

2.7 Ecological Succession

Name: _____ Class: _____ Date: _____

Total: 10 marks

Objective

Build the skills to answer exam questions on **ecological succession**.

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

1 Worked examples

Study these first. Each one shows the method for a question type used later —follow the steps and you can do the Practice and Exam-style questions yourself.

■ 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.

■ Pioneer species

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

■ The sequence

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

■ A worked ordering

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

2 Practice

Now apply the methods above.

2.1 What is the main difference between primary and secondary succession? [1]

2.2 What are pioneer species? [1]

2.3 What is a climax community? [1]

3 Exam-style questions

3.1 Succession that begins on bare rock with no soil is [1]

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

3.2 A farm field is abandoned and slowly becomes a forest.

(a) State whether this is primary or secondary succession, with a reason. [2]

(b) Order the stages: shrubs, grasses, mature forest, weeds. [2]

3.3 Explain why secondary succession is faster than primary succession. [2]

4 Go further

You are now ready for the real exam questions on this subtopic:

- work through the **2.7 Ecological Succession** lesson on the **Learn** page;
- read the **Ecological Succession** section of the AP Environmental Science handout on the **Know** page.

Solutions

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

2.2 The first species to colonize a bare area.

2.3 A stable, mature community that persists until disturbed.

3.1 A —primary succession.

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

3.3 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.