



SCIENCE · KS3 · YEAR 8

DIDACTIC PACK

▪ Teacher ▪ 28/06/2026 ▪ 50 min ▪ Project-Based Learning ▪ 28/06/2026

All life cycles include stages of growth and reproduction.

OBJECTIVE

Students will identify that all life cycles include stages of growth and reproduction, using human and bean plant life cycles as examples. They will describe the main stages in each cycle, compare similarities and differences, and apply the idea to a new organism to show that life cycles are shared patterns across living things.

CONCEPTS

BLOCK	CONCEPT	TYPE
Reproduction in humans	All life cycles include stages of growth and reproduction.	introduce

teachthemall.com/pack/TUV-09E8CAFF

PEDAGOGICAL APPROACH**Project-Based Learning**

ABP Gold Standard: driving question → sustained inquiry → milestones with feedback → public product (Project-Based Learning)

5%	10%	20%	25%	20%	20%
Remember		Understand	Apply	Analyze	Evaluate
					Create

GROUPING: Small Group

TEACHER ROLE: Facilitator

ASSESSMENT: Formative

REFERENCE SOURCES

- Hattie 2009 $d=0.58$ (Problem-Based Learning)
- Krajcik & Shin 2014
- Larmer et al. 2015 (BIE Gold Standard)

TEACHER GUIDE

- ☐ For teacher use only — do not share with students.

01

START 6 min

Start — activation and hook

TEACHER
DOES

Open the session with the activation hook and connect the new topic to what the students already know. Then pose these retrieval questions: What does growth mean in a living organism? / What does reproduction mean in biology? / What is an offspring?

STUDENTS
DO

They answer the activation questions and connect the topic to what they already know.

CONTENT
WORKS

Activation of prior knowledge on All life cycles include stages of growth and reproduction — Science

From warm-up discussion to teacher explanation: record a quick verbal response, then turn to the key definitions.

02

MAIN 15 min

Development — concept explanation

TEACHER
DOES

Explain and model Human and bean plant life cycles, drawing on the visual representation and highlighting the key vocabulary.

STUDENTS
DO

They follow the explanation, note the key vocabulary and observe the visual representation.

CONTENT
WORKS

Concept explanation: Human and bean plant life cycles

From explanation to guided practice: complete the first organiser with the teacher before pair work begins.

03

MAIN 14 min

Development — guided practice

TEACHER DOES

Organise the practice in whole class -> pairs -> individual and circulate giving feedback towards the intended product.

STUDENTS DO

With the teacher, copy and complete this organiser for the human life cycle. Organism | stages in order | parts showing growth | reproductive stage | reason Human | embryo, baby, child, adult |. |. |. Use this sentence frame: "The parts showing growth are. The reproductive stage is because _." Check for understanding: before moving on, write one answer on your mini-whiteboard. Prompt: "The adult stage is the reproductive stage in this model because _." In pairs, complete the second row for the bean plant life cycle using seed, seedling, young plant, flowering plant. Use this sentence frame: "Growth happens from to.

CONTENT WORKS

Guided practice on All life cycles include stages of growth and reproduction — Science

From guided practice to independent practice: check the mini-whiteboard answer, then release students to solo work.

04

MAIN 8 min

Development — independent transfer

TEACHER
DOES

Present the new application context and supervise the students' independent transfer.

STUDENTS
DO

Independent practice New context: frog life cycle Use this sequence: egg, tadpole, young frog, adult frog. Identify which parts show growth. State the stage at which reproduction can occur. Write two sentences comparing the frog life cycle with either the human or the bean plant life cycle. Changing conditions A bean plant grows roots, stem and leaves but never produces flowers or seeds. Has growth happened? Explain. Has reproduction happened? Explain. What would this mean for continuation of the species if no plants reproduced? Quick judgement Decide whether each statement is correct or incorrect, and rewrite any incorrect statement so it becomes accurate.

CONTENT
WORKS

Transfer of All life cycles include stages of growth and reproduction — Science to a new application context

From independent practice to closure: stop writing, self-check the comparison, and prepare one oral summary.

05

CLOSE 7 min

Close — synthesis and formative assessment

TEACHER
DOES

Lead the whole-class discussion and gather evidence of learning from the planned synthesis task.

STUDENTS
DO

Complete these sentence frames in your notebook, then say them to a partner: "A life cycle is..." "To decide whether a stage shows growth or reproduction, I ask..." "The step I must not forget is. because..." Use either the human or the bean plant example in your answer.

CONTENT
WORKS

Synthesis and formative assessment of All life cycles include stages of growth and reproduction — Science

Close of the session.

