Lesson Plan - Episode 4: Climate Change and our Ocean

Module Summary

This module provides a big picture explanation of what is happening across the world and in the ocean in terms of Earth's processes and how this is influencing climate change. Students will discover why ocean health is so important and gain a deeper understanding of how humans have altered it. They will also understand how we can have a beneficial impact on the ocean and how CCMI is working to do that. Participants engage through the interactive platform by asking questions, taking part in live polls, chatting with the CCMI team, and completing an in-class worksheet (provided). All educational materials align with Cayman Islands and United Kingdom Science National Curriculums and Ocean Literacy Principles.

Friday 6th June 2025; 10 am EST (UTC -5h)

Duration: 40-minute broadcast, 1 hour lesson

Years 4,5 & 6

Learning Objectives

- Understand what climate change is and how it impacts ocean life
- Understand the important role the ocean plays in climate regulation
- Explain Blue Carbon and initiatives to help mitigate climate change

The Cayman Islands and United Kingdom National Science Curriculum

- Recognise that environments can change and that this can sometimes pose dangers to living things. (Year 4)
- Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature (Year 4)

Ocean Literacy Principles

- Ocean Literacy Principle #3: The Ocean is a major influence on weather and climate
- Ocean Literacy Principle #4: The ocean makes Earth habitable

- Ocean Literacy Principle #5: The ocean supports a great diversity of life and ecosystems
- Ocean Literacy Principle #6: The ocean and humans are inextricably interconnected

Description of Live Lesson

This module will take place on a coral reef ecosystem along the coast of Little Cayman in the Cayman Islands, where the CCMI team will guide students through a series of learning objectives. A topside host will communicate in real time with the underwater educator and the students who join as the remote audience/virtual dive buddies.

Through the broadcast, participants will develop an understanding of climate change: what it is, how the ocean impacts Earth's processes, and how this links to climate change. Participants will be guided through the concept of "Blue Carbon" and some ecosystems that contribute to carbon storage. The hosts will explain how CCMI scientists develop projects to study carbon storage in Little Cayman's ecosystems and how this may be useful for mitigating climate change. Additionally, students will have the opportunity to participate in the DearTomorrow campaign by learning about how individuals can make a difference and making pledges for their own lives.

By the end of the broadcast, students will better understand how everything on earth is connected and how our individual and collective actions have an impact on the wider environment. They will come away from this broadcast understanding actions each person can take to protect the ocean and help preserve marine biodiversity for future generations.

This lesson aligns with the Science National Curriculum of the Cayman Islands and the United Kingdom and the Ocean Literacy Principles. Students can complete the worksheet during the live lesson, and they are encouraged to ask questions about the materials to the host or educator at any time during the broadcast. Pre-recorded footage may be used to show key concepts should these observations not be seen naturally during the live lesson.

Live broadcast outline (40 mins)

00:00 – 02:00	Welcome back to Reefs Go Live, CCMI team introductions
02:00 – 04:00	Intro to World Ocean Day
04:00 – 06:00	What is climate change?
06:00 – 10:00	Impact on coral reefs
10:00 – 12:00	Healthy Reefs campaign
12:00 – 16:00	The ocean and Earth's processes
16:00 – 20:00	Blue Carbon
20:00 – 22:00	CCMI's Blue Carbon Offset Project
22:00 – 25:00	What can we do?
25:00 - 30:00	DearTomorrow campaign
30:00 – 32:00	Questions
32:00 – 35:00	Conclusion
35:00 – 40:00	Summary and goodbye

Necessary materials

- Internet connection
- Computer/phone
- Projector (optional)
- Speakers/headphones
- Scissors
- Notebook paper
- Pencils/pens
- Glue
- CCMI worksheets and/or booklet (one copy per student)
- Optional experiment materials (cup, vinegar, shell/eggshell)

Useful additional resources

- www.reefresearch.org/what-we-do/education/teacher-resources/
- www.reefresearch.org/what-we-do/education/reefs-go-live/
- Coral reef facts for kids! - National Geographic Kids (natgeokids.com)
- Blue Carbon Offset & Biodiversity programme (https://www.youtube.com/watch?v=QUuV-FWS-CE)
- Blue Carbon Offset & Biodiversity - CCMI (https://reefresearch.org/our-work/research/blue-carbon/)
- Blue carbon offset: How the ocean can combat climate change - Cayman Compass
- https://worldoceanday.org/

“Climate Change and our Ocean” Key Terms

The CCMI educators may refer to the following key terms throughout the live lesson. Listen carefully to the broadcast to learn some new vocabulary about corals and ecological terms in the ocean!

Blue carbon - carbon dioxide that is absorbed from the atmosphere and stored in the ocean

Calcium carbonate – colourless or white crystalline compound that naturally occurs in some plants and animals; it is the primary building block of many marine animals’ shells, including crabs, corals, sea snails, and bivalves

Carbon footprint - the total amount of carbon dioxide released into the atmosphere by all the actions of a person, a family, or a group.

Carbon offsetting – process of compensating for greenhouse gas emissions by investing in projects that reduce, avoid, or remove emissions elsewhere.

Carbon sink – reservoir where excess carbon from the atmosphere is stored

Climate change - change in global weather patterns over time, largely due to increased carbon dioxide in the atmosphere as the result of human activities

Mangrove – type of tropical tree or shrub that grows (in brackish or salt water) in thick clusters and sends out prop roots, which help to stabilise shorelines by keeping sediment in place; the root structures create a unique ecosystem where many marine and aquatic animals live

Ocean acidification – reduction in the pH of the ocean due to increased amounts of carbon dioxide in the atmosphere that are being absorbed and stored in the ocean

Seagrass - a grasslike flowering plant that lives in marine environments

Water cycle – movement of water through different reservoirs of the Earth and the atmosphere