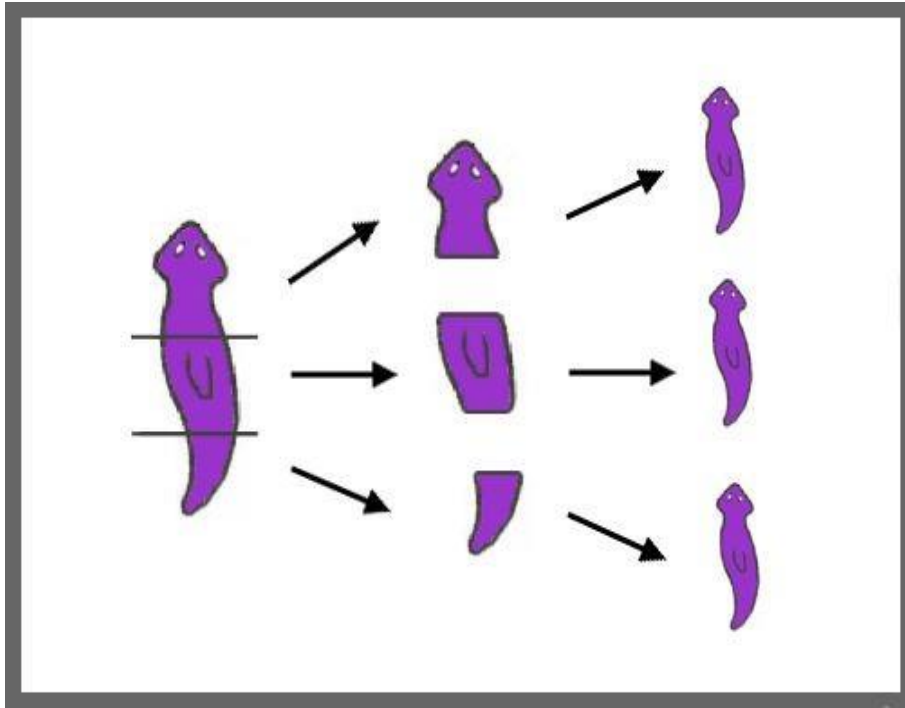
ii) Budding :-

In this method a bud like projection is formed on the body of the organism. The bud then develops into a new individual. It then separates from the parent and forms an independent individual. Eg:- Hydra, Yeast etc.



iii) Regeneration :-

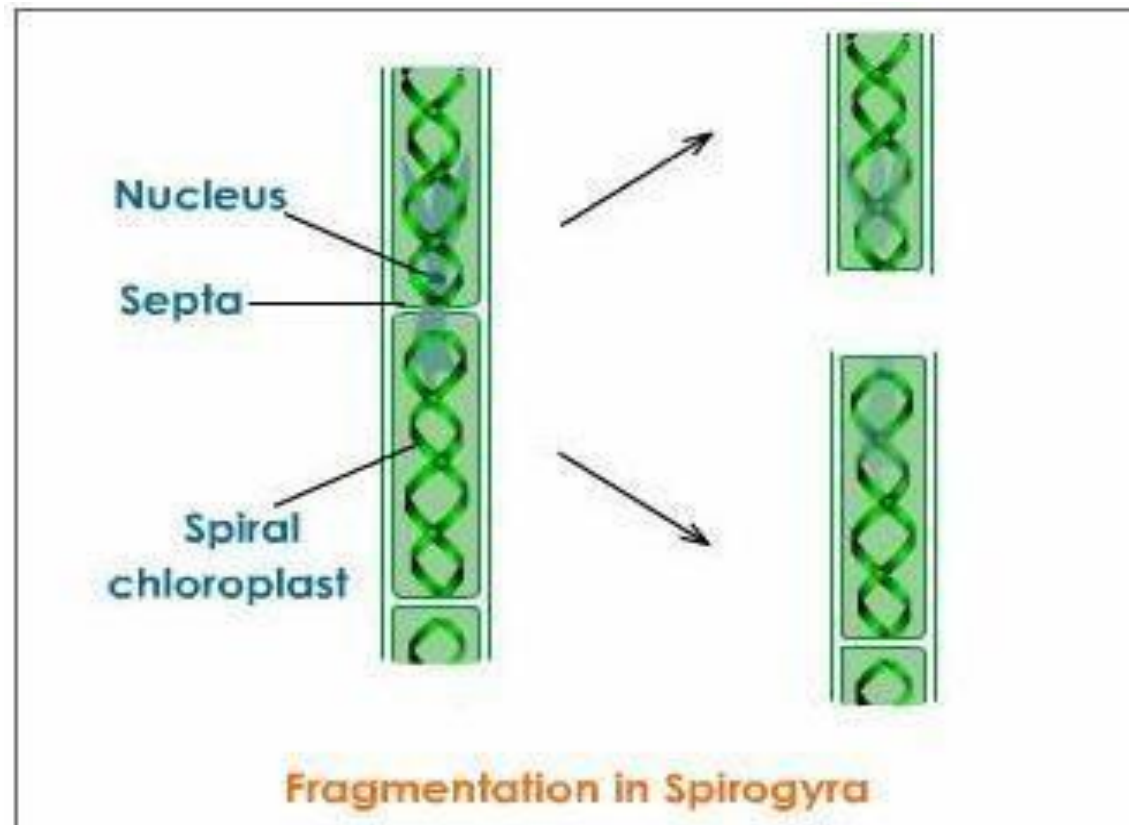
In this method a part of the body of the organism if cut or broken can develop into a new individual. Eg :- Hydra, Planaria, Star fish etc.



iv) Fragmentation :-

In this method the body of a simple multicellular organism breaks up into smaller pieces on maturation and each fragment develops into new individuals.

