

Cayman Climate Education – Secondary KS3 Introduction to "Climate Change in Cayman" Unit Overview

Unit Overview

Unit Title

Introduction to "Climate Change in Cayman"

Unit Rational: Why does this unit matter?

In an era marked by rapid environmental changes, understanding the implications of climate change is paramount. The Cayman Islands, like many regions, is at the forefront of experiencing these shifts, particularly with the connection between the atmosphere and oceans. This unit is designed to equip students with a comprehensive understanding of the intricate relationship between the atmosphere, oceans, and the unique context of the Cayman Islands. By delving into the local impacts of global phenomena, students will not only grasp the science behind climate change but also appreciate its real-world ramifications. This knowledge is crucial, fostering informed citizens who can make thoughtful decisions about sustainability, conservation, and community resilience in the face of global challenges. Through this unit, we aim to cultivate a sense of responsibility, curiosity, and empowerment, ensuring our students are well-prepared to navigate and contribute positively to the world they will inherit.

Unit Summary

This unit delves deep into the intricate dynamics of climate change, focusing on its effects on the atmosphere and oceans, particularly in the context of the Cayman Islands. Students will embark on a journey of discovery, differentiating between weather and climate, exploring the Greenhouse Effect, and understanding the profound impacts of rising ocean temperatures and acidification. Through hands-on activities, data analysis, and local connections, learners will witness the tangible consequences of climate change on their home, the Cayman Islands. From the mangroves to the coral reefs, and from daily weather patterns to extreme events, students will piece together the complex puzzle of how global changes manifest locally. By the end of the unit, students will not only have a solid scientific understanding of the risk that Cayman faces (18 of the most severe risks as listed in the 2021 Climate Change Risk Assessment by the Ministry of Sustainability & Climate Resiliency) but will also be equipped with the knowledge to advocate for sustainable practices and policies that can safeguard the Cayman Islands' future in a changing world.

The Cayman Islands National Curriculum AIMS

- Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics.
- Develop understanding of the nature, processes and methods of science through different types of science enquiries that help students answer scientific questions about the world around them.
- Equip students with the scientific knowledge required to understand the uses and implications of science, today and for the future.
- Enable students to become active participants in their own learning by helping to establish learning success criteria, understanding and













utilizing metacognitive strategies, critical thinking as well as using and responding to feedback from teachers and peers.

• Develop contextual knowledge of the location of globally significant places – both terrestrial and marine – and how these provide a geographical context for understanding the actions of processes.

The Cayman Islands National Curriculum Objectives

Chemistry Objectives

Earth and atmosphere

RELEVANT STATUTORY REQUIRMENTS:

- the carbon cycle
- the composition of the atmosphere
- the production of carbon dioxide by human activity and the impact on climate

Biology Objectives

Interactions and interdependencies - relationships in an ecosystem

RELEVANT STATUTORY REQUIREMENTS:

- the interdependence of organisms in an ecosystem, including food webs and insectpollinated crops
- the importance of plant reproduction through insect pollination in human food security
- how organisms affect, and are affected by, their environment, including the accumulation of toxic materials

Genetics and Evolution Objectives

REVELANT STATUTORY REQUIREMENTS:

 Changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction.

Geography Objectives

REVELANT STATUTORY REQUIREMENTS:

Understand, through the use of detailed place-based exemplars at a variety of scales, the key processes in:













- physical geography relating to continental drift and plate tectonics; rocks, weathering and soils; weather and climate, including climate change; and glaciation, hydrology and coasts. human geography relating to population and urbanisation; international development; economic activity in the primary, secondary, tertiary and quaternary sectors; and the use of natural resources understand how human and physical processes interact to influence, and change landscapes, environments and the climate; and how human activity relies on effective functioning of natural systems **Approximate Time Needed** 5 Lessons, each one lasting approximately 55 minutes, totalling 6 hours of instructional time. Post-it-Notes Supplies Markers Glue sticks Scissors Poster paper Poster boards Pens and pencils Printing paper **Internet Resources** National Trust Video Series Various links in provided in lesson plans. **Essential Questions:** What learning questions will prompt deeper exploration into the content, aligning with the enduring understanding? What is the difference between climate and weather? • What is the Greenhouse Effect? In what ways is the Greenhouse Effect impacting Earth's systems? •
 - How are humans impacting the Greenhouse Effect?
 - How does climate change affect the oceans?
 - How is climate change affecting climate and weather in Cayman?
 - How is climate change affecting Cayman's ocean?
 - What can we do about climate change?













Enduring Understandings:	Competencies:		
What key information will students learn in this unit? This includes both the main points from the curriculum and any basic knowledge they need to understand the unit's topics. Students will understand	What skills will students develop during this unit? List the specific skills or actions they'll be able to demonstrate by the end of the unit, based on the curriculum indicators. Students will be able to		
 The distinction between weather and climate, with a specific focus on the Cayman Islands' climate. The concept of the Greenhouse Effect and its role in driving climate change. The sources and impacts of CO₂ emissions, especially in relation to energy consumption. The effects of climate change on ocean temperatures, sea levels, and marine life. The significance of the Cayman Islands' geographical features, such as mangroves and coral reefs, in the context of climate change. The role of human activities in both causing and mitigating the effects of climate change. The importance of individual and collective actions in addressing climate change and its impacts. The interconnectedness of the atmosphere, oceans, and land in the global climate system. The potential consequences of climate change for daily life, seasonal patterns, and extreme