Inside a flower

60 minutes • D3.1.8 and D3.1.9 • Chapters 1, 2

The parts of an insect-pollinated flower and what each does, and how pollination, the pollen tube and fertilization make an embryo

BY THE END, STUDENTS CAN

- [ ] Explain sexual reproduction in flowering plants: gametes in pollen and ovules, pollination, the pollen tube, fertilization and the embryo, and why it is sexual even in a hermaphrodite flower D3.1.8
- [ ] Draw and annotate an insect-pollinated flower, naming each structure and its function D3.1.9

TIMING

0–6	6 min	**Do now: a flower from memory**	
6–18	12 min	**Take it apart**	
18–40	22 min	**Flower dissection on card**	
40–52	12 min	**From pollen to embryo**	
52–60	8 min	**Exit**	
	60 min	**One lesson**	

STARTER

6 min

Do now: a flower from memory

Sketch a flower from memory and label every part you can. Keep the sketch: the exit task redraws it.

ON THE BOARD, FROM THE GUIDE

Open the guide on the projector at each chapter (the links work in this PDF). Every figure plays from its own buttons, and the lesson's slides have the same figures, step by step, in the order of this plan.

01 A flower, part by part

CHAPTER 01 IN THE SLIDES

Step through the figure (2 steps, the arrow keys on a projector). Stop on each caption and ask what changed before you go on.

1. Cut lengthways, a half-flower shows every part at once. A stamen is an anther on a filament; the carpel is the stigma, the style and the ovary, with the ovules inside it.
2. The drawing to learn: each part named on a ruled line, with what it does. Pollen is made in the anthers; the egg cell is in an ovule, inside the ovary.

> **Predict box:** A flower's petals are removed before it opens. What does the plant lose? Hands up or mini whiteboards first.
>
> **Answer C: The signal that brings insects in, so fewer of them visit with pollen**

> **Remember it:** Sweet Peas Smell Clean (Sepals, Petals, Stamens, Carpel).

02 From pollen to embryo

CHAPTER 02 IN THE SLIDES

Tap the parts of the figure in turn: Anther, Style, Ovule, Stigma, Anther, Ovule, Anther, Pollen grains, Pollen grains, Tube nucleus, Two male gametes, Ovule wall, Central cell, Egg cell, Micropyle, Anther, Style, Ovule, Stigma, Anther, Ovule, Anther, Pollen grains, Pollen grains, Tube nucleus, Two male gametes, Ovule wall, Central cell, Egg cell and Micropyle.

Play the animation, From pollen to embryo. It loops; pause it on each moment below and ask what is happening (in the lesson slides it is a video).

1. A **pollen grain** is not a gamete. It carries two **male gametes** inside it.
2. Over hours, each tube grows down through the **style** to an **ovule**.
3. One male gamete fuses with the **egg cell**: **fertilization**. The new cell is a **zygote**.
4. Over weeks the ovule grows into a **seed** and the ovary into a **fruit**. The petals wither and fall.

> **Predict box:** A flower is fertilized by pollen from its own anthers. Is the seed the product of sexual reproduction? Hands up or mini whiteboards first.
>
> **Answer B: Yes: gametes from cells made by meiosis still fuse, as in a cross**

THE LESSON

12 min

Take it apart

Open on the petals predict box, then take the flower apart on the projector with chapter 1, a ring at a time from the sepals in, and name the parts of the half-flower. Sweet Peas Smell Clean goes on the board. The tool's Annotate step is left for the card in the next activity.

22 min

Flower dissection on card

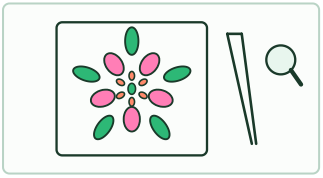
Flower dissection on card (below), in pairs: sepals, petals and stamens stuck down a ring at a time, the carpel in the middle, every part labelled with its job. If there is time, cut a second carpel lengthways to find the ovules.

12 min

From pollen to embryo

Chapter 2's drawing: tap the anther, a pollen grain, the ovule and the egg cell, and ask which of them is a gamete. Take the self-pollination predict box, then play the pollination film, from a grain on the stigma to a seed in its fruit.

ACTIVITIES



PRACTICAL

Flower dissection on card

Take a large flower apart from the outside in, as chapter 1's tool does. Stick the sepals down in an outer ring with clear tape, then the petals inside them, then the stamens, with the carpel in the middle. Label each part and write its job beside it, then photograph the card as a record. Cut a second carpel lengthways with a sharp blade to show the ovules in the ovary.

Needs: large, simple flowers (wallflowers and geraniums have sepals and petals that differ; in lilies and tulips the sepals look just like the petals, so stick the outer ring and the inner ring down separately; check for pollen allergies first, and keep lily pollen off clothes, where it stains), tweezers, card, clear tape, hand lenses, a sharp blade for the carpels. Cut on a tile, away from your fingers, with the blade moving away from the hand that holds the flower; the teacher can do the carpel cut as a demonstration. Wash hands afterwards, and do not taste any part of the plants.

PLENARY

8 min

Exit

Redraw the Do now flower as a half-flower: outlines only, ruled label lines, and each part's job beside its name. Then two sentences: what pollination does, and what fertilization makes. Set the gallery photographs as homework for the next lesson (or print a set of your own).

WHAT STUDENTS GET WRONG

"Pollen is the male gamete." A pollen grain carries the male gametes inside its wall.

"Pollination is fertilization." Pollination only moves pollen to a stigma. Fertilization, the fusion of the gametes inside the ovule, comes later, if at all.

"The stamen is the anther." The stamen is the anther and its filament. The carpel is the stigma, style and ovary together.

"Fertilization makes the seed." It makes a zygote, which grows into the embryo; the whole ovule becomes the seed.

STRETCH AND SUPPORT

Support: chapter 1's labelled half-flower to copy, with each part's job on a separate card to place beside it.

Stretch: why does a flowering plant need a pollen tube at all? (The egg cell is deep inside the ovule, in the ovary, and the male gametes cannot swim.)

IN THE GUIDE

1 A flower, part by part

2 From pollen to embryo

All The whole guide, with the figures that play

PPTX This lesson's slides, in the order of this plan

EXAM PRACTICE

Check yourself

Set it for homework: a fresh paper of exam-bank questions on D3.1 at standard level each time, marked as students go and saved to their Exam practice when they are signed in.

biologybybradford.com/exam-maker/sit?topics=D3.1&level=SL&paper=quiz&marks=15&src=ep

PRACTISE AND REVISE

BUILD FOR YOUR CLASS

- Tarsia puzzle, dominoes and picture reveal on D3.1, built from its key terms and ready to print
- A pub quiz with rounds on D3.1, to present or run with no projector
- An escape room built from the question bank on D3.1

ALREADY ON THE SITE FOR D3.1

- Quiz: Menstrual Cycle Hormones
- Quiz: Reproduction
- Revision map: D3.1 Reproduction, to fill in
- Exam questions: D3.1 in the exam maker, a paper with its markscheme

CARD SETS ON SPLYCR

Open a set to host it as a class game, or make a copy to edit.

- D3.1 Reproduction (SL)
- D3.1 Reproduction (HL)

How this was made. The course structure, the activities and the teaching choices come from my own classroom, my presentations and my years of teaching IB and AP Biology. I use Claude, an AI, to help write and build the interactive guides, lesson plans, slides and practice questions, and to draw the diagrams and code the interactives. I direct the work and review it against the IB and AP specifications before it goes live.