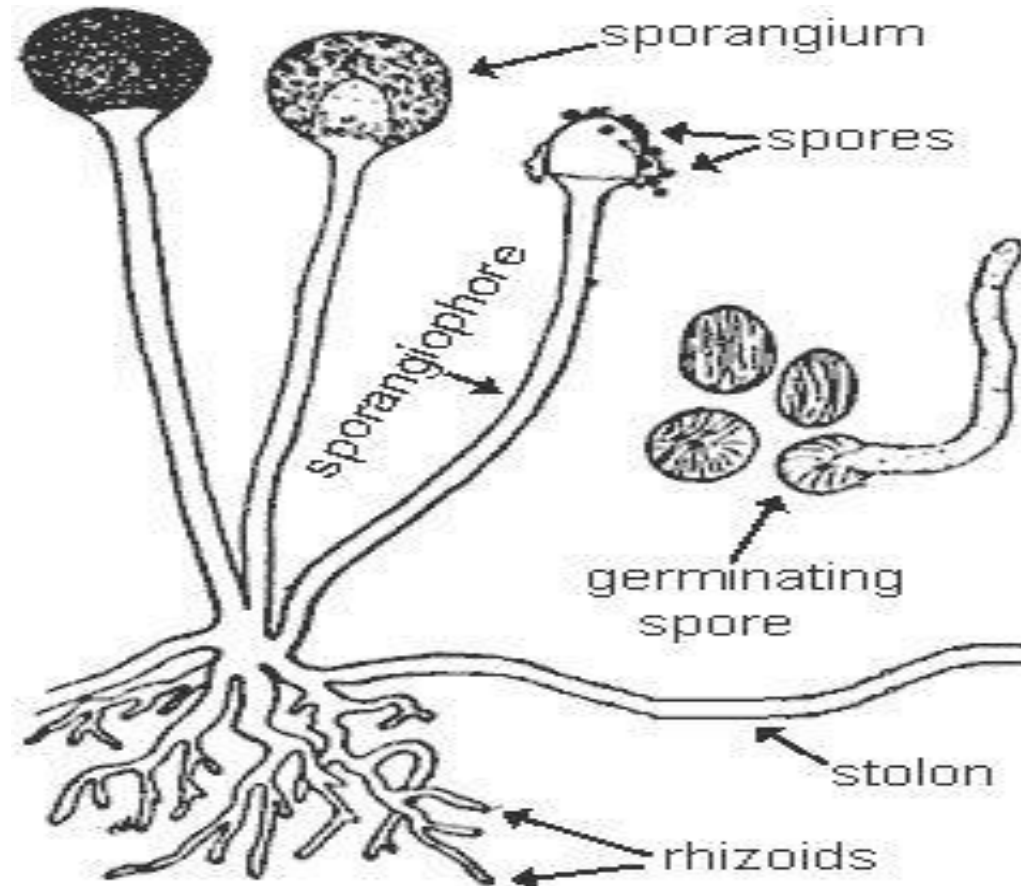
Eg :- Spirogyra.



v) Spore formation :-

In this method structures called sporangia produce tiny cells called spores. When the spores come in contact with a moist surface, it develops into new individuals.

Eg :- Rhizopus , Mucor, Penicillium etc.



vi) Vegetative propagation :-

In this method new plants are produced from the vegetative parts of the plant like root, stem or leaf. Eg:- from roots – dhalia, sweet potato, from stem – potato, ginger, from leaf – bryophyllum, begonia.

Plants produced by vegetative propagation produce flowers and fruits earlier than those produced from seeds. It also helps in the propagation of plants which do not produce seeds like rose, jasmine banana etc.

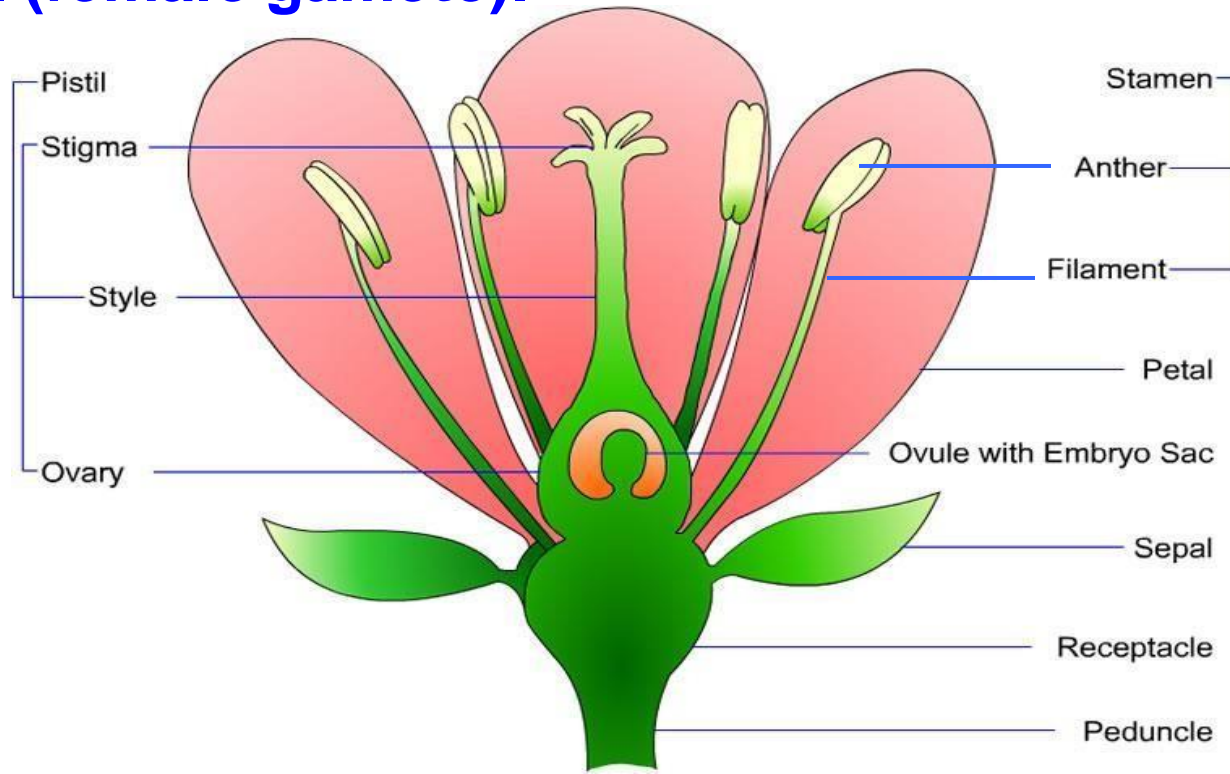
Vegetative propagation can also be done artificially by cutting, layering, grafting etc.



5) Sexual reproduction in flowering plants :-

a) Reproductive parts of a flower :-

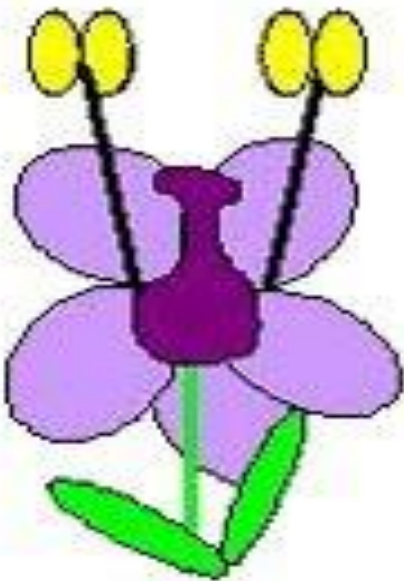
The stamen and pistil are the reproductive parts of the flower. **Stamen** is the male reproductive part. It produces pollen grains in the **anther** which contains the male germ cell (male gamete). Pistil is the female reproductive part. It produces ovules in the **ovary** which contain the female germ cell (female gamete).



b) Pollination :-

The transfer of pollen grains from the anther to the stigma of a flower is called **pollination**. It takes place by wind, water or insects. If the pollen grains are transferred from the anther to the stigma of the same flower it is **self pollination** and if it is transferred from the anther of one flower to the stigma of another flower it is cross pollination. Pollination takes place by insects, wind, water etc.

