

Exercise walk-through

Adaptations ■ 2.6

eXercise

You must be able to

- distinguish **structural** 结构, **physiological** 生理, and **behavioral** 行为 adaptations
- explain how adaptations arise by **natural selection**
- link an adaptation to survival in an environment

Method — Types of adaptation

- **Structural** — a physical feature (thick fur, sharp claws).
- **Physiological** — an internal process (venom, water conservation).
- **Behavioral** — an action (migration, hibernation).

Method — Adaptations arise by selection

Adaptations are heritable traits that improve survival/reproduction. They spread through a population by **natural selection** over generations, matching the species to its environment.

Method — A worked classification

A camel's hump (fat store) is **structural**; its ability to go without water is **physiological**; a desert lizard being active at night is **behavioral**.

Method — Adaptation and environment

Each adaptation suits a specific challenge — cold, drought, predators — so an organism is well matched to where it lives.

Practice 2.1 ■ 3 marks

Name the three types of adaptation.

Solution 2.1

Method: Types of adaptation

Worked steps

Structural, physiological, behavioral **B1** **B1** **B1**.

Practice 2.2 ■ 1 mark

Classify thick fur on an arctic fox.

Solution 2.2

Worked steps

Structural **B1**.

Practice 2.3 ■ 1 mark

How do adaptations spread through a population?

Solution 2.3

Method: Adaptations arise by selection

Worked steps

By natural selection over generations **B1**.

Exam-style 3.1 ■ 1 mark

Hibernating through winter is a

- A** structural adaptation
- B** physiological adaptation
- C** behavioral adaptation
- D** learned habit only

Solution 3.1

A structural adaptation

B physiological adaptation

C behavioral adaptation



D learned habit only

Worked steps

C — a behavioral adaptation.

Exam-style 3.2 ■ 2 marks

A desert plant has a thick waxy coating and stores water in its stem.

- (a) Classify each of these two features.
- (b) Explain how these adaptations help it survive.

Solution 3.2

Worked steps

(a) Waxy coating = structural; storing water = physiological (or structural stem) **B1 B1**. (b) The waxy coating reduces water loss and the stored water lets the plant survive drought, so it survives in a dry desert **M1 A1**.

Exam-style 3.3 ■ 2 marks

Explain how a beneficial adaptation becomes common in a population over time.

Solution 3.3

Method: Adaptations arise by selection

Worked steps

Individuals with the adaptation survive and reproduce more, passing the trait to offspring; over generations it becomes common in the population **M1** **A1**.