

# The Blue Planet

## Amazing Fact

The deepest spot in the ocean is Challenger Deep, part of the Mariana Trench, which is 10 994 metres below sea level. If you could lower Mount Everest to the bottom of the trench and then stand on top of it, you would still be over 2km below the surface.

Did you know that the earth is sometimes referred to as 'the blue planet?' This is because the world's five oceans cover two thirds of the earth's surface. From space, this makes the earth look blue.

Although there is a wide variety of life in the world's oceans, not all animals and plants can live everywhere. Oceans are divided into different zones, each categorised by such things as: amount of sunlight, water pressure, salinity (amount of salt) and temperature.

## Challenge

Use the Internet and non-fiction books to research the different zones of the world's oceans. Record your findings on the diagram on the next page. The names and depths have been included for you. Sketch and make notes in the correct zone.

Include:

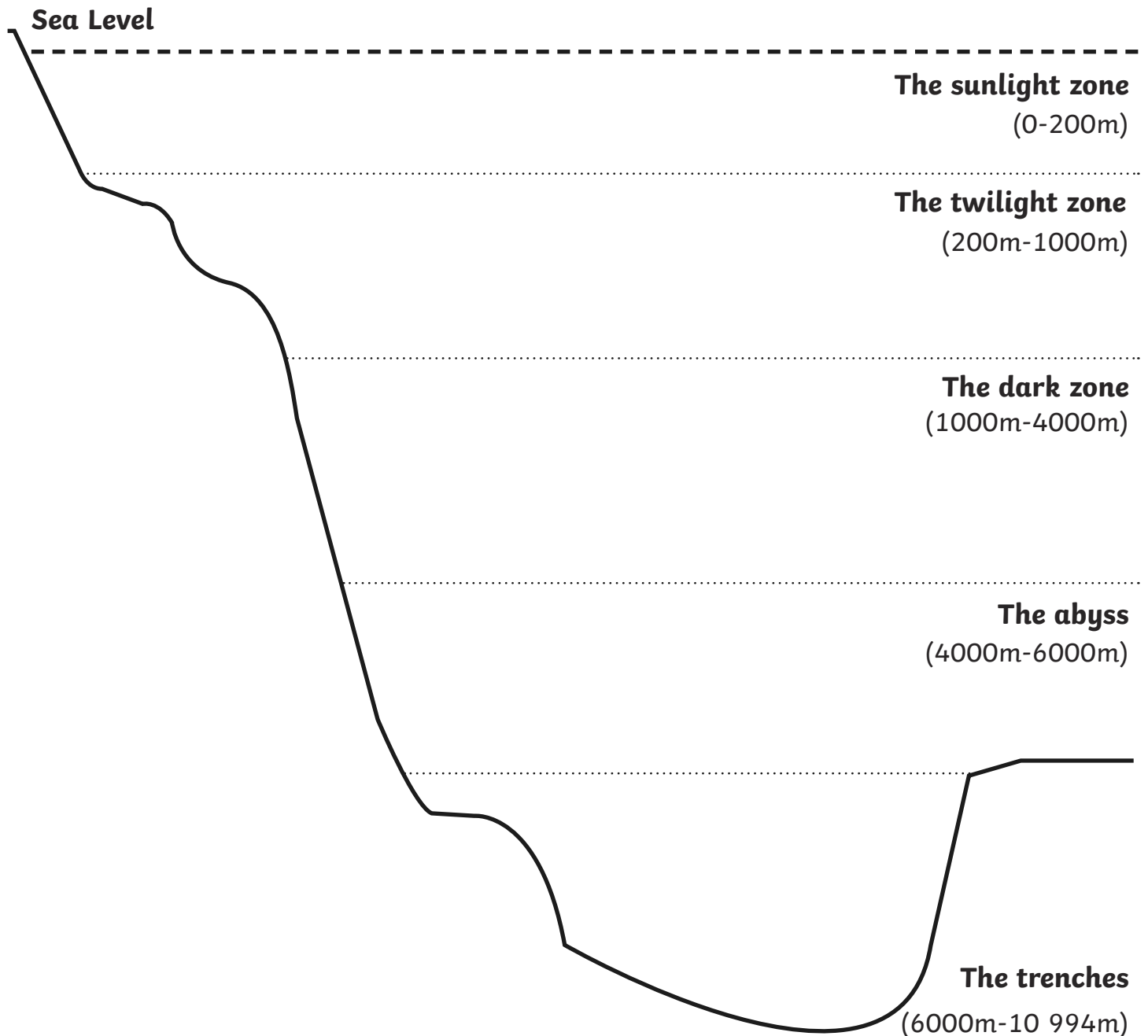
- the average temperature in each zone;
- examples of plants and animals living in the zone;
- the effects pressure would have at that depth;
- what exploration has been carried out in each zone.