POLLINATION



Self pollination



FLOWER 1



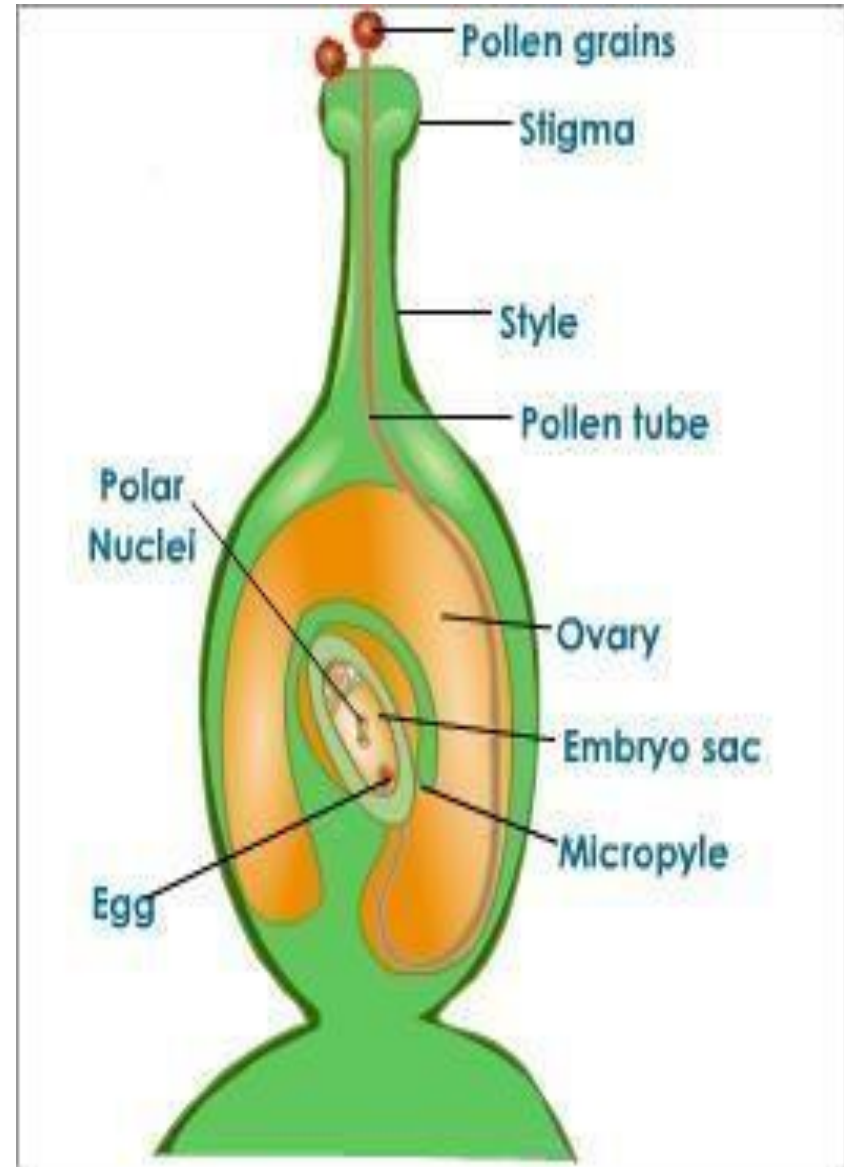
FLOWER 2

Cross pollination

c) Fertilisation :-

After the pollen grain is transferred to the stigma it produces a pollen tube which passes through the style and enters the ovary and ovule. In the ovule the male germ cell (male gamete) fuses with the female germ cell (female gamete) to form a zygote. This process is called **fertilisation**.

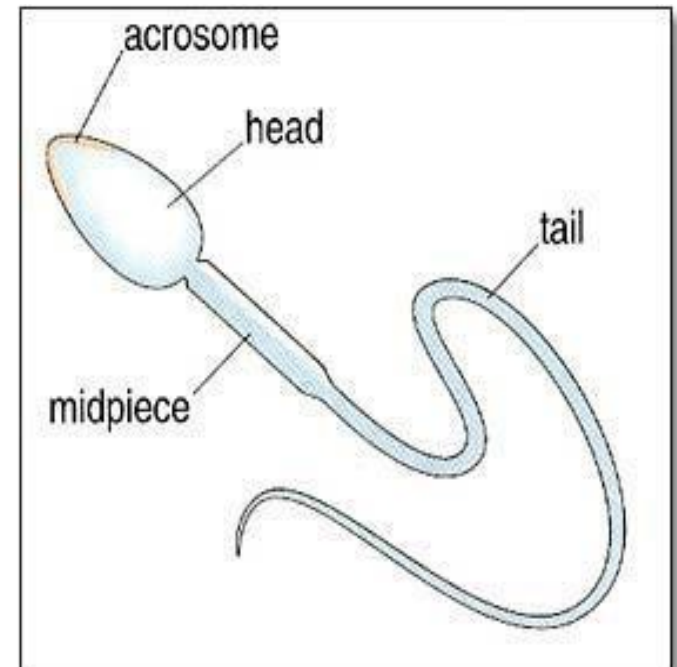
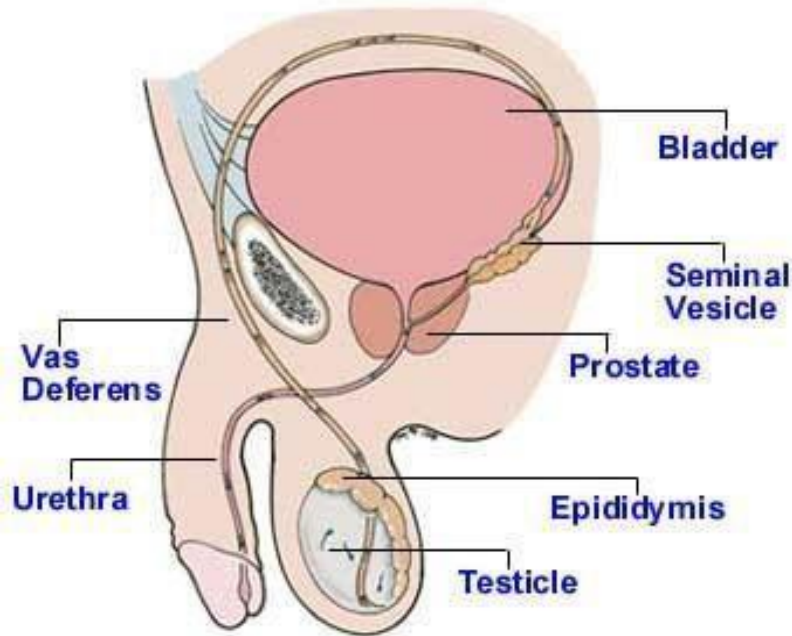
After fertilisation the zygote divides several times and forms the **embryo** which then develops into the **seed** and the **ovary** develops into the **fruit**.



