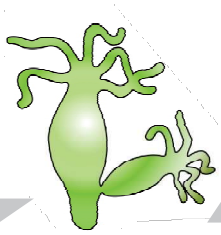


Chapter - 8

# How do Organisms Reproduce

- Reproduction is the process by which living organisms produce new individuals similar to themselves. It ensures continuity of life on earth.
- Nucleus of the cell contains DNA (Deoxyribose Nucleic Acid) which is the heredity material.
- DNA replicates and forms new cells causing variation. So, these new cells will be similar but may not be identical to original cell.
- Variations are useful for the survival of the individual and species over time as well as basis for evolution.

## Types of Reproduction

**(a) Asexual Reproduction**

- A single individual give rise to new individual.
- Gametes are not formed.
- New individual is identical to parent.
- It is extremely useful as a means of rapid multiplication.
- Adopted by lower organisms.

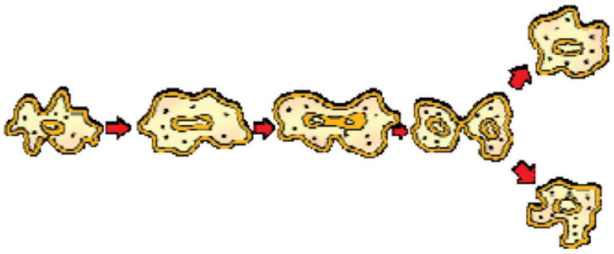
**(b) Sexual Reproduction**

- Two individuals i.e., one male and one female are needed to give rise to new individual.
- Gametes are formed.
- New individual is genetically similar but not identical to parents.
- It is useful to generate more variations in species.
- Adopted by higher organisms.

## Modes of Asexual Reproduction

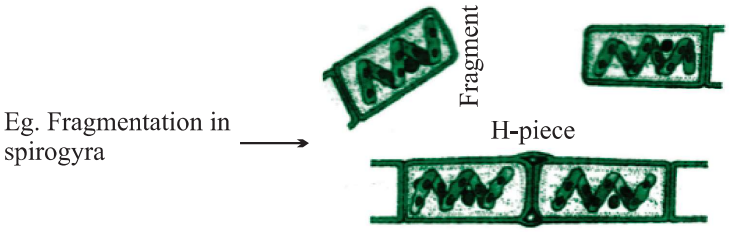
**(i) Fission :** The parent cell divides into daughter cells.

- **Binary fission :** 2 cells are formed. *E.g.,* amoeba.
- **Multiple fission :** Many cells are formed. *E.g.,* Plasmodium.



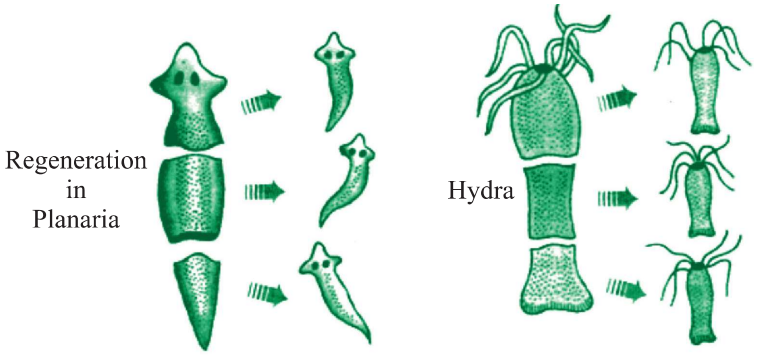
**Binary fission in Amoeba**

**(ii) Fragmentation :** The organism breaks-up into smaller pieces upon maturation, each piece develops into new individual. *E.g.,* Spirogyra.



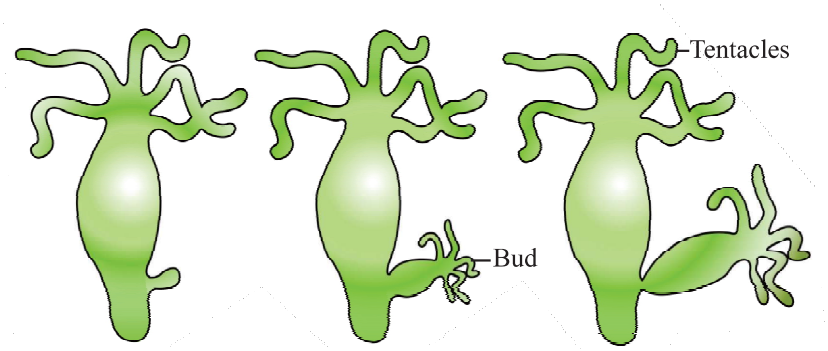

**Fragmentation in Spirogyra**

**(iii) Regeneration :** If organism is somehow cut or broken into many pieces, each piece grows into a complete organism. *E.g.,* Planaria, Hydra.




