Carbon capture in Oman

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Friday, June 20, 2025

Learning Goals

1. Know what carbon capture is and why is it important in the fight against climate change.
2. Understand the chemistry of mineralisation.
3. Use the case study of 44.01 as an example of effective climate action in Oman.

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Ophiolite

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What is Ophiolite?

Ophiolite is a rock formation, or suite of rocks that often includes rocks such as limestone, basalt, gabbro, and **peridotite**.

The ophiolite rock formations represent a section of Earth's oceanic crust that has been uplifted above sea level through tectonic processes, such as subduction or continental collision.

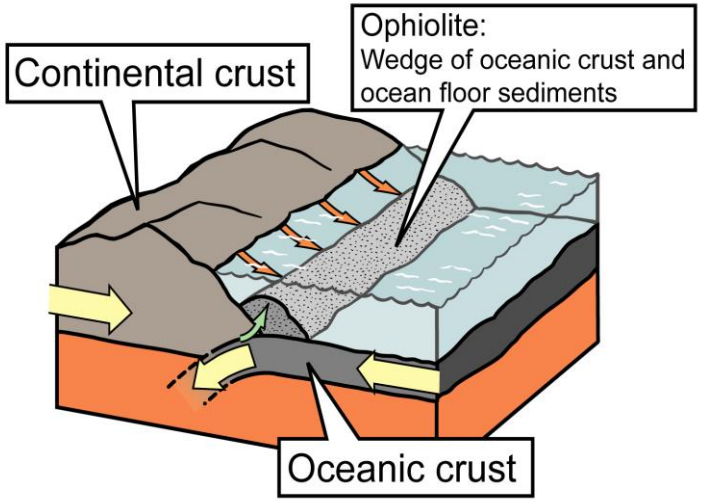

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Image Source: J. Houghton © modified by the Earth@Home project

Locating ophiolite

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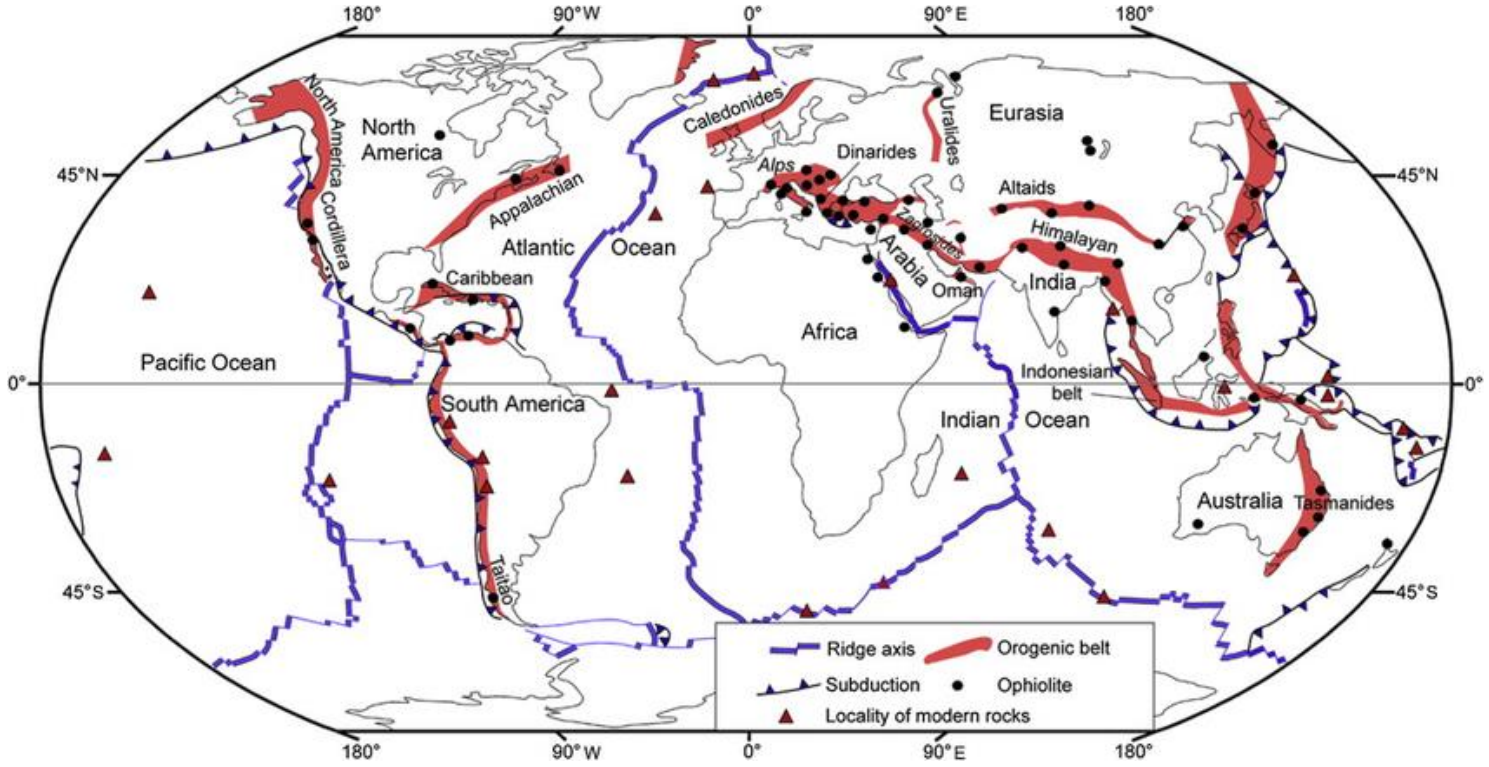

