CHAPTER 3

Plant Kingdom

CBSE · Biology · Class 11

WHAT THIS CHAPTER DOES

Boards prep that builds confidence, not anxiety.

TODAY'S MISSION

Today's mission

WHY THIS MATTERS

The big picture — a ladder of rising complexity

TOPIC

The five groups at a glance

TOPIC

The plant-group ladder (the spine of this chapter)

TOPIC

A

Part A — Algae

TOPIC

Algae — simple aquatic autotrophs

POINT 1	POINT 2	POINT 3	POINT 4

TOPIC

The three classes of algae (THE 5-mark table)

TRY IT · SOLVE BEFORE YOU PEEK

Quick test — Algae

Work it out before you flip the answer.

SOLUTION

TOPIC

B

Part B — Bryophytes & Pteridophytes

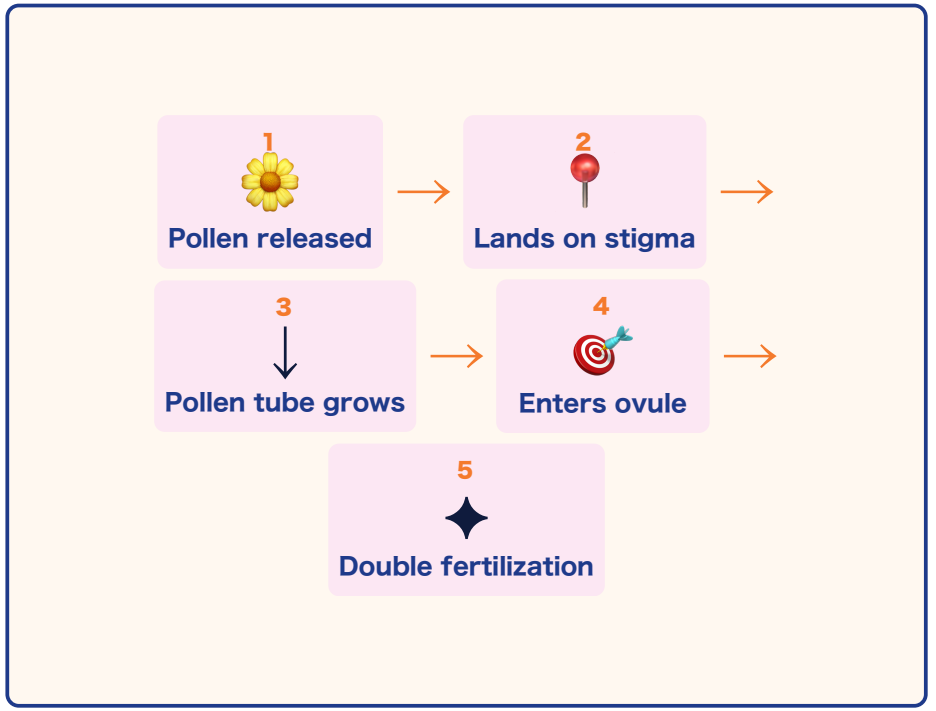
TOPIC

Bryophytes & Pteridophytes — onto land

POINT 1	POINT 2	POINT 3	POINT 4

WORKED EXAMPLE

Alternation of generations — the universal plant life cycle



TOPIC

Three life-cycle patterns

TRY IT · SOLVE BEFORE YOU PEEK

Quick test — life cycles & bryophytes

Work it out before you flip the answer.

SOLUTION

TOPIC

C

Part C — Gymnosperms & Angiosperms

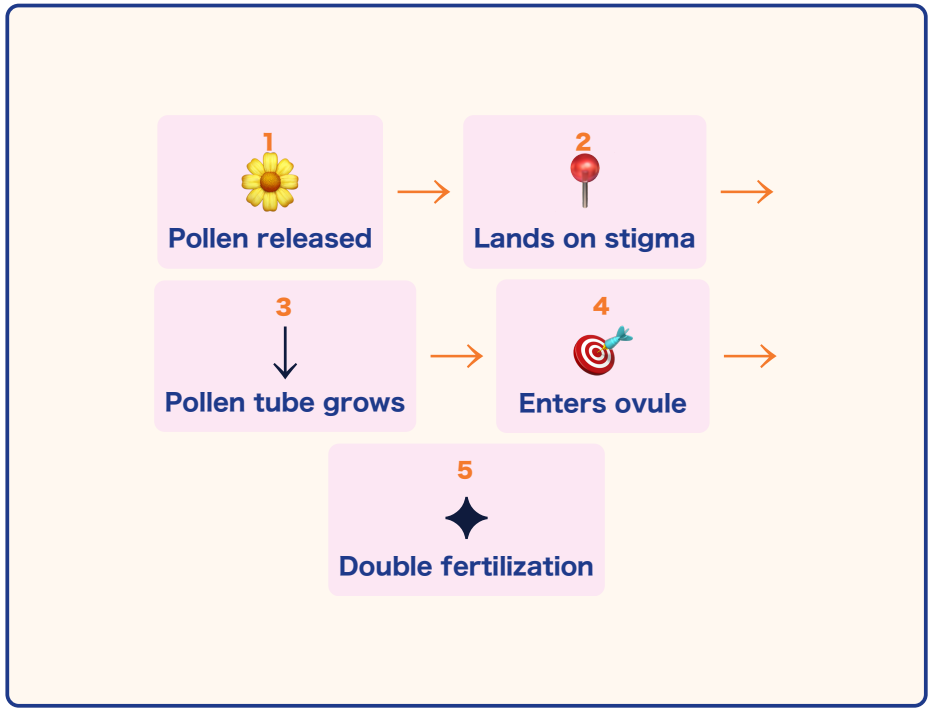
TOPIC

Seed plants — gymnosperms and angiosperms

POINT 1	POINT 2	POINT 3	POINT 4

WORKED EXAMPLE

Classify an unknown seed plant — a step-by-step key



TRY IT · SOLVE BEFORE YOU PEEK

Pause — seed-plant recall

Work it out before you flip the answer.

