

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

2 / 2

- 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