The map shows the global distribution of ophiolite belts. These linear regions of uplifted and exposed rock reveal multiple layers of rock, one of which is peridotite.

Using the map, describe the distribution of ophiolite.

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Image source: Global distribution of ophiolitic belts © ResearchGate

Using peridotite for carbon capture

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The Oman Ophiolite Belt is one of the best-preserved and studied ophiolite regions in the world. It is one of the largest and most complete sequences in the world.

In Oman, a company called 44.01 has developed a technology to **capture carbon** and **bury** it underground using **peridotite**. This technology is both effective and scalable, meaning it has the potential to achieve negative emissions in the future, making it a promising form of negative emissions technology.

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What is carbon capture?

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Watch the following video and answer the questions on carbon capture on your sheet.

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Who are 44.01?

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From the video, summarise who 44.01 are and what they do on your sheets.

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The rock candy experiment

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Task

We are going to start an activity today that illustrates the process of **crystallisation**, called the rock candy experiment.

On your desks, check that you have the following supplies:

- ✓ A clean glass jar
- ✓ String or wooden skewers
- ✓ A pencil or chopstick
- ✓ Sugar
- ✓ Water
- ✓ Food colouring (optional)
- ✓ Paper clips (if using string)
- ✓ Safety goggles
- ✓ Protective gloves

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The rock candy experiment

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Step 1

Heat some water in a pot and gradually dissolve sugar into it, stirring constantly. Continue adding sugar until no more can dissolve, creating a ‘supersaturated solution’.

Step 2

Tie a string to a pencil or chopstick and rest it across the top of the jar, with the string hanging into the sugar solution. Attach a paper clip to the bottom of the string to weigh it down (you can use a wooden skewer instead of a string).

Step 3

Add your food colouring.

Step 4

Place the jar in a safe spot and cover it loosely with a lid or plastic wrap. Leave it undisturbed for several days. As the water evaporates, sugar molecules will crystallise on the string/skewer.

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Exit ticket

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Using your exit ticket, write a question on something to do with today's lesson. Swap the ticket with your partner. To exit the classroom, you must answer the question correctly.

What should be reviewed in a future lesson?

How do you feel about your work today?

★EXIT★ TICKET

What should be reviewed in a future lesson?

How do you feel about your work today?

★EXIT★ TICKET

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