SOLUTION

TOPPER TEMPLATE · MARK-BY-MARK

Topper-grade 5-mark answer — the three-algal-class table

PYQ PATTERNS

PYQ pattern map — what CBSE has actually asked

MARKS DISTRIBUTION

Sub-topic marks weight (last 5 years)

TOPIC

Trap

TRAP → TRUTH

× **MISTAKE** All algae are green because they all photosynthesise.

✓ **CORRECT** Algae come in three colour classes set by their DOMINANT pigment: Chlorophyceae (green, chlorophyll a + b), Phaeophyceae (brown, fucoxanthin), Rhodophyceae (red, r-phycoerythrin). All contain chlorophyll, but accessory pigments mask the green and decide the colour.

TOPIC

Trap

TRAP → TRUTH

× **MISTAKE** Bryophytes are fully terrestrial plants like grasses.

✓ **CORRECT** Bryophytes are called 'amphibians of the plant kingdom' because, although they live on land, they REQUIRE water for sexual reproduction — the motile antherozoids must swim to the egg. They also lack true roots, stems and leaves (only rhizoids, and a thalloid or leafy body).

TOPIC

Trap

TRAP → TRUTH

× **MISTAKE** The leafy green moss plant is the sporophyte.

✓ **CORRECT** In bryophytes the dominant, photosynthetic, leafy/thalloid body is the GAMETOPHYTE (n). The sporophyte (2n) is small, short-lived and NUTRITIONALLY DEPENDENT on the gametophyte — it is a capsule on a stalk. Bryophytes are gametophyte-dominant; pteridophytes onwards the sporophyte dominates.

TOPIC

Trap

TRAP → TRUTH

× **MISTAKE** Pteridophytes (ferns) produce seeds.

✓ **CORRECT** Pteridophytes are the FIRST true vascular plants (have xylem and phloem) but they do NOT produce seeds — they reproduce by SPORES borne in sporangia (often on the underside of fronds in sori). Seeds first appear in gymnosperms.

TOPIC

Trap

TRAP → TRUTH

× **MISTAKE** Gymnosperm seeds are 'naked' because they have no seed coat.

✓ **CORRECT** 'Naked seed' means the ovules (and hence the seeds) are NOT enclosed inside an ovary / fruit — they sit exposed on the surface of megasporophylls (e.g. on cone scales). The seed itself still has a coat. There is simply no fruit wall around it.

TOPIC

Trap

TRAP → TRUTH

× **MISTAKE** Double fertilisation occurs in all seed plants.

✓ **CORRECT** DOUBLE fertilisation (one sperm fuses with egg → zygote; the other fuses with two polar nuclei → triploid endosperm) is UNIQUE to ANGIOSPERMS. Gymnosperms show only single fertilisation and have no triple-fusion endosperm.

TOPIC

Trap

TRAP → TRUTH

× **MISTAKE** Monocots and dicots differ only in the number of cotyledons.

✓ **CORRECT** Cotyledon number is one of FIVE linked differences: monocots have 1 cotyledon, parallel venation, fibrous roots, trimerous flowers, and scattered vascular bundles; dicots have 2 cotyledons, reticulate venation, taproots, tetra/pentamerous flowers, and a ring of vascular bundles.

TOPIC

Trap

TRAP → TRUTH

× **MISTAKE** Red algae live only in cold shallow water.

✓ **CORRECT** Rhodophyceae (red algae) are mostly MARINE and many grow at GREATER DEPTHS than other algae, because r-phycoerythrin absorbs the blue-green light that penetrates deep water. Examples: Polysiphonia, Porphyra, Gracilaria, Gelidium (source of agar).

PYQ PATTERNS

Top PYQ patterns to drill

#1	Compare the three classes of algae (Chlorophyceae / Phaeophyceae / Rhodophyceae) on pigments, stored food and cell-wall, with examples. (5 marks)	90%
#2	Explain alternation of generations / distinguish haplontic, diplontic and haplo-diplontic life cycles with an example each. (3 marks)	70%
#3	Why are bryophytes called 'amphibians of the plant kingdom'? (2 marks)	75%
#4	Differentiate gymnosperms and angiosperms (seeds, ovary, fertilisation, examples). (3 marks)	65%
#5	Distinguish monocotyledons and dicotyledons (cotyledons, venation, root, floral parts). (2 marks)	55%

RECAP · MEMORISE THESE

Chapter summary — the 7 things you MUST carry away

1 Plant ladder of rising complexity: Algae → Bryophytes → Pteridophytes → Gymnosperms → Angiosperms.

2 Algae = three classes by pigment: Chlorophyceae (green, starch) / Phaeophyceae (brown, mannitol) / Rhodophyceae (red, floridean starch).

3 Bryophytes = 'amphibians'; gametophyte dominant; need water for fertilisation; only rhizoids, no vascular tissue.

4 Pteridophytes = FIRST vascular plants but SEEDLESS; reproduce

5 Gymnosperms = NAKED seeds on cones; no fruit; single

6 Angiosperms = seeds enclosed in fruit; flowers; DOUBLE

WHAT'S NEXT

Next class — Chapter 4: Animal Kingdom

Practice now

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