Knowledge organiser

Blue Abyss

Oceans and seas

Just over two thirds of the Earth's surface is covered with water. Most of this water is found in oceans. There are five oceans called the Atlantic, Pacific, Indian, Arctic and Southern Oceans. Each ocean has its own climate, depending on its location in the world. Seas are smaller than oceans and can be surrounded by land.

Food chains

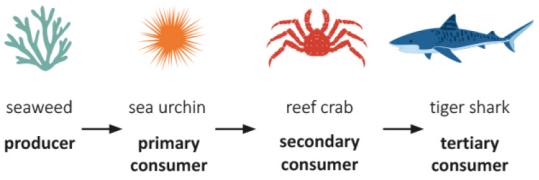
All living things need energy to survive. Food chains show where living things get their energy and how all species living in an environment depend on each other.
For example, if the producer in a food chain is in short supply, it will affect all the consumers in that food chain.

Producers are found at the beginning of a food chain. They are usually green plants. They use energy from the Sun to make their own food in a process called photosynthesis.

Consumers get energy from eating plants or animals.

Prey are animals that are eaten by other animals.

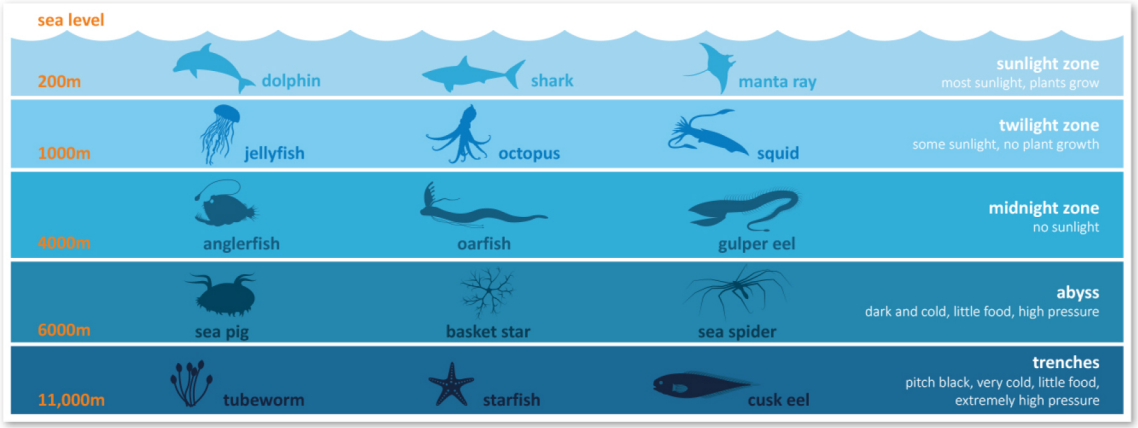
Predators are animals that hunt, kill and eat other animals to get their food.



Example of a food chain in the Great Barrier Reef

Ocean layers

The ocean has five different layers: the sunlight zone, the twilight zone, the midnight zone, the abyss and the trenches. As the depth increases, the temperature and light levels fall, and the pressure rises making it a difficult place to live. Oceans are home to hundreds of thousands of marine species, each specially adapted to live at specific depths.



Bioluminescence

Some marine animals have chemicals in their cells that make light or bacteria that live on them and produce light. This is called bioluminescence. Bioluminescence can be used as defence, camouflage, to attract prey or to see in the dark. The most common colours of bioluminescence are blue, green and red.

Jellyfish displaying bioluminescence

Great Barrier Reef

Corals are marine invertebrates that live in large groups called colonies. Some species produce a hard exoskeleton that forms into a coral reef. The Great Barrier Reef, on the north-eastern coast of Australia, is the longest and largest coral reef in the world, with over 600 types of coral. Corals are at risk of being destroyed by climate change, pollution and consumers.

Tropical fish in a coral reef

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Tip: Print in A3.

Timeline of Jacques Cousteau

Jacques Cousteau was an explorer, television presenter and inventor. His television shows and films showed people what was in the ocean for the first time.

1910	Born on 11th June in Saint-André-de-Cubzac, France.
1930	Joins the French Naval Academy.
1936	Goes underwater swimming with goggles and begins exploring the sea.
1942	Makes his first underwater film, *Sixty Feet Down*.
1943	Develops an underwater breathing apparatus, the aqua-lung, with engineer Émile Gagnan.
1945	Begins working for the Undersea Research Group, funded by the French Navy.
1947	Sets the world record for freediving.
1950	Uses a ship called the *Calypso* for research, diving and filming.
1953	Co-authors the book, *The Silent World,* which tells the story of his undersea discoveries and adventures.
1956	Releases his first underwater colour film, *The Silent World*.
1959	Invents an experimental underwater vehicle.
1966–76	Produces a television documentary, *The Undersea World of Jacques Cousteau*.
1985	Awarded the Presidential Medal of Freedom by the American president Ronald Reagan, for his contributions to science.
1997	Dies on 25th June.

Ocean exploration

Diving

Ocean diving can be dated back to 4500 BC when people in the coastal areas of Greece and China dived for food. Cousteau's invention of the aqua-lung meant divers could take air with them, spending more time under the water and going deeper than ever before. Cousteau used the aqua-lung to explore and film the underwater world more freely.

Deep sea diver using an aqua-lung to breathe

Submarines

In 1620, Cornelis Drebbel built the first submarine. He tested it in the River Thames up to depths of around 4.5m for up to three hours. Today, submarines are used for exploring the deep oceans. They are built to withstand the extreme pressure and have robotic arms to collect marine creatures and samples from the bottom of the ocean.

Oceanography

Between 1872 and 1876, the Royal Navy ship HMS *Challenger* took part in a four-year expedition around the world. The crew collected information and carried out investigations into the world's oceans. The results were published in *The Challenger Report* and became the basis of modern oceanography.

Glossary

adapt	A change in an animal or plant that helps it to survive in its environment.
camouflage	The way some animals are coloured or shaped to blend in with their natural surroundings.
climate	The weather conditions in a place over time.
conservation	The protection of an animal or area from damage.
coral	Marine invertebrates that live in large colonies and produce a hard exoskeleton.
freediving	The sport of diving underwater without breathing equipment.
habitat	The natural environment where a plant or animal normally lives.
oceanography	The scientific study of the oceans and everything in them.
organism	An individual animal, plant or microorganism.
pressure	A force that is produced when something presses or pushes against something else.
species	A group of animals or plants that share the same characteristics and can breed with each other.
submarine	A ship that can travel underwater.

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