

Exercise walk-through

Introduction to Biodiversity ■ 2.1

eXercise

You must be able to

- distinguish **species richness** 物种丰富度 and **evenness** 均匀度
- explain why higher biodiversity increases **resilience** 恢复力
- describe genetic, species, and habitat diversity

Method — Types of diversity

Biodiversity has three levels: **genetic** (variety of genes), **species** (variety of species), and **habitat/ecosystem** (variety of habitats).

Method — Richness and evenness

- **Species richness** — the **number** of different species.
- **Species evenness** — how **evenly** individuals are spread among species.

A community with many species in similar numbers has high diversity.

Method — Resilience

Higher biodiversity gives an ecosystem more **resilience** — it recovers better from disturbances because other species can fill lost roles.

Method — A worked comparison

Community A has 10 species in equal numbers; community B has 10 species where one dominates. A has higher **evenness** and therefore higher diversity.

Practice 2.1 ■ 1 mark

What is species richness?

Solution 2.1

Method: Richness and evenness

Worked steps

The number of different species **B1**.

Practice 2.2 ■ 1 mark

What is species evenness?

Solution 2.2

Worked steps

How evenly individuals are distributed among the species **B1**.

Practice 2.3 ■ 3 marks

Name the three levels of biodiversity.

Solution 2.3

Method: Types of diversity

Worked steps

Genetic, species, and habitat/ecosystem diversity **B1** **B1** **B1**.

Exam-style 3.1 ■ 1 mark

A community with high species evenness has individuals

- A** all of one species
- B** spread fairly evenly among species
- C** with no genetic variation
- D** in a single habitat

Solution 3.1

Method: Richness and evenness

- A all of one species
- B spread fairly evenly among species
- C with no genetic variation
- D in a single habitat



Worked steps

B — spread fairly evenly among species.

Exam-style 3.2 ■ 1 mark

Two communities each have 8 species. In community X one species makes up 90% of individuals; community Y is even.

- (a) Which has higher diversity?
- (b) Explain your answer using richness and evenness.

Solution 3.2

Method: Richness and evenness

Worked steps

(a) Community Y **B1**. (b) Both have the same richness (8 species), but Y has higher evenness (no single dominant species), so Y is more diverse **M1 A1**.

Exam-style 3.3 ■ 2 marks

Explain why higher biodiversity makes an ecosystem more resilient.

Solution 3.3

Method: Resilience

Worked steps

With more species filling more roles, if one is lost others can compensate, so the ecosystem keeps functioning and recovers from disturbance **M1** **A1**.