TeachThemAll

TUV-6E84FB54

SCIENCE · YEAR 8 KS3

TOPIC NOTES

▪ 2026-06-28

All life cycles include stages of growth and reproduction — Science

01 · Explanation

Every living organism has a **life cycle**. A life cycle is the sequence of stages in the life of an organism, from the beginning of one individual life to the point where new individuals of the same species are produced, and eventually to death. Different species have different life cycles, but they all include the ideas of **growth** and **reproduction**.

Growth means becoming larger or increasing in mass. **Development** means the changes in body structure and function that happen as an organism becomes more mature. These two ideas are connected. An organism does not only get bigger; it also changes so that it can survive, function and, later, reproduce. For example, a human child grows taller, but also develops organs, bones, muscles and a reproductive system that becomes mature later in life.

reproduction, biological information is passed from parent to offspring, which is why offspring belong to the same species and share characteristics with their parent or parents.

In many multicellular organisms, growth and development lead to **maturity**, which is the stage when the organism is able to reproduce. In humans, this happens after **puberty**, when the body becomes sexually mature. The human life cycle includes early development before birth, then babyhood, childhood, adolescence and adulthood. Adulthood is the stage at which reproduction can occur, allowing the life cycle to continue into a new generation. Not every individual survives long enough to reproduce, but the human life cycle as a pattern for the species includes a reproductive stage.

The same basic idea appears in many different organisms:

- In humans, a fertilised egg develops before birth, then the baby grows into a child, then an adolescent, and later an adult. The adult stage includes reproduction, producing new babies who begin the cycle again.
- In frogs, eggs hatch into tadpoles. Tadpoles grow and develop into adult frogs, changing body form as they do so. Adult frogs reproduce by producing new eggs, so reproduction happens after growth and development.
- In flowering plants, a seed germinates into a seedling. The seedling grows into a mature plant. The mature plant produces flowers, and after pollination and fertilisation it forms seeds. Those seeds can grow into new plants, starting the cycle again.

Some organisms show gradual development, as humans do. Others go through **metamorphosis**, which is a major change in body form during the life cycle, as in frogs or butterflies. Even when the stages look very different, the pattern is still the same: a new organism begins life, grows and develops, reaches the stage where it can reproduce, and reproduction produces the next generation.

parent and occurs in some organisms. In both cases, the role of reproduction is the same: to produce new individuals and continue the life cycle.

A good way to understand any life cycle is to look at how the stages are connected. Early stages focus mainly on survival, growth and development. Later stages allow reproduction. Reproduction is not separate from the life cycle; it is the stage that makes the next life cycle possible.

LIFE CYCLES

VISUAL STUDY SHEET

1 WHAT IS A LIFE CYCLE?

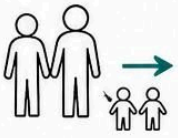
- Sequence of stages in the life of an organism.
- From the beginning of one individual life to the point where new individuals of the same species are produced, and eventually to death.
- All life cycles include two key ideas:

GROWTH
becoming larger or increasing in mass

DEVELOPMENT
changes in body structure and function as the organism matures

Growth and development are connected: organisms get bigger **AND** change so they can survive, function and later reproduce.

2 REPRODUCTION: THE KEY STAGE



- ✓ Process by which organisms produce **OFFSPRING.**
- ✓ Essential: individuals do not live for ever; without it, the species would disappear.
- ✓ Passes biological information from parent to offspring.
- ✓ Offspring belong to the same species and share characteristics with their parent or parents.

Reproduction links one generation to the next and **CONTINUES the LIFE CYCLE.**

3 FROM GROWTH TO MATURITY

EARLY DEVELOPMENT (before birth) — BABYHOOD → CHILDHOOD → ADOLESCENCE — ADULTHOOD (reproduction)

- In many multicellular organisms, growth and development lead to **MATURITY** (able to reproduce).
- In humans, this happens after **PUBERTY** (sexually mature).
- Adulthood allows reproduction, producing new babies who begin the cycle again.
- Not every individual survives long enough to reproduce, but the human life cycle as a pattern for the species includes a reproductive stage.

4 THE SAME BASIC IDEA IN MANY ORGANISMS

HUMANS

Fertilised egg develops before birth → Baby grows into a child → Child grows into an adolescent → Adult stage includes reproduction → New babies begin the cycle again

FROGS

Eggs → Hatch into tadpoles → Tadpoles grow and develop → Adult frogs (reproduction) → Produce new eggs

Reproduction happens AFTER growth and development.

FLOWERING PLANTS

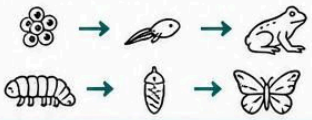
Seed → Germinates into a seedling → Grows into a mature plant → Produces flowers → Pollination and fertilisation form seeds → Seeds can grow into new plants

Different organisms, same pattern: a new organism begins life, grows and develops, reaches the stage where it can reproduce, and reproduction produces the next generation.

5 DIFFERENT WAYS, SAME PURPOSE

Some organisms show **GRADUAL DEVELOPMENT** (as humans do).

Others go through **METAMORPHOSIS** (major change in body form).



Even when the stages look very different, the pattern is still the same: begin life → grow & develop → reproduce → next generation.

6 TYPES OF REPRODUCTION

SEXUAL REPRODUCTION	ASEXUAL REPRODUCTION
• Involves genetic information from two parents. • Found in humans and many other animals and plants.	• Involves one parent. • Occurs in some organisms.

In both cases, the role of reproduction is the same: **TO PRODUCE NEW INDIVIDUALS** and **CONTINUE** the **LIFE CYCLE.**

7 HOW TO UNDERSTAND ANY LIFE CYCLE

EARLY STAGES Focus on **SURVIVAL, GROWTH** and **DEVELOPMENT.** → **LATER STAGES** Allow **REPRODUCTION.** → **REPRODUCTION** is **NOT** separate from the life cycle; it is the stage that **MAKES** the **NEXT LIFE CYCLE POSSIBLE.**