6) Reproduction in human beings :-

a) Male reproductive system :-

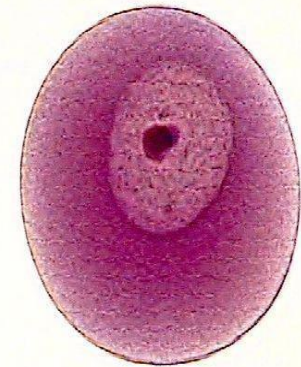
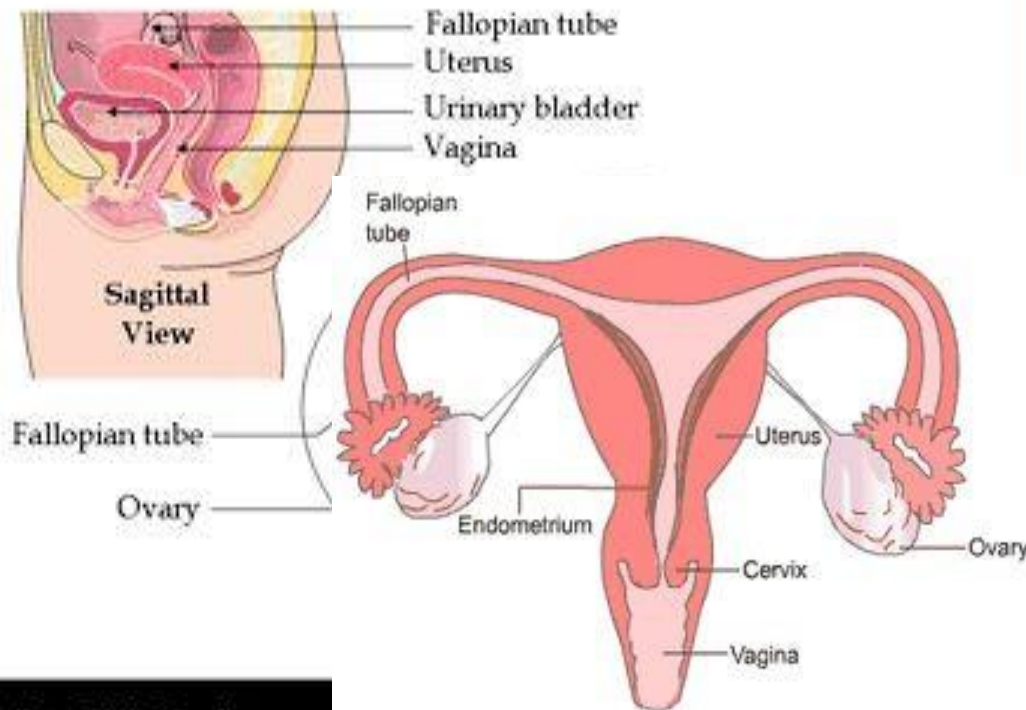
The male reproductive system consists of a pair of testes which produces the male reproductive cells called sperms and the hormone testosterone. It is contained in sac like structures called scrotum. From each testis arises a tube called vas deferens. It joins into the urethra. The urethra is enclosed in a muscular organ called penis. It has an opening called genital pore. The seminal vesicles and prostate glands produce fluids which provide nutrition and help in the movement of the sperms.



b) Female reproductive system :-

The female reproductive system consists of a pair of ovaries which produces the female reproductive cells called ova or eggs and the hormone oestrogen. Above the ovaries are tubes called oviducts or fallopian tubes. The two oviducts unite into a bag like structure called uterus. The uterus has opening called vagina.

Human Female Reproductive System



Human ovum (egg)

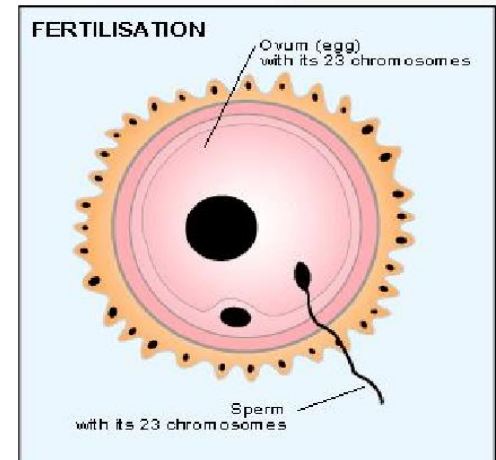
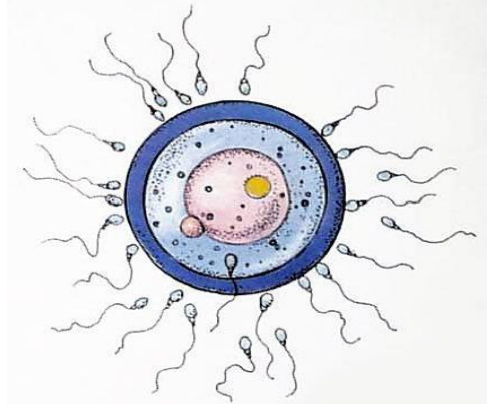
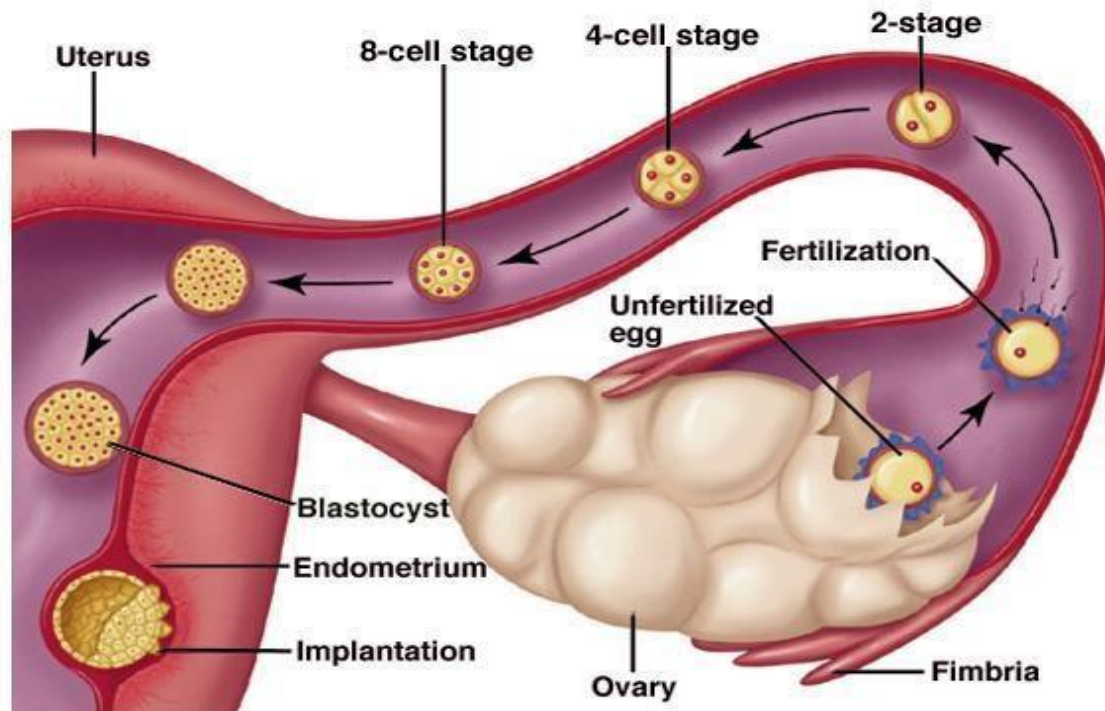


