



## EXAM PAPERS PRACTICE

Boost your performance and confidence with these topic-based exam questions

Practice questions created by actual examiners and assessment experts

Detailed mark scheme

Suitable for all boards

Designed to test your ability and thoroughly prepare you

Level: HL IB in Biology  
Subject: Biology  
Topic: IB HL Biology  
Type: Mark Scheme

2002



1583

All International Baccalaureate IB Topic Questions HL Biology

---

**BIOLOGY**

**HL - IB**

Key skills

---

**\*\*Answer 1\*\***

**\*\*C\*\*** is correct: Large ears increase heat loss by radiation and cooling through convection.

- **\*\*Reason\*\***: Desert animals, like the fennec fox, have large ears that help dissipate heat through increased surface area, facilitating heat loss by radiation and convection. This is crucial in hot environments to avoid overheating.

- **\*\*A\*\*** is incorrect: Large ears do not increase heat absorption; instead, they are adapted for heat loss.

- **\*\*B\*\*** is incorrect: Thick fur would trap heat, which is not beneficial in high temperatures.

- **\*\*D\*\*** is incorrect: Thick fur insulates, but in desert animals, the primary concern is losing heat rather than retaining it.

---

**\*\*Answer 2\*\***

**\*\*D\*\*** is correct: Counter-current heat exchange in limbs to reduce heat loss.

- **\*\*Reason\*\***: Animals in cold environments, like Arctic mammals, use counter-current heat exchange to keep blood near the core warm and reduce heat loss through extremities.

- **\*\*A\*\*** is incorrect: Reduced fur density would increase heat loss, which is not adaptive in Arctic environments.

- **\*\*B\*\*** is incorrect: A smaller body size would increase the surface area-to-volume ratio, leading to more heat loss.

- **\*\*C\*\*** is incorrect: Dark pigmentation absorbs heat, but animals in the Arctic rely more on insulation than heat absorption to maintain body temperature.

---

**\*\*Answer 3\*\***

**\*\*B\*\*** is correct: Deep root systems to access underground water supplies.

- **\*\*Reason\*\***: Xerophytes, plants in dry environments, often develop deep roots to access water that is far below the surface.

- **\*\*A\*\*** is incorrect: Xerophytes have thick cuticles to reduce water loss, not thin cuticles, and broad leaves increase transpiration, which is not desirable in dry environments.

- **\*\*C\*\*** is incorrect: Xerophytes usually have fewer stomata to conserve water, and they are often located on the lower surface to reduce water loss.

- **\*\*D\*\*** is incorrect: Shallow roots do not help in dry environments, where deep roots are needed to access deeper water sources.

---

**\*\*Answer 4\*\***

**\*\*B\*\*** is correct: Shunting blood flow to vital organs and reducing metabolism.

- **\*\*Reason\*\***: Diving animals, like seals, conserve oxygen by redirecting blood flow to vital organs and lowering their metabolic rate, thus reducing the overall oxygen demand during a dive.

- **\*\*A\*\*** is incorrect: Increasing heart rate would increase oxygen consumption, which is counterproductive during a dive.

- **\*\*C\*\*** is incorrect: Storing oxygen in the lungs is limited; many diving mammals collapse their lungs to avoid buoyancy and nitrogen absorption.

- **\*\*D\*\*** is incorrect: Reducing muscle activity conserves oxygen; increased activity would use up oxygen more quickly.

---

**\*\*Answer 5\*\***

**\*\*A\*\*** is correct: Larger gill surface area for enhanced gas exchange.

- **\*\*Reason\*\***: Fish in oxygen-poor environments adapt by having larger gill surface areas to increase oxygen uptake from the water.

- **\*\*B\*\*** is incorrect: A higher metabolic rate would increase oxygen demand, which is detrimental in low-oxygen environments.

- **\*\*C\*\*** is incorrect: Increased hemoglobin production enhances oxygen-carrying capacity, not decreased production.

- **\*\*D\*\*** is incorrect: While anaerobic respiration can be used, fish still rely heavily on oxygen and prefer to maximize aerobic respiration through gill adaptations.

---