**Regeneration in Planaria and Hydra**

**(iv) Budding :** A bud is formed which develops into tiny individual. It detaches from parent body upon maturation and develops into new individual. *E.g.,* Hydra




**Budding in Hydra**

**(v) Vegetative Propagation :** In many plants, new plants develops from vegetative parts such as :

- By roots : *E.g.,* dahlias, sweet potato.
- By stem : *E.g.,* potato, ginger.
- By leaves : *E.g.,* bryophyllum (leaf notches bear buds which develop into plants).
- Artificial methods :

(a) Grafting : *E.g.,* Mango

(b) Cutting : *E.g.,* Rose

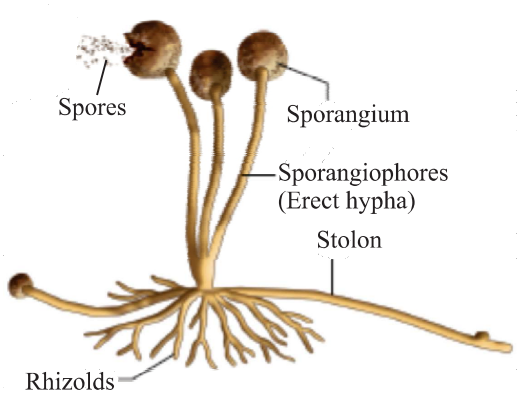
(c) Layering : *E.g.,* Jasmine

(d) **Tissue culture :** New plants are grown by using growing tip of a plant. These growing cells are kept in a culture medium leads to the formation of callus. Callus is then transferred to hormone medium which causes growth and differentiation. *E.g.,* ornamental plants, orchid.

## Benefits of tissue culture :

- We can grow plants like banana, rose, jasmine etc. that have lost the capacity to produce seeds.
- New plants are genetically similar to parents.
- Helps in growing seedless fruits.

**(vi) Spore Formation :** Spores are small bulb like structures which are covered by thick walls. Under favourable conditions, they germinate and produce new organism.




**Spore formation in Rhizopus**

## Sexual Reproduction

When reproduction takes place as a result of the fusion of male and female gametes is called sexual reproduction.

Fusion of gametes is called fertilization which results in variation.

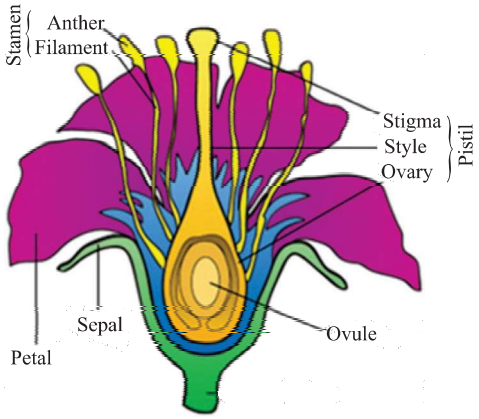
## Sexual Reproduction in Plants

- Flowers are the reproductive organs of plants.
- A typical flower consists of four main whorls namely sepals, petals, stamen and pistil.

## Types of Flowers

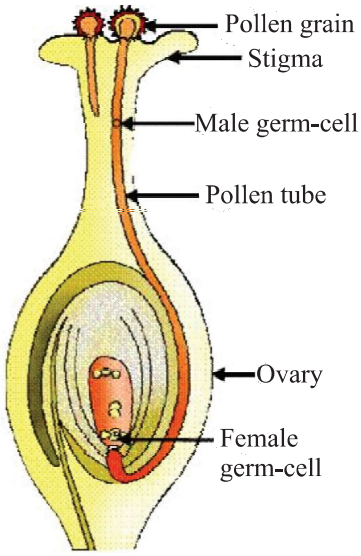
- **Bisexual flower :** Both male and female reproductive parts are present. *E.g.,* Hibiscus, mustard.
- **Unisexual flower :** Either male or female reproductive part is present. *E.g.,* Papaya, watermelon.

