

Welcome to OpenUpScience, the weekly magazine from Cambridge Science Centre. In this issue, we are exploring oceans.



Nearly three quarters of the World is covered with water. There are five oceans (Atlantic, Pacific, Indian, Arctic and Southern) and lots of smaller seas.

The bottom of the ocean is not flat like a beach. There are high mountains and deep valleys under the water. Some parts of the ocean are so deep that sunlight never reaches them.

Did you know...?

An incredible 94% of Earth's living species exist within the oceans

Spark, Ignite, Fuel, Illuminate

Float or sink?



What you'll need

A basin, or large bowl, full of water and a variety of objects to test, gathered from around your home, ideally of a similar size and shape. Include a satsuma (or similar) and some plasticine if possible!

What to do

1. Gather your kit and fill the bowl with water.
2. Before you test, decide whether you think each object will sink or float. In science, this is called a hypothesis.
3. Time to test your hypothesis! Lower each object, one at a time, into your bowl of water. Did they float or sink? Were you correct? Or were there some surprises?
4. If you have a satsuma in your collection, try peeling it and see if that makes a difference.
5. If you have a ball of modelling clay in your collection, see if changing the shape will help it to float.

How does it work?

Whether an object sinks or floats depends on something called density. If the particles, or molecules, of an object are very tightly packed, then the object will be more dense than an object of the same shape and size but with loosely packed particles. If an object is more dense than the liquid it is placed into, it will sink, but in the same liquid a less dense object will float.

Diver in a bottle

A floating and sinking experiment

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What you'll need

- An empty 2L bottle with lid
- A bendy straw
- A pair of scissors
- Modelling clay/Blu tack
- A glass or jug of water
- Water



What's happening?

When you squeeze the bottle, the air trapped in the bendy straw is squeezed too. The diver becomes more dense than the water around it and so it sinks. When you stop squeezing, the squeezed air expands and the diver rises again.



What to do

1. Gather your kit.
2. Bend the straw at the bendy bit. Cut the straw as shown by the orange line.
3. Wrap a small amount of modelling clay or Blu tack around the bottom of the bent straw (don't block the ends of the straw).
4. Check that your diver floats in a glass of water (you might need to adjust the amount of modelling clay).
5. Fill the bottle right to the top with water. Pop the diver in the top and put the lid on.
6. Gently squeeze and release the bottle and watch the straw diver sink to the bottom and rise back to the top.



Underwater wonderland

Who lives where in the ocean?

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There are five ocean zones (as shown). The deeper you go, the darker it gets. Light only reaches about as far as the bottom of the twilight zone. Some creatures that live in the dark zones are blind!



What you'll need

- A shoebox or cereal box
- Coloured pens or pencils
- Glue stick
- Blu tack/sticky tape
- String or cotton
- Paper
- Ocean creatures template

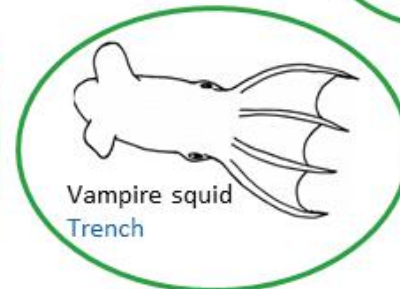
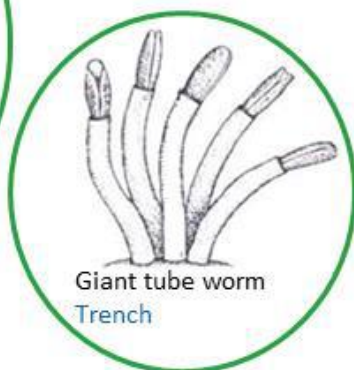
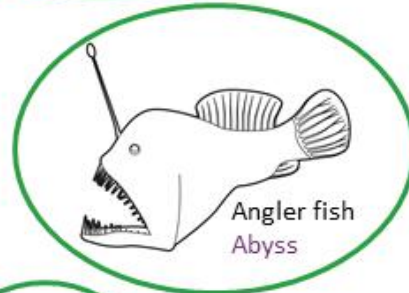
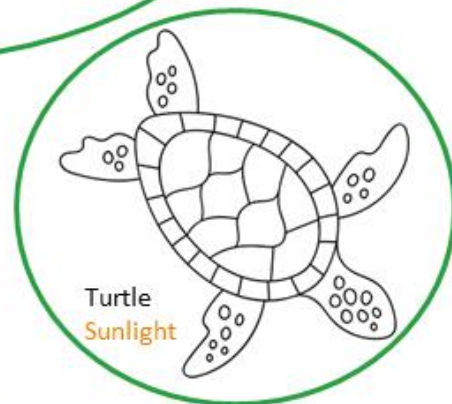
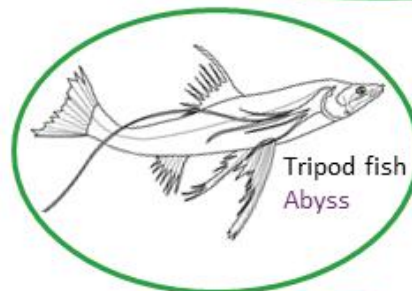
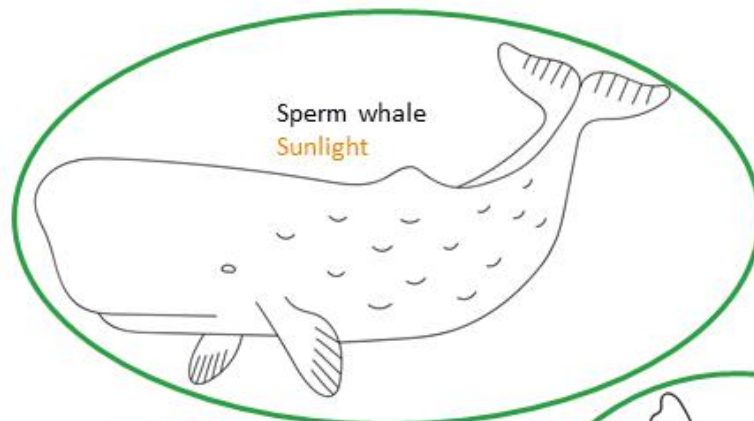
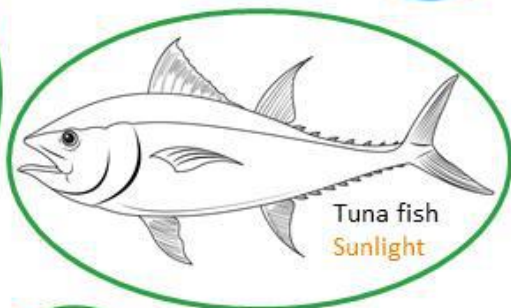
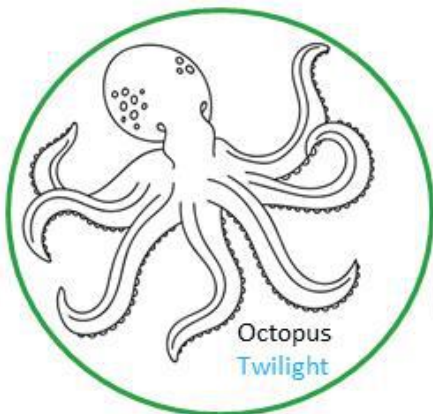
What to do

