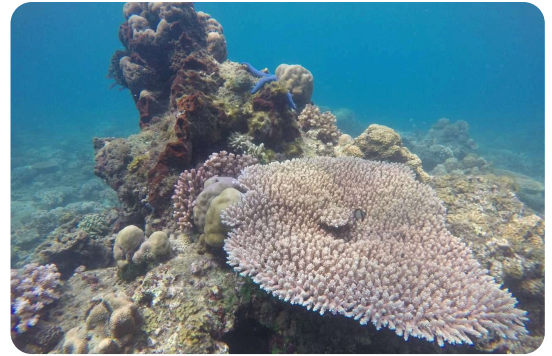




Down into the deep

Lesson plan: the ocean's layers from the sunlight zone to the trenches, a pressure experiment, deep-sea animals, and the Philippines' own deep trench



Ages	8 to 11 (grades 3 to 6)
Time	45 to 60 minutes
Group	Up to 35 students
Where	Any classroom, with a tray or sink for the experiment
You need	The slides, a plastic bottle, a pin or nail to make holes, tape, a tray, one build-the-ocean sheet per student, scissors and glue

What students learn

- The ocean has layers, named by how much light reaches them.
- Light, temperature and pressure change with depth.
- How deep-sea animals are adapted to the dark.
- The Philippine Trench is one of the deepest places on Earth, and most of the ocean floor is still unmapped.

Before the lesson

1. An adult makes three holes in a plastic bottle beforehand, one above the other, and covers them with tape.
2. Print one **build the ocean** sheet per student.

The lesson

- 1 The layers 10 minutes, slides 1 to 3.** Walk down the depth scale. Point out that Mount Everest would fit inside the Philippine Trench.
- 2 Pressure bottle 8 minutes, slide 4.** Demonstrate over a tray. The bottom hole squirts furthest.
- 3 Who lives where? 15 minutes, slides 5 and 6.** Students cut out and stick the animals in the right zones.
- 4 Our deep trench 8 minutes, slides 7 and 8.** Share the Emden Deep story and how little of the seafloor is mapped.
- 5 Wrap up 5 minutes, slide 9.** Discuss one or two questions.

Answers and what to listen for

Answers: corals and sea turtles in the sunlight zone, lanternfish in the twilight zone (they rise to feed at night), sperm whales, deep-sea squid and anglerfish in the midnight zone, amphipods in the trenches. Many animals move between zones, so accept reasoned answers.

Making it easier or harder

- **Younger groups:** use three zones only: sunlit, dark and very deep.
- **Older groups:** find out what a submersible needs to survive the pressure at 10,000 m.
- **Link:** the How do we know? module explores how scientists check surprising facts.

Safety and good practice

- Adults make the holes in the bottle. Keep water away from electrical equipment.

Curriculum links

- **Science:** Earth and space, living things and their environment, forces.
- **Ocean Literacy Principle 7:** the ocean is largely unexplored.

The teacher reading has the science behind every slide, with links to the sources.

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