TEACHER REFLECTION

Check whether students could clearly link growth and reproduction to both human and plant life cycles, and whether they could transfer the idea to a new example. Note any misconceptions, especially if they think reproduction happens only in animals or only in flowering plants.

MATERIALS GENERATED

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- Supporting content generated for this session.

1. **LEARNING SITUATION** — All life cycles include stages of growth and reproduction — Science
2. **STUDY NOTES** — All life cycles include stages of growth and reproduction — Science

All life cycles include stages of growth and reproduction — Science

Objective

By the end of the lesson, you can complete a comparison of a human and a bean plant life cycle, identify which stages show growth and which stage shows reproduction, and justify why reproduction is needed for continuation of a species.

Hook

Prior knowledge activation

- You already know that living things grow and that living organisms produce offspring.
- Today you will connect those two ideas inside the idea of a life cycle.

Why this matters today

- A human changes from embryo to baby to child to adult.
- A bean plant changes from seed to seedling to young plant to flowering plant.
- These organisms look very different, but both life cycles include growth and a stage that can produce the next generation.
- Question to think about: if an organism grows well but never produces offspring, what part of the life cycle is missing?
- What does growth mean in a living organism?
- What does reproduction mean in biology?
- What is an offspring?

Representation

1. WHAT A LIFE CYCLE IS

A life cycle is the sequence of stages a living organism passes through from the beginning of an individual life to the production of the next generation.

- **Growth** means the organism becomes larger and/or more developed.
- **Reproduction** means the organism produces offspring.
- Different organisms have different stages, but every life cycle includes growth and a reproductive stage.

2. HUMAN EXAMPLE

Use these stages in order: embryo, baby, child, adult.

- From embryo to adult, the human becomes more developed. That is growth.
- In the adult stage, reproduction can occur and begin a new human life cycle.
- Important: not every individual adult reproduces, but the human life cycle includes a stage where reproduction can happen.

3. BEAN PLANT EXAMPLE

Use these stages in order: seed, seedling, young plant, flowering plant.

- From seed to flowering plant, the plant grows and becomes more developed.
- When the flowering plant produces new seeds, that is reproduction because new offspring can develop from those seeds.

4. WORKED EXAMPLE

Question: In the bean plant sequence seed, seedling, young plant, flowering plant, new seeds, which parts are growth and which part is reproduction?

1. First I list the stages in order, because a life cycle is a sequence.
2. Next I ask, "Where does the organism become larger or more developed?"
Seed to seedling to young plant to flowering plant is growth.
3. Then I ask, "Where are new offspring produced?" The flowering plant producing new seeds is reproduction.
4. So my answer is: growth happens from seed to flowering plant;
reproduction happens when the flowering plant produces new seeds.

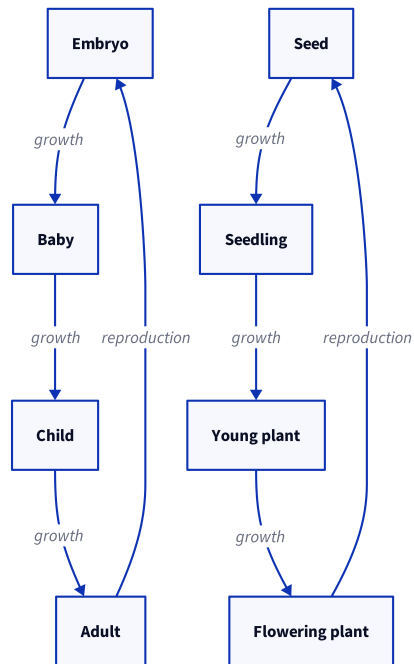
CHECK FOR UNDERSTANDING

Write one short answer before moving on.

- In the human sequence embryo, baby, child, adult, which changes show growth?
- At which stage can reproduction occur? Sentence frame: "Growth happens from ___ to _____. Reproduction can occur at the _____ stage."

5. WHAT STAYS THE SAME AND WHAT CHANGES

- In both examples, the life cycle includes growth and a reproductive stage.
- The stage names and body forms are different.
- The role of reproduction is the same in both cases: it produces offspring and allows the species to continue.

