

Exercise walk-through

Ecological Succession ■ 2.7

eXercise

You must be able to

- distinguish **primary** 初级演替 and **secondary succession** 次级演替
- describe **pioneer species** 先锋物种 and the **climax community** 顶极群落
- order the stages of succession

Method — Primary vs secondary succession

- **Primary succession** — begins on **bare rock** with no soil (after a volcano or glacier retreat); very slow.
- **Secondary succession** — begins where soil **already exists** (after a fire or abandoned farm); much faster.

Method — Pioneer species

The first colonizers are **pioneer species** (lichens, mosses in primary; fast-growing weeds/grasses in secondary). They begin building/enriching soil.

Method — The sequence

Pioneers → grasses → shrubs → fast trees → slow trees, ending in a stable **climax community** that persists unless disturbed.

Method — A worked ordering

After a forest fire (soil remains): grasses → shrubs → pine trees → oak forest (climax). This is **secondary** succession.

Practice 2.1 ■ 1 mark

What is the main difference between primary and secondary succession?

Solution 2.1

Method: Primary vs secondary succession

Worked steps

Primary starts on bare rock with no soil; secondary starts where soil already exists

B1.

Practice 2.2 ■ 1 mark

What are pioneer species?

Solution 2.2

Method: Pioneer species

Worked steps

The first species to colonize a bare area **B1**.

Practice 2.3 ■ 1 mark

What is a climax community?

Solution 2.3

Method: The sequence

Worked steps

A stable, mature community that persists until disturbed **B1**.

Exam-style 3.1 ■ 1 mark

Succession that begins on bare rock with no soil is

- A** primary succession
- B** secondary succession
- C** a climax community
- D** eutrophication

Solution 3.1

Method: Primary vs secondary succession

A primary succession



B secondary succession

C a climax community

D eutrophication

Worked steps

A — primary succession.

Exam-style 3.2 ■ 2 marks

A farm field is abandoned and slowly becomes a forest.

- (a) State whether this is primary or secondary succession, with a reason.
- (b) Order the stages: shrubs, grasses, mature forest, weeds.

Solution 3.2

Worked steps

(a) Secondary — the soil already exists (the field was farmed) **M1** **A1**. (b) weeds → grasses → shrubs → mature forest **M1** **A1**.

Exam-style 3.3 ■ 2 marks

Explain why secondary succession is faster than primary succession.

Solution 3.3

Method: Primary vs secondary succession

Worked steps

Secondary succession already has soil (and often seeds/roots), so plants can establish immediately, while primary succession must first form soil from bare rock, which takes a long time **M1** **A1**.