## Structure of Flower :



## Process of Seed Formation

- Pollen grains, produced in the anther, are transferred to the stigma of same flower (self pollination) or stigma of another flower (cross pollination) through agents like air, water or animals.
- Pollen grains germinate and form pollen tubes which pass through style to reach upto the ovules present in ovary.
- The fusion of male and female gametes is called fertilization. Zygote is produced inside the ovary.
- Zygote divides to form embryo. Ovule develops thick coat and changes into seed gradually.
- Ovary changes into fruit and other parts of flower fall off.




**Germination of pollen on stigma**

- The seed germinates to form a plant under suitable conditions such as air, moisture etc.

## Reproduction in Human Beings

- Humans use sexual mode of reproduction.
- **Sexual maturation :** The period of life when production of germ cells *i.e.,* ova (female) and sperm (male) start in the body. This period of sexual maturation is called puberty.

## Changes at Puberty

**(a) Common in male and female**

- Thick hair growth in armpits and genital area.
- Skin becomes oily, may result in pimples.

**(b) In girls**

- Breast size begin to increase.
- Girls begin to menstruate.

**(c) In boys**

- Thick hair growth on face.
- Voice begin to crack.

These changes signals that sexual maturity is taking place.

## Male Reproductive System

**(a) Testes :** A pair of testes are located inside scrotum which is present outside the abdominal cavity. Scrotum has a relatively lower temperature needed for the production of sperms.

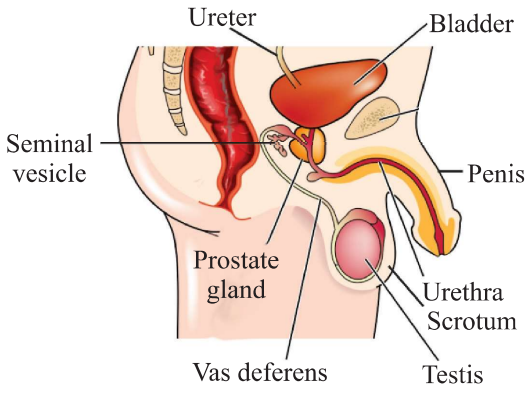
- Male germ cell *i.e.,* sperms are formed here.
- Testes release male sex hormone (testosterone). Its function is :
  (i) Regulate production of sperms.
  (ii) Bring changes at puberty.

**(b) Vas deferens :** It passes sperms from testes upto urethera.

**(c) Urethera :** It is a common passage for both sperms and urine. Its outer covering is called penis.

**(d) Associated glands :** Seminal vesicles and prostate gland add their secretion to the sperms. This fluid provide nourishment to sperms and make their transport easy.

Sperm alongwith secretion of glands form semen.




**Human – male reproductive system**

## Female Reproductive System

**(a) Ovary :** A pair of ovary is located in both sides of abdomen.

- Female germ cells *i.e.,* eggs are produced here.
- At the time of birth of a girl, thousands of immature eggs are present in the ovary.
- At the onset of puberty, some of these eggs start maturing.
- One egg is produced every month by one of the ovaries.

**(b) Oviduct or Fallopian tube**

- Receives the egg produced by the ovary and transfer it to the uterus.
- Fertilisation *i.e.,* fusion of gametes takes place here.

**(c) Uterus :** It is a bag-like structure where development of the baby takes place.

- Uterus opens into vagina through cervix.

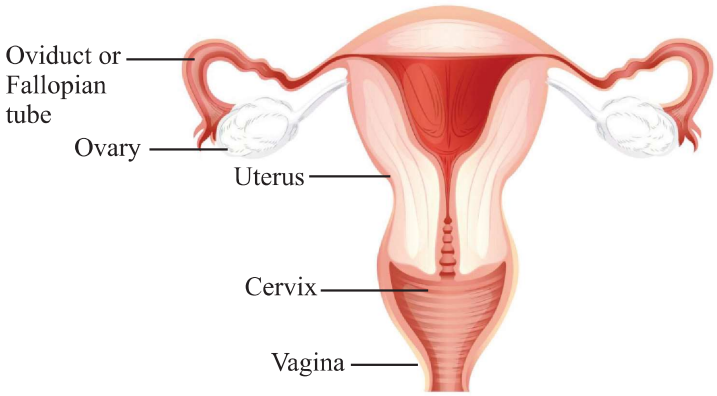



**Fig. Human – female reproductive system**

## When egg is fertilised :

- The fertilized egg called zygote is planted in uterus and develops into an embryo.
- The embryo gets nutrition from the mother's blood with the help of a special tissue called placenta. It provides a large surface area for the exchange of glucose, oxygen and waste material.
- The time period from fertilization upto the birth of the baby is called gestation period. It is about 9 months.

