25SCHOOLS

FREE LEARNING NOTES FOR ZAMBIA

FORM 1

Biology

Reproduction in living organisms

Lesson notes for learners · Competence-Based Curriculum

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No species lives for ever, so every kind of living thing must have a way of producing new individuals. A banana plant sends up shoots, yeast makes bread rise by budding, bacteria divide, and people and animals have young. In this note you learn the two main modes of reproduction, sexual and asexual, and the different ways asexual reproduction takes place.

AFTER THESE NOTES YOU SHOULD BE ABLE TO

- Say what reproduction is and why living things need it
- Describe sexual reproduction in simple terms
- Describe asexual reproduction by binary fission, budding, spore formation and vegetative parts
- Compare sexual and asexual reproduction
- Plan a simple investigation using vegetative parts

KEY WORDS

reproduction	the process by which living organisms produce new individuals of the same species so that their kind survives
sexual reproduction	reproduction in which two parents contribute genetic material, giving offspring with a mix of traits
asexual reproduction	reproduction in which a single parent produces offspring without gametes
fertilisation	the process by which a male gamete fuses with a female gamete to form a zygote
binary fission	asexual reproduction in which an organism divides into two identical new individuals
budding	asexual reproduction in which a new organism grows from a bud on the parent
spore	a special reproductive cell that can grow into a new individual under the right conditions

1 Why living things reproduce

Reproduction is the biological process by which living organisms produce new individuals of the same species. This ensures the survival and continuity of the species, because no species lives for ever.

2 Sexual reproduction

In sexual reproduction two parents contribute genetic material, so the offspring have a mix of traits from both of them. A male gamete fuses with a female gamete in a process called fertilisation, and the cell formed is a zygote.

In humans, puberty is the stage of physical and emotional development that marks the change from childhood to adulthood. Ovulation is the release of a mature egg cell from the ovary into the fallopian tube, where it can be fertilised by a sperm. Menstruation is the natural process in which the uterus sheds its lining, resulting in bleeding.

3 Asexual reproduction

In asexual reproduction a single parent produces offspring without gametes. The offspring are exact copies of the parent, often called clones. There are several ways it happens.

In binary fission an organism divides into two identical new individuals; it is common in bacteria. In budding a new organism grows from an outgrowth of the parent, as in yeast. In spore formation an organism makes spores, which grow into new individuals when conditions are right, as in fungi. Plants can also reproduce from vegetative parts such as tubers, cuttings, buds, leaves, suckers, bulbs, corms, rhizomes and runners.

Feature	Sexual reproduction	Asexual reproduction
Number of parents	Two	One
Gametes	Male and female gametes fuse	No gametes
Offspring	A mix of traits from both parents	Identical to the parent (clones)
Examples	Humans and flowering plants using seeds	Bacteria, yeast, fungi and plants from suckers, bulbs or cuttings

Figure 1. Sexual and asexual reproduction compared

4 Investigating reproduction

To investigate asexual reproduction in plants, prepare vegetative parts that are easy to find, such as cuttings, suckers or tubers, and plant them in a tray of moist soil. Water gently but thoroughly, place the tray in a warm, bright place that is not in direct sunlight, keep the soil moist and observe it every day. To investigate spores, look at a fungus or a video of one and find which structure makes the spores and under what conditions they grow.

TRY THIS

In groups of four or five, plant three different vegetative parts, for example a cutting, a sucker and a tuber, in a tray of moist soil. Water gently, keep the tray in a warm, bright place and record what you see each day. After a week, say which parts started to grow and what that shows about asexual reproduction.

REMEMBER

- Reproduction produces new individuals so that a species survives
- Sexual reproduction uses two parents and gametes, and offspring have a mix of traits
- Asexual reproduction uses one parent and no gametes, and offspring are clones
- Binary fission, budding, spore formation and vegetative parts are ways of reproducing asexually
- Fertilisation is the fusion of a male gamete with a female gamete to form a zygote

? Check yourself

1. What is reproduction?
2. How many parents are needed for asexual reproduction?
3. What is fertilisation?
4. Name three vegetative parts that plants can reproduce from.
5. Name the type of asexual reproduction that is common in bacteria.
6. A farmer near Feira notices new banana shoots coming up beside her old banana plant. (a) Is this sexual or asexual reproduction? (b) What name is given to these shoots? (c) Explain how the new plants compare with the parent.
7. A group of learners plants cuttings in a tray of moist soil. (a) Where should they put the tray? (b) How should they care for it? (c) Say how this shows asexual reproduction and compare it with growing a plant from a seed.

ANSWERS

1. The process by which living organisms produce new individuals of the same species.
2. One.
3. The fusion of a male gamete with a female gamete to form a zygote.
4. Any three of tubers, cuttings, buds, leaves, suckers, bulbs, corms, rhizomes and runners.
5. Binary fission.
6. (a) Asexual reproduction. (b) Suckers. (c) They are exact copies of the parent because only one parent is involved and no gametes are used.
7. (a) In a warm, bright place that is not in direct sunlight. (b) Water gently but thoroughly, keep the soil moist and observe it daily. (c) The new plant grows from a vegetative part of one parent without gametes, so it is identical to the parent; a plant grown from a seed comes from the fusion of ga

Written by 25Schools to follow the Form 1 Biology syllabus of the Zambian competence-based curriculum. Free for learners to read, download and share. More notes and quizzes at 25schools.com.