c) Fertilisation in human beings :-

During sexual intercourse the sperms from the male enters into the vagina of the female. The sperms reaches the oviduct. One sperm fuses with an egg and forms a zygote. The zygote then gets implanted in the uterus. The zygote then starts dividing to form an embryo. The embryo gets nutrition from the mother's blood through the placenta. The development of the child takes nine months and then the child is born.

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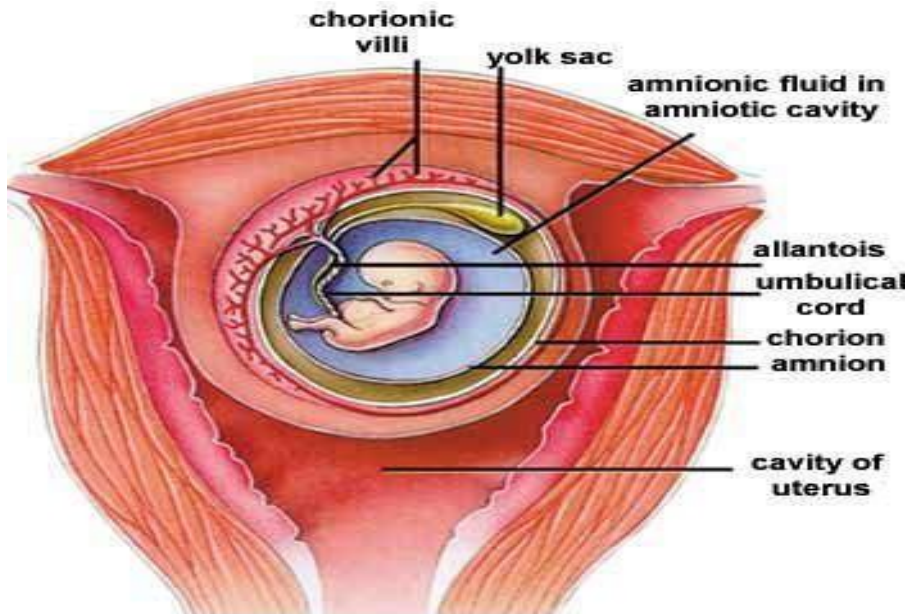
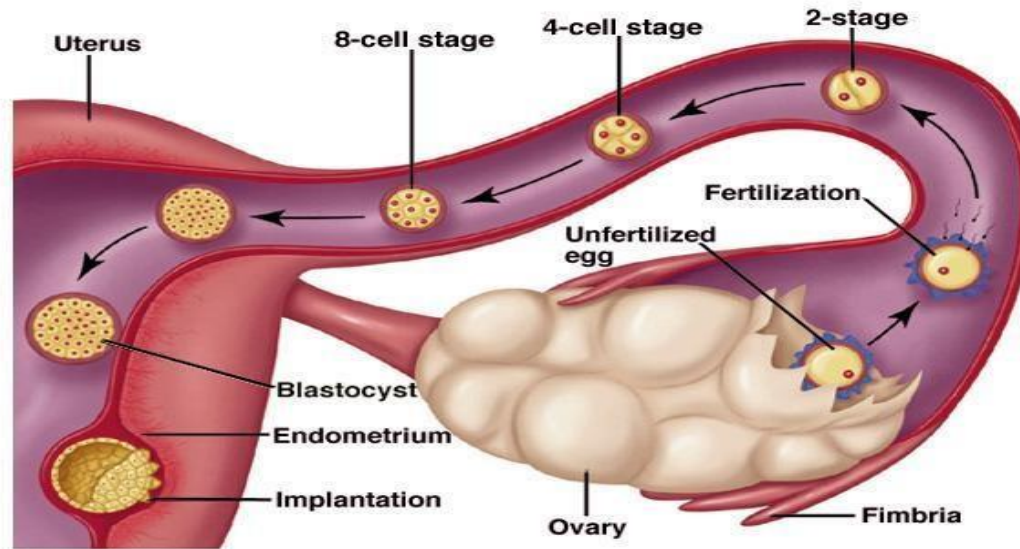
Stages of Development-Early Embryo



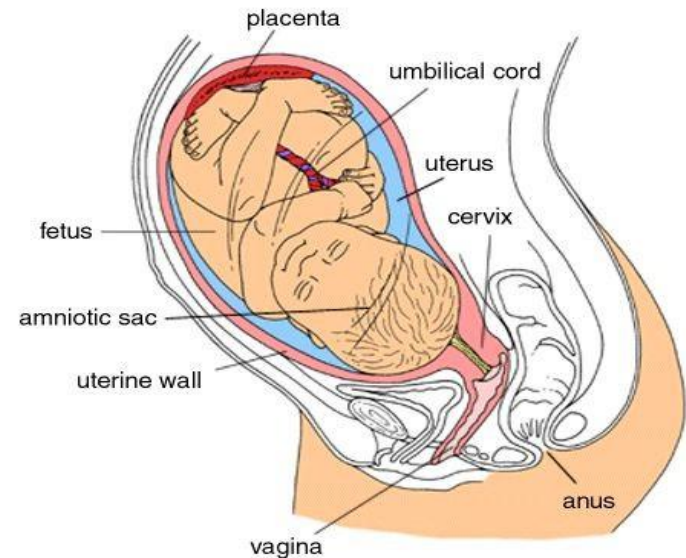
Stages in the early development of the embryo

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Stages of Development-Early Embryo



Fetus in Utero



d) Menstruation :-

The ovary produces one egg every month and the uterus prepares to receive the fertilised egg. Its wall becomes thick and spongy with blood vessels for nourishing the embryo. If fertilisation does not take place then the uterus wall breaks and comes out of the vagina as blood and mucus. This cycle takes place once every month and is called **menstruation**.

