

Exercise walk-through

Earth's Geography and Climate ■ 4.8

eXercise

You must be able to

- explain the **rain shadow effect** 雨影效应
- describe how large water bodies moderate climate
- link elevation and latitude to climate

Method — The rain shadow effect

When moist air meets a mountain, it **rises**, cools, and drops rain on the **windward** side (wet). The now-dry air descends the **leeward** side, creating a dry **rain shadow** (often a desert).

Method — Water moderates climate

Large bodies of water heat and cool slowly, so **coastal** areas have milder, more stable temperatures than inland areas, which have larger swings.

Method — Elevation and latitude

Temperature **falls** with higher **elevation** and higher **latitude**. A tall tropical mountain can have cold, even snowy, peaks.

Method — A worked link

A desert on the leeward side of a mountain range forms because the air lost its moisture climbing the windward side — a rain shadow.

Practice 2.1 ■ 1 mark

On which side of a mountain does rain fall (rain shadow effect)?

Solution 2.1

Method: The rain shadow effect

Worked steps

The windward side **B1**.

Practice 2.2 ■ 1 mark

How do large water bodies affect nearby temperatures?

Solution 2.2

Method: Water moderates climate

Worked steps

They moderate them — milder, more stable temperatures nearby **B1**.

Practice 2.3 ■ 1 mark

What happens to temperature as elevation increases?

Solution 2.3

Method: Elevation and latitude

Worked steps

It falls (decreases) **B1**.

Exam-style 3.1 ■ 1 mark

A rain shadow desert forms on the mountain's

A windward (wet) side

B leeward (dry) side

C summit only

D base only

Solution 3.1

Method: A worked link

A windward (wet) side

B leeward (dry) side



C summit only

D base only

Worked steps

B — the leeward (dry) side.

Exam-style 3.2 ■ 3 marks

Moist air blows over a mountain range.

- (a) Describe what happens to the air on the windward and leeward sides.
- (b) State the type of ecosystem likely on the leeward side.

Solution 3.2

Worked steps

(a) On the windward side the air rises, cools, and drops rain; the dry air then descends the leeward side, warming and staying dry **M1 M1 A1**. (b) A desert (dry ecosystem) **B1**.

Exam-style 3.3 ■ 2 marks

Explain why a coastal city has smaller temperature swings than an inland city at the same latitude.

Solution 3.3

Method: Water moderates climate

Worked steps

Water heats and cools slowly, so the nearby coast stays milder; inland areas lack this buffer and have larger day-night and seasonal swings **M1** **A1**.