## When egg is not fertilised :

- The uterus prepares itself every month to receive fertilized egg.
- The lining of the uterus becomes thick and spongy, required to support the embryo.
- When fertilisation had not taken place, this lining is not needed any longer.
- This lining breaks and comes out through vagina as blood and mucus. This cycle takes around 28 days every month and called menstruation.

## Reproductive Health

Reproductive health means a total well-being in all aspects of reproduction *i.e.,* physical, emotional, social and behavioural.

## Sexually Transmitted Diseases (STDs)

- Many diseases can be sexually transmitted such as :

  **Bacterial :** Gonorrhoea and syphilis

  **Viral :** Warts and HIV-AIDS

- Use of condom prevents these infections to some extent.

## Contraception

It is the avoidance of pregnancy, can be achieved by preventing the fertilisation of ova.

## Methods of contraception

**(a) Physical barrier**

- To prevent union of egg and sperm.
- Use of condoms, cervical caps and diaphragm.

**(b) Chemical methods**

- Use of oral pills
- These change hormonal balance of body so that eggs are not released.
- May have side effects.

**(c) Intrauterine contraceptive device (IUCD)**

- Copper-T or loop is placed in uterus to prevent pregnancy.

**(d) Surgical methods**

- In males the vas deferens is blocked to prevent sperm transfer called vasectomy.
- In females, the fallopian tube is blocked to prevent egg transfer called tubectomy.

## Female Foeticide

- The practice of killing a female child inside the womb is called female foeticide.
- For a healthy society, a balanced sex ratio is needed that can be achieved by educating people to avoid malpractices like female foeticide and prenatal sex determination.
- Prenatal sex determination is a legal offence in our country so as to maintain a balanced sex ratio.

# QUESTIONS

## VERY SHORT ANSWER TYPE QUESTIONS (1 Mark)

1. Name the two types of reproduction.
2. What type of reproduction takes place in plasmodium ?
3. Define vegetative propagation.
4. Where is DNA present in a cell ?
5. Name the glands associated with male reproductive system.
6. What is menstruation ?
7. Name two contraceptive methods.
8. Where are the reproductive parts located in a plant ?

## SHORT ANSWER TYPE QUESTIONS (2 Marks)

1. Write two important functions of testosterone.
2. What is placenta ? Also write its functions.
3. Why do we see different types of organisms around us ?
4. What is the importance of variation ?
5. Why is vegetative propagation practiced for growing some types of plants ?

6. Write names of male and female sex hormones.
7. Mention the parts of a flower.
8. Differentiate between bisexual and unisexual flowers.

## SHORT ANSWER TYPE QUESTIONS (3 Marks)

1. What is tissue culture ?
2. Explain the process of fertilisation in flowering plants.
3. Name the different constituents of semen.
4. Draw a well-labelled diagram of male reproductive system.
5. What is pre-natal sex determination ? Why is it banned ?
6. Draw a labelled diagram of the longitudinal section of a flower.

## LONG ANSWER TYPE QUESTIONS (5 Marks)

1. What are the different modes of asexual reproduction ?
2. Draw a labelled diagram of female reproductive system and write the function of its different parts.
3. What is contraception ? Give different methods of contraception.
4. What happens in human female :
   (a) when egg is fertilised ?
   (b) when egg is not fertilised ?
5. Trace and explain the steps involved in the formation of seed.

## Hints to Long Answer Type Questions

1. Methods of asexual reproduction :
   (a) Fission
   (b) Fragmentation
   (c) Regeneration
   (d) Budding
   (e) Vegetative propagation
   (f) Spore formation

2. Labelled diagram of female reproductive system.

**Functions :**

**Ovary :** Production of eggs.

**Oviduct :** Site for fertilization.

**Uterus :** Place of development of embryo.

3. **Contraception :** Barrier for fertilisation.
   - Physical barrier
   - Chemical methods
   - Surgical methods
   - Intrautrine contraceptive device (IUCD)

4. (a) (i) Zygote is formed → Implanted in uterus

   (ii) Onset of pregnanacy

   (b) Menstruation

5. Labelled diagram of germination of pollen grain on stigma of flower.