🟦 Chapter 7: How Do Organisms Reproduce?

Reproduction is the biological process through which living organisms produce offspring similar to themselves. It's not essential for an individual's survival, but it ensures the continuity of a species.

—

🔷 7.1 REPRODUCTION – WHY AND HOW?

🟦 Reproduction:
The process by which organisms produce new individuals of the same species.

- It ensures the continuation of species.
- It creates variation for evolution and survival.

🟦 DNA copying:
During reproduction, organisms copy their DNA (genetic material) so that offspring inherit traits from parents.

🟦 Importance of variation:
Variations occur due to slight inaccuracies in DNA copying.
These are essential for evolution and survival in changing environments.

—

🔷 7.2 MODES OF REPRODUCTION

Organisms reproduce either asexually or sexually.

🟢 Asexual Reproduction:
Only one parent is involved. Offspring are genetically identical to the parent.

🔷 7.2.1 Fission (in unicellular organisms)

🟦 Binary fission: One organism splits into two.
E.g., Amoeba (Fig. 7.1a) — division in any plane
Leishmania (Fig. 7.1b) — division along a fixed axis

🟦 Multiple fission: The organism splits into many daughter cells.
E.g., Plasmodium (malaria parasite) (Fig. 7.2)

🧪 **Activity 7.1:** Add yeast to sugar solution. Keep warm. Observe under microscope. Buds form on yeast cells.

—

🔷 7.2.2 Fragmentation

🟦 **Definition:** The body breaks into fragments, each growing into a new organism.
E.g., Spirogyra (green filamentous algae)

🧪 **Activity 7.4:** Collect pond water, observe Spirogyra under a microscope.

—

🔷 7.2.3 Regeneration

🟦 **Definition:** Development of a new organism from body parts.
E.g., Planaria (flatworm), Hydra (Fig. 7.3)

Note: Regeneration is not the main method of reproduction in most organisms.

—

🔷 7.2.4 Budding

🟦 Definition: A new organism develops as a bud on the parent's body.
E.g., Hydra (Fig. 7.4)

—

🔷 7.2.5 Vegetative Propagation

🟦 **Definition**: New plants grow from parts like roots, stems, or leaves.

Examples:

- Potato (buds/eyes) – Activity 7.5
- Bryophyllum (leaves) – Fig. 7.5
- Sugarcane, rose, banana

🟦 **Tissue culture:**
A method of growing plants from small tissues in a nutrient medium.

🧪 **Activity 7.6:** Place money plant cuttings in water and observe root growth.

—

🔷 7.2.6 Spore Formation

🟦 **Spore Formation:** Tiny structures (spores) grow into new individuals in favourable conditions.
E.g., Rhizopus (bread mould) – Fig. 7.6

🧪 **Activity 7.2:** Observe bread kept in moist conditions for a week.

—

🟢 All above are examples of asexual reproduction.

—

🔷 7.3 SEXUAL REPRODUCTION

🟦 Definition: Reproduction involving two parents, male and female, and fusion of male and female gametes.

🔷 7.3.1 Why Sexual Reproduction?

- Combines DNA from two individuals.
- Introduces more variation in offspring.
- Gametes have half the number of chromosomes (made by meiosis).

—

🔷 7.3.2 Sexual Reproduction in Flowering Plants

🟦 **Flower** – Reproductive part of plant.

Male part: Stamen → Anther (produces pollen)
Female part: Pistil → Ovary (contains ovules)

📷 Fig. 7.7 – Flower structure
📷 Fig. 7.8 – Germination of pollen

🟦 Pollination:

- Transfer of pollen from anther to stigma.
- Can be self-pollination or cross-pollination.

🟦 Fertilization:

- Fusion of male gamete (from pollen) and female gamete (in ovule).
- Forms zygote → embryo → seed → fruit

🧪 **Activity 7.7:** Soak gram seeds, observe embryo parts during germination (Fig. 7.9)

—

🔷 7.3.3 Reproduction in Human Beings

Humans reproduce sexually. Puberty is the period when reproductive organs mature.

—

🟦 Puberty:
The stage when boys and girls become sexually mature (usually between 10–14 years).

Changes in boys:

- Facial and body hair
- Voice deepens
- Sperm production starts

Changes in girls:

- Breast development
- Menstruation begins
- Egg production starts

—

🔷 (a) Male Reproductive System (Fig. 7.10)

Main parts:

- **Testes →** Produce sperms and testosterone hormone
- **Scrotum →** Maintains lower temperature
- **Vas deferens →** Transports sperms
- **Seminal vesicles & prostate gland →** Add fluid (semen)
- **Urethra →** Passage for urine and sperms
- **Penis →** Delivers sperms into female body

—

🔷 (b) Female Reproductive System (Fig. 7.11)

Main parts:

- **Ovaries →** Produce eggs and female hormones
- **Fallopian tubes (oviduct) →** Site of fertilization
- **Uterus →** Embryo implants and develops here
- **Cervix →** Opening of uterus
- **Vagina →** Birth canal

🟦 Placenta:

Connects mother and baby, allows exchange of nutrients and waste.

—

🟦 Menstruation:

If fertilisation doesn't occur, thickened uterus lining breaks down and comes out as blood – lasts 2–7 days monthly.

—

🔷 (c) Reproductive Health

- Sexually transmitted diseases (STDs): HIV, gonorrhoea, syphilis
- **Protection:** Use of condoms and other contraceptives

🟦 Contraceptive Methods:

Method	How it works
Condom	Barrier – prevents sperm entry
Oral pills	Stops egg formation (hormonal)
Copper-T	Prevents fertilization in uterus
Surgical (vasectomy/tubectomy)	Blocks sperm/egg transport

🟦 Note: Unplanned or unsafe sex can cause diseases and unwanted pregnancies. Female foeticide and gender discrimination are social issues to be avoided.

—

✅ Summary:

- Reproduction can be asexual (1 parent) or sexual (2 parents).
- DNA copying and variation are important for survival.
- Flowering plants reproduce through pollination and fertilisation.
- Human beings reproduce sexually; puberty marks reproductive maturity.
- Reproductive health involves safe sex and avoiding infections and unplanned pregnancies.