1. Cut off the front of your box. Use the box on its side.
2. On a piece of paper, colour in the ocean zones in different colours. Try to use darker colours as you go deeper into the ocean. Fix your paper to the back of your scene.
3. Colour and cut out the ocean creatures (pull-out template)
4. Attach each creature to a piece of string with blu tack or tape.
5. Fix the string into the shoe box so that the creature is hanging in the correct ocean zone.

Send photos to: OpenUpScience@cambridgesciencecentre.org

Underwater wonderland

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Ocean quiz

(Answers on the back page.)

1. Which of these is NOT an ocean?
A. Atlantic
B. Channel
C. Pacific
D. Indian
2. What is the name for a scientist who studies the oceans?
A. Cartographer
B. Oceanographer
C. Biologist
D. Marinerd
3. Which of these is NOT a zone in the ocean?
A. Moonlight
B. Sunlight
C. Midnight
D. Trench
4. Which of these creatures can be found in the Abyss ocean zone?
A. Tripod fish
B. Sperm whale
C. Seahorse
D. Octopus

Ocean word game

An oceanographer is someone who studies the ocean. How many other words can you make out of the letters in oceanographer?

oceanographer

a h
n o r p
e a o e r
c g

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Salty water

Water in the oceans is salty, but water in rivers is not. Let's see what happens when salty water meets fresh water.



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What to do

1. Half-fill both jugs with water.
2. To one jug add a tablespoon of salt and stir until it dissolves. Keep adding salt until no more will dissolve.
3. Stir in a drop of food colouring.
4. Add a drop of the other colour of food colouring to the other jug of water.
5. Half fill the tall glass with the salt water.
6. Gently pour the fresh water down the side of the glass.
7. You should now see two distinct layers in the water.

What you'll need

- Two jugs
- A tall narrow glass
- Salt
- Water
- A spoon
- Two different colours of food colouring

How does it work?

Salt water is denser than freshwater – it's why we float more easily in the sea than in a swimming pool! The less dense fresh water floats on top of the sea water. This is important in the oceans as it affects how water mixes. Melting glaciers release fresh water into the ocean, making the surrounding area less salty. The seawater becomes less dense, and this can cause changes to important patterns of ocean currents.

Ocean puzzle

Fit the names of the marine creatures into the grid



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Whale
Seahorse
Shark
Fur seal
Dolphin
Crab
Fish
Octopus
Starfish
Jellyfish
Turtle

This Week's Challenge

Try our Plankton Challenge!

Plankton are food for many ocean animals and they live in the Sunlight Ocean zone, just below the surface.

Using objects like straws, cocktail sticks, plasticine, bubble-wrap, cardboard, paperclips or anything else you think of, try to make your own plankton that will float just below the surface in a large jug or bowl of water.



Puzzle
Solution



Ocean word game

Here are a few that we found – how many could you find?

Oceanographer

Grape
Ocean
Ace
Graph
Hero
Green
Harp

Next Issue: Flight

Make some fascinating fliers and practice your paper aeroplane skills.

Send us your work! OpenUpScience@cambridgesciencecentre.org

Send us your questions! Look out for the answers on:

[Science@6 - YouTube, Monday, 6pm](#)

Help us improve OpenUpScience! Let us know what you think: [/link.cambridgesciencecentre.org/feedbackissue6](https://link.cambridgesciencecentre.org/feedbackissue6)



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Quiz Answers: Q1 – B, Q2 – B, Q3 – A, Q4 – A