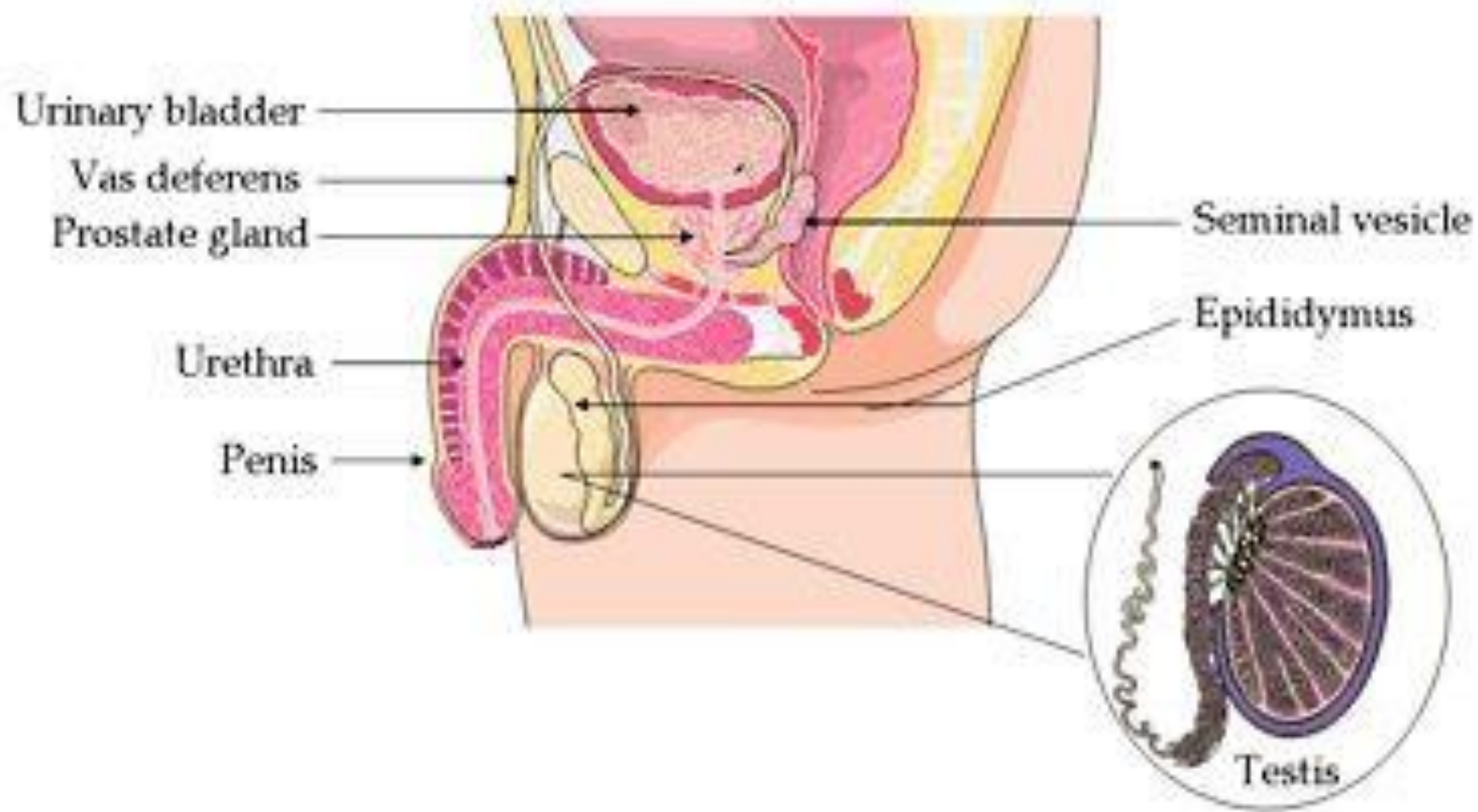
7) Reproductive health :-

a) Sexually transmitted diseases :- *are diseases transmitted through sexual contact. They may be bacterial infections like gonorrhoea and syphilis etc. or viral infections like warts and HIV-AIDS.*

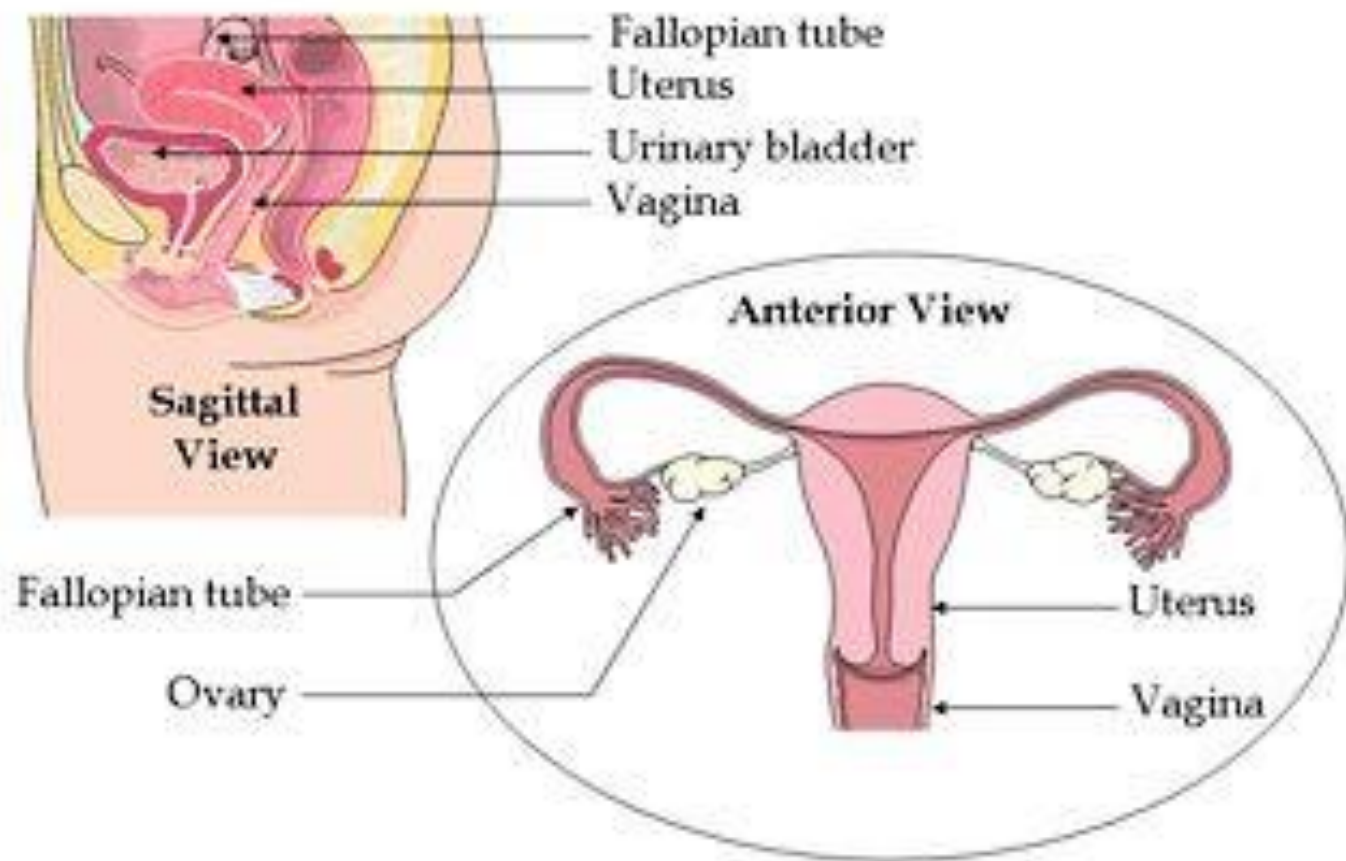
b) Prevention of pregnancy (Contraception) :-
Pregnancy can be prevented by three main methods. They are barrier methods chemical methods and surgical methods.

