

9.6 Ocean Warming

Name: _____ Class: _____ Date: _____

Total: 10 marks**KEY WORDS** coral bleaching 珊瑚白化 • greenhouse effect 温室效应

Objective

Build the skills to answer exam questions on **ocean warming**.**You must be able to:**

- explain how oceans **absorb heat** and its effects
- describe **coral bleaching** 珊瑚白化
- link warming to sea-level rise and species shifts

1 Worked examples

Study these first. Each one shows the method for a question type used later — follow the steps and you can do the Practice and Exam-style questions yourself.

■ Oceans absorb heat

The oceans have absorbed most of the extra heat from the enhanced greenhouse effect, so **ocean temperatures are rising**.

■ Coral bleaching

Warmer water stresses corals, causing them to **expel** the symbiotic algae (zooxanthellae) that feed and color them — the coral turns white (**bleaches**) and can die.

■ Other effects

- **Thermal expansion** — warm water expands, raising **sea level**.
- **Species shifts** — marine species move toward cooler (polar/deeper) water.
- Lower **dissolved oxygen** in warmer water.

■ A worked link

A marine heatwave warms a reef; the corals bleach as they lose their algae, and if the heat persists, the reef dies — losing the habitat for many species.

2 Practice

Now apply the methods above.

2.1 Why are ocean temperatures rising? [1]**2.2** What happens to corals when water gets too warm? [1]**2.3** How does ocean warming contribute to sea-level rise? [1]

3 Exam-style questions

3.1 Coral bleaching happens when corals expel their [1]

A	B
C	D

A symbiotic algae due to heat stress**B** skeletons**C** predators**D** eggs**3.2** A reef experiences a prolonged marine heatwave.

(a) Explain how bleaching occurs and why it can kill the reef. [3]

(b) State one wider consequence of losing the reef. [1]

3.3 Explain how thermal expansion of the ocean raises sea level. [2]