**FIGURE 1** · Human and bean plant life cycles

Term	Definition
life cycle	the sequence of stages an organism passes through from the start of life to the production of the next generation
growth	becoming larger and/or more developed
reproduction	the process by which an organism produces offspring
offspring	a new organism produced by parent organism(s)
adult	the mature stage of an organism

Guided practice

1. With the teacher, copy and complete this organiser for the human life cycle.
Organism | stages in order | parts showing growth | reproductive stage |
reason Human | embryo, baby, child, adult | ... | ... | ... Use this sentence
frame: "The parts showing growth are _____. The reproductive stage is _____
because _____."
2. Check for understanding: before moving on, write one answer on your mini-
whiteboard. Prompt: "The adult stage is the reproductive stage in this
model because _____."
3. In pairs, complete the second row for the bean plant life cycle using seed,
seedling, young plant, flowering plant. Use this sentence frame: "Growth
happens from _____ to _____. Reproduction happens when _____."
4. Work on your own for the final two questions. a) Write one similarity
between the human and bean plant life cycles. b) Write one difference
between them. c) Decide whether this statement is correct or incorrect:
"Growth and reproduction are the same process." Justify your answer.
5. Final check for understanding: hold up your answer to part 4c before you
continue. If your reason does not mention offspring or new seeds, revise it.

Grouping: whole class -> pairs -> individual *Deliverable:* A completed
comparison organiser for human and bean plant life cycles, with the stages,
the identified growth and reproductive parts, and written justifications.

Independent transfer

Independent practice

1. New context: frog life cycle Use this sequence: egg, tadpole, young frog,
adult frog.
 - Identify which parts show growth.

- State the stage at which reproduction can occur.
- Write two sentences comparing the frog life cycle with either the human or the bean plant life cycle.

2. Changing conditions A bean plant grows roots, stem and leaves but never produces flowers or seeds.

- Has growth happened? Explain.
- Has reproduction happened? Explain.
- What would this mean for continuation of the species if no plants reproduced?

3. Quick judgement Decide whether each statement is correct or incorrect, and rewrite any incorrect statement so it becomes accurate.

- "Reproduction means getting bigger."
- "Different organisms can have different stages but still share growth and reproduction."

Deliverable Hand in your annotated frog sequence and your written answers, with at least one comparison and a clear reason for each explanation.

New context: Applying the same method to a frog life cycle, then analysing a plant that grows without reproducing.

Closure

Complete these sentence frames in your notebook, then say them to a partner:

- "A life cycle is ..."
- "To decide whether a stage shows growth or reproduction, I ask ..."
- "The step I must not forget is ... because ..." Use either the human or the bean plant example in your answer.

Formative assessment

Exit question: 1) In this sequence, egg → tadpole → young frog → adult frog, identify which stages show growth and which stage shows reproduction. 2) A bean plant grows roots, stem and leaves but never produces flowers or seeds. Explain whether growth and reproduction have both happened.

Success criterion:

Success criterion	Beginning	Developing	Secure
Accuracy of stage classification	Names stages but mislabels growth or reproduction.	Identifies most stages correctly with one error.	Classifies growth and reproduction correctly in both examples.
Use of biological reasoning	Gives a vague reason without referring to offspring.	Refers to offspring or seeds but explanation is incomplete.	Explains reproduction as producing offspring or new seeds clearly.
Comparison and transfer	Answers only the familiar example.	Makes a partial comparison to the new case.	Transfers the idea to the frog or plant case and compares accurately.

Written clarity	Response is difficult to follow.	Some correct ideas are written, but sequencing is unclear.	Response is organised and easy to mark quickly.
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Differentiation

Support: If you need support, redo the first step from the worked example yourself: list the stages, then ask whether the organism becomes larger or more developed, then ask whether offspring are produced. Check each answer against the growth/reproduction definitions before moving on.

If writing is hard, show your thinking orally to a partner or the teacher, or complete the comparison organiser with short labels and arrows instead of full sentences.

Extension: If you finish early, tackle the frog transfer task and explain why the bean plant can grow without reproducing. Then add a stronger justification: what would happen to the species if no adult ever reached a reproductive stage?

Language support: Use the glossary terms as you speak and write: life cycle, growth, reproduction, offspring, adult. Say each step aloud in order: stage, change, reason. For writing, use the sentence frames and keep your wording simple but precise.

All life cycles include stages of growth and reproduction — Science

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 is the process by which organisms produce **offspring**. This is essential because individual organisms do not live for ever. If reproduction did not happen, the species would eventually disappear. Reproduction is therefore a key stage in the life cycle because it links one generation to the next. In 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.

Reproduction does not always happen in the same way. **Sexual reproduction** involves genetic information from two parents and is the type found in humans and many other animals and plants. **Asexual reproduction** involves one 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 grow into new plants Seeds can form 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**.

AI-assisted content. Teacher review, adaptation and validation required before classroom use.

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