

# Topic 1: Oxygen production

**Q1. The ocean produces more than half of the oxygen we breathe.**

☐

True

☐

False

**Q2. What tiny ocean organisms are responsible for producing most of the ocean's oxygen?**

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A. Coral

☐

B. Seaweed

☐

C. Phytoplankton

☐

D. Jellyfish

**Q3. How do phytoplankton produce oxygen?**

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A. By breaking down saltwater

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B. Through photosynthesis, using sunlight and carbon dioxide

☐

C. By eating other sea creatures

☐

D. By floating near coral reefs

**Q4. The oxygen produced in the ocean stays underwater and doesn't affect humans.**

☐

True

☐

False

**Q5. Which of the following is a reason why protecting the ocean helps protect the air we breathe?**

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A. Ocean animals clean the air

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B. Saltwater filters pollution

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C. Healthy oceans support phytoplankton that make oxygen

☐

D. Seaweed turns into oxygen tanks



# Topic 1: Ocean power generation

Read the passage to help you work out each clue below and decide which type of ocean power it describes.

The ocean can generate power in four different ways. One method is thermal energy, which uses the temperature difference between the sun-warmed surface water and the much colder deep water. If the difference is at least 25°C, the warm water can be used to make steam, which powers a turbine to create electricity. Another method is wave energy, which works like an underwater blowhole, as waves push water in and out of a chamber, air is forced through a turbine to generate power. This system has no moving parts under the water. Current energy relies on strong, steady movements of deeper ocean water flowing through underwater turbines to produce electricity. Finally, tidal energy uses the rise and fall of the tides to turn large turbines on the ocean floor. Offshore wind farms also generate power at sea, using strong, consistent ocean winds to turn large turbines mounted on floating or fixed platforms. All of these methods take advantage of the ocean's natural movements to create clean, renewable energy.

Choose the correct answer from:

A. THERMAL

B. WAVES

C. CURRENTS

D. TIDAL

Q1. Uses the temperature difference between warm surface water and cold deep water to create steam and power a turbine.

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Q2. Works like an underwater blowhole, waves force air through a chamber to drive a generator.

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Q3. This method uses large underwater turbines moved by the rising and falling of tides.

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Q4. This method relies on steady, deep-water movement to spin submerged turbines.

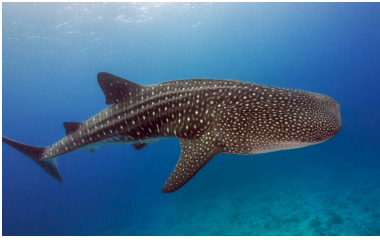
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Q5. This method creates steam from warm water, which powers a generator but only if the surface is at least 25°C.

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# Topic 3: Amazing biodiversity



## What am I?

I am the largest fish in the sea, with a spotted body and a wide mouth perfect for filter-feeding tiny plankton.



## What am I?

I am well camouflaged. I live in the southern and western coastal waters of Australia.



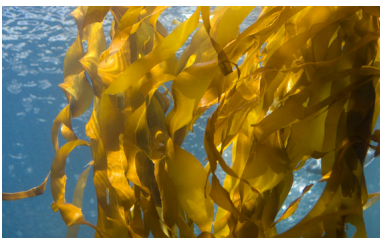
## What am I?

I am named after three different animals. The first for my black colours, the second for my forelegs and posture, and the last for what I actually am. I can hit so hard I can break glass, and I can see cancer cells.



## What am I?

I glide through the ocean with flippers, have a hard shell for protection, and sometimes travel thousands of kilometres to nest.



## What am I?

I can grow up to 60 metres tall. My forests are shelter for fisheries and many sea creatures. I can be eaten as food, am used in medicines, capture carbon and remove pollution. My value to the world has been estimated at US\$500 billion/yr.



## What am I?

I provide shelter to 25% of all the ocean's creatures. I look like colourful underwater rocks, but I'm made of tiny living animals working together.

# Topic 4: Climate regulation

Read the following key dot-points, which detail how the ocean regulates our climate:

- **Surface absorption:** Just like trees absorb CO<sub>2</sub> from the air, the ocean surface also absorbs large amounts of CO<sub>2</sub> directly from the atmosphere, especially near wave zones and cool waters.
- **Phytoplankton are the 'trees' of the ocean:** Tiny organisms called phytoplankton live near the ocean's surface and use photosynthesis to take in CO<sub>2</sub>, just like land plants. They're responsible for producing a huge portion of the oxygen we breathe.
- **Ocean as a carbon sink:** When phytoplankton die or are eaten, some of the carbon they store sinks into deeper water. This is called carbon sequestration. The deep ocean stores carbon for hundreds or even thousands of years, much like how soil stores carbon on land.
- **Climate regulation:** Just like forests and soils help regulate CO<sub>2</sub> levels, the ocean plays a vital role in balancing the Earth's climate by absorbing heat and carbon, helping to reduce the impact of climate change.

Draw a quick sketch of this process below!



# Topic 5: Human benefits

The ocean has been a source of sustenance to humans for tens of thousands of years. You heard from Blue Minds about how they feel when on or near the ocean. Have you felt happy, excited, or peaceful when enjoying activities in or on the sea? Perhaps simply walking along the beach, discovering shells or washed-up cuttlefish cartilage, or even just listening to the waves? Recreation is one of the ocean's human benefits.

**Can you match the images to one of five categories of human benefit?**

- Food and resources
- Climate regulation
- Transportation and trade
- Recreation
- Cultural and spiritual



Offshore wind farm



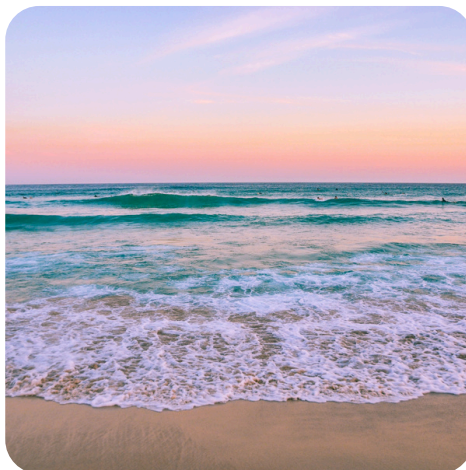
Tourism



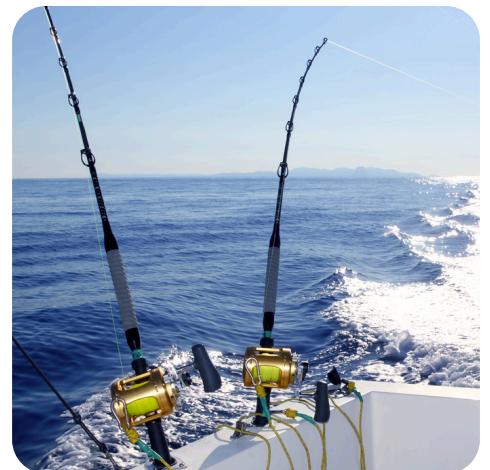
Extreme weather



Cargo ship



Beach



Fishing