You could also try to find out:

- if anyone has been to the bottom;
- if any life exists at the bottom of the trench;
- how the depth is measured;
- what happens to the pressure of water at such depths.

# The Blue Planet



# The Blue Planet - Answers

## The Sunlight Zone

Average temperature = 17°C

There are many plants and animals as there is enough light for photosynthesis to take place. Plants and animals include seaweed, algae (red, green and brown), sharks, jellyfish, sea turtles, seals, corals and many more.

Exploration is easy and usually done by divers.

Due to the hydrostatic pressure, divers first feel the pressure on their ear drums.

At 100 feet, they will feel pressure against their body, lung capacity is reduced making it harder to breathe.

At 180 feet, divers have reached the limit of safe diving for humans.

## Twilight Zone

Average temperature = 4°C

There are no plants in this zone or any others below as there is not enough light. Animals include squid, octopuses, jellyfish, bony fish. Many of these organisms emit a light which is known as bioluminescence.

Divers need special suits and diving crafts to explore this layer such as the JIM suit (an atmospheric diving suit).

## The Dark Zone

Average temperature = 4°C

Animals include anglerfish, cookie-cutter shark, crabs and other crustaceans and vampire squid.

This zone is largely unexplored. Technologies used to explore it, such as submersible crafts, have only recently been developed in last 30 years. It is believed that less than one-millionth of the sea's darkness has been explored.

## The Abyss

Average temperature = 2-3°C

Animals include anglerfish, deep sea jellyfish, deep sea shrimp, viperfish and molluscs. These animals are specially adapted to survive as they tend to be small with large, flexible stomachs and big mouths. This is because food can be hard to find so when they do, they need to eat a lot and store it in their stomach.

# The Blue Planet - Answers

## Trenches

Average temperature = 1-4°

Life does exist. Animals include tube worms, starfish, amphipods, cusk-eels, lobsters, crabs and prawns, rat-tail fish and liparid fish.

## Has anyone been to the bottom of the sea?

The first expedition to the bottom of the sea took place in 1960 Lieutenant Don Walsh and Jacques Piccard.

On 26th March 2012, James Cameron journeyed to deepest place in the ocean, the Mariana Trench in the western Pacific in the 'Deepsea Challenger'. This was a vertical torpedo which took 70 minutes to descend 7 miles

## Life on the seabed

Life has been discovered in the form of single-celled organisms and bacteria. They get their nutrients by breaking down coal and other hydrocarbons.

## How is the depth of the ocean measured?

A sounding line (a rope that has a weight attached) is lowered over the side of a ship. When the weight hits the seafloor, the line goes slack, and is marked at the water's surface. The weight is pulled back up and the distance from the surface mark to the weight is measured. This length equals the depth of the ocean at that point.

## What happens to the pressure of water at such depths?

The deeper you go under the sea, the greater the pressure of the water pushing down on you. This is known as hydrostatic pressure; the force per unit area exerted by a liquid on an object. The deepest point ever reached by man is 10 929 metres below the surface of the ocean. The temperatures in the abyssal and trench zones are hundreds of times greater than those at the ocean's surface.