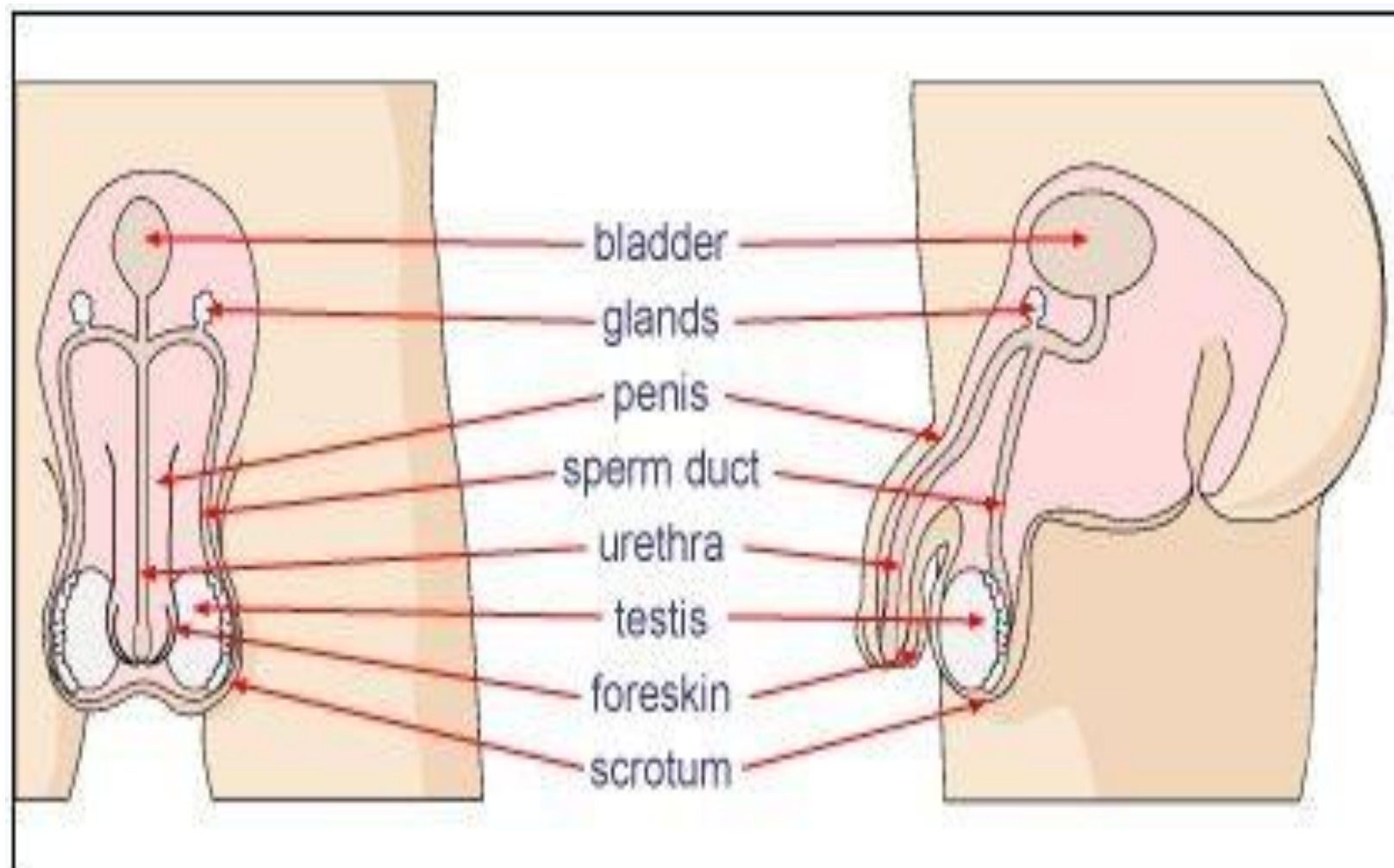
- i) **Barrier methods** consists of using condoms, diaphragm, cervical caps, Copper T etc.*
- ii) **Chemical methods** consists of taking drugs like oral pills, vaginal pills etc.*
- iii) **Surgical methods** consists of removing or tying a small part of the vas deferens in males (**Vasectomy**). or fallopian tube in female (**Tubectomy**).*

