Exercise walk-through

Aquatic Biomes ▪ 1.3

eXercise

You must be able to

- distinguish **freshwater** 淡水 and **marine** 海洋 systems
- describe productive zones (**estuaries** 河口, coral reefs)
- state the factors that shape aquatic biomes (salinity, sunlight, nutrients)

Method — Freshwater and marine

Aquatic biomes cover most of Earth. **Freshwater** (streams, lakes, wetlands) has low salt; **marine** (open ocean, reefs, estuaries) is salty. They differ in **salinity**, **sunlight**, and **nutrients**.

Method — Highly productive zones

- **Estuaries** — where rivers meet the sea; nutrient-rich and highly productive nurseries.
- **Coral reefs** — high biodiversity, need warm, clear, shallow water.

Method — Factors that shape them

Sunlight (limits photosynthesis with depth), temperature, **salinity**, dissolved oxygen, and nutrient levels all determine what lives where.

Method — A worked reasoning

An estuary is highly productive because rivers deliver nutrients and it is shallow enough for sunlight to reach the producers.

Practice 2.1 ▪ 1 mark

State the main difference between freshwater and marine biomes.

Solution 2.1

Method: Freshwater and marine

Worked steps

Salinity — freshwater has low salt, marine is salty B1.

Practice 2.2 ▪ 1 mark

Where is an estuary found?

Solution 2.2

Worked steps

Where a river meets the sea B1.

Practice 2.3 ▪ 1 mark

Name one factor that shapes an aquatic biome.

Solution 2.3

Worked steps

Any one: salinity, sunlight, temperature, nutrients, dissolved oxygen B1.

Exam-style 3.1 ▪ 1 mark

Estuaries are highly productive because they

A have no sunlight

B are nutrient-rich where rivers meet the sea

C are very deep

D have no life

Solution 3.1

A have no sunlight

B are nutrient-rich where rivers meet the sea ✓

C are very deep

D have no life

Worked steps

B — nutrient-rich where rivers meet the sea.

Exam-style 3.2 ▪ 2 marks

A coral reef is a highly biodiverse marine biome.
(a) State two conditions coral reefs require.
(b) Explain why sunlight limits life in deep ocean water.

Solution 3.2

Worked steps

(a) Warm, clear, shallow water (any two) B1 B1. (b) Sunlight cannot penetrate deep water, so photosynthesis (and the producers it supports) is limited near the surface M1 A1.

Exam-style 3.3 ▪ 2 marks

Explain why estuaries are described as important “nurseries” for marine life.

Solution 3.3

Worked steps

They are nutrient-rich and sheltered, so many marine species breed and their young grow there before moving to the open sea M1 A1.