Human Male Reproductive System

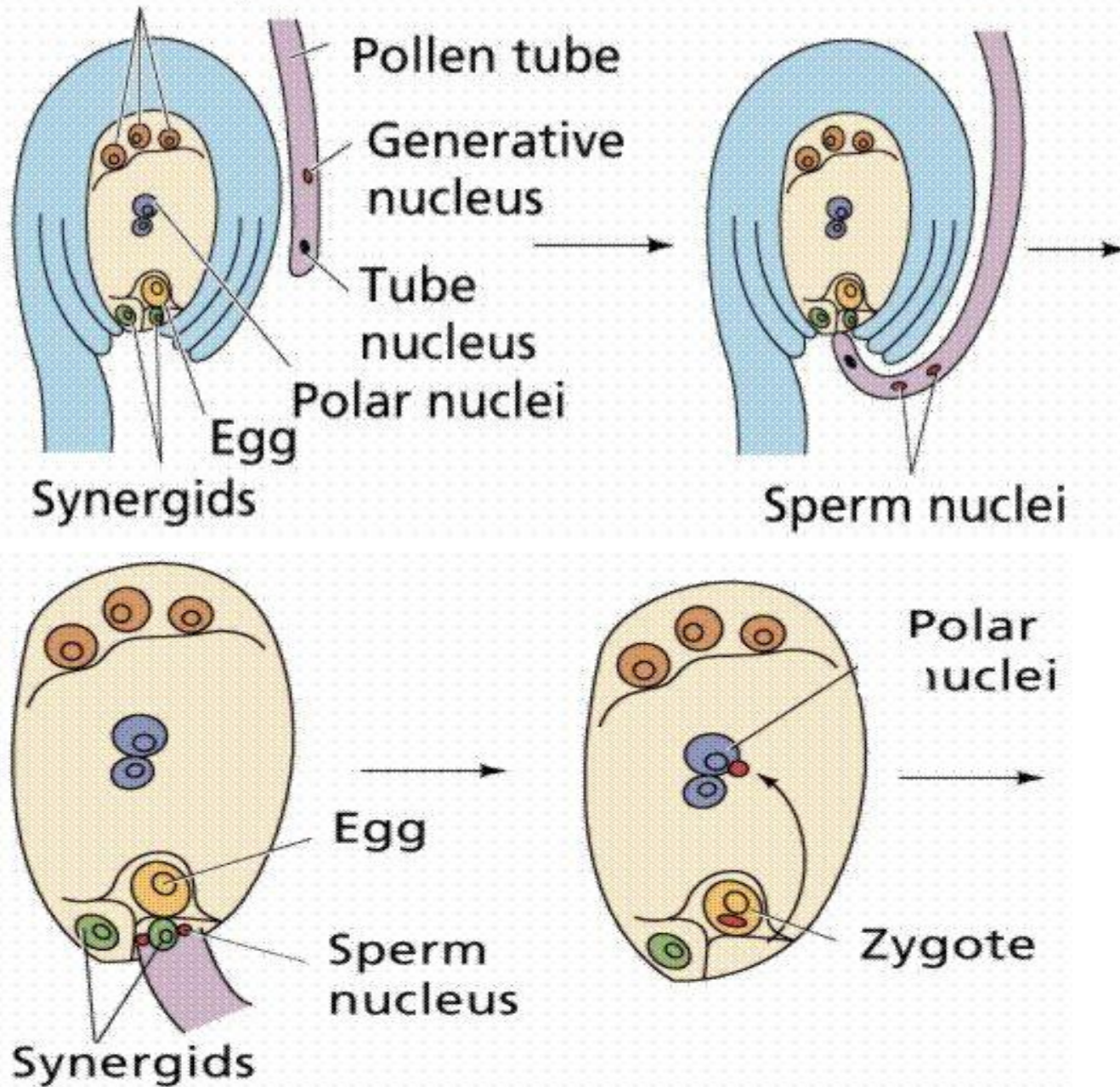


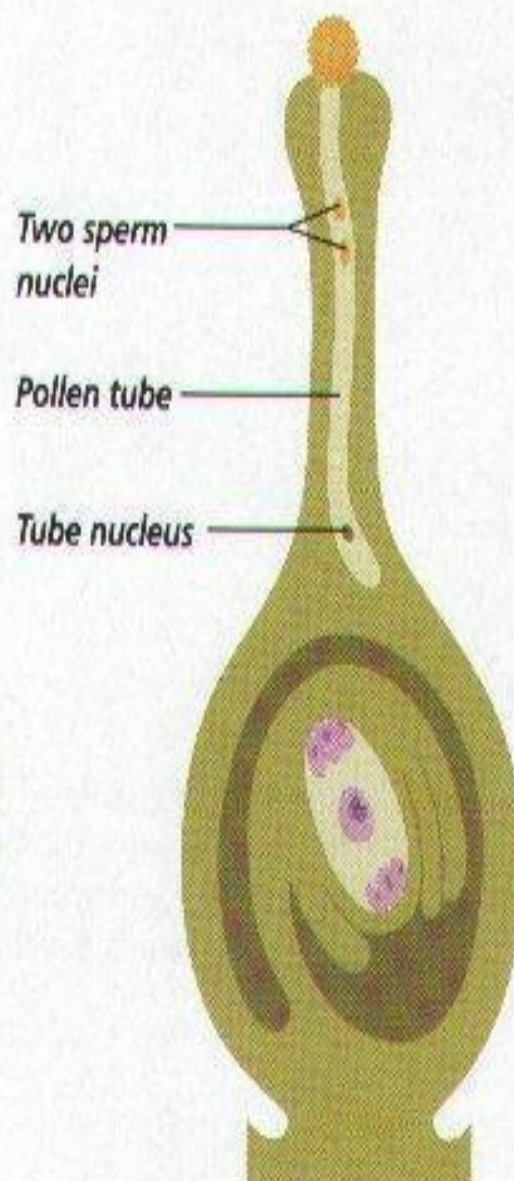
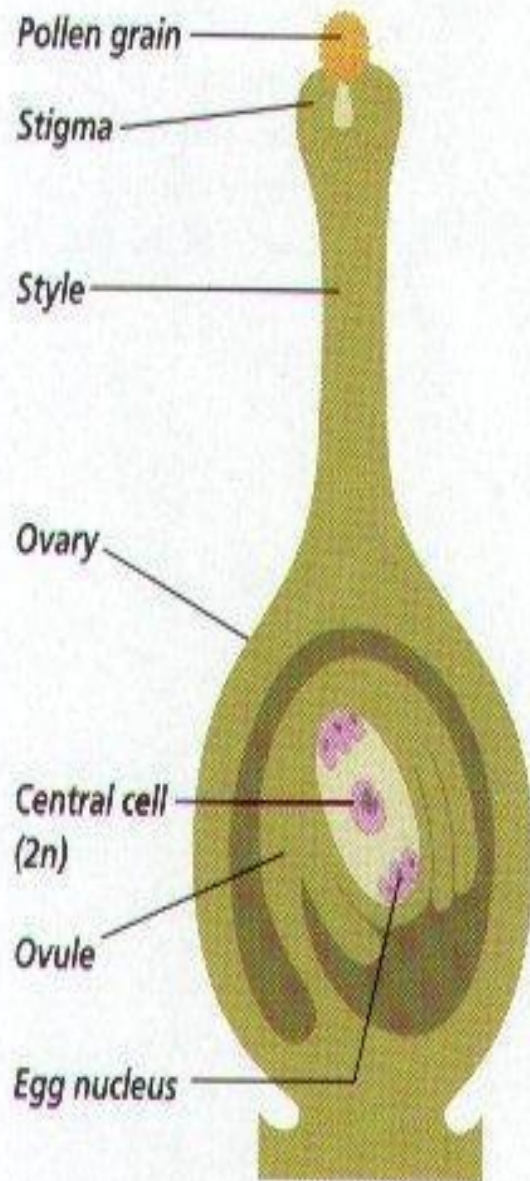
Human Female Reproductive System





Three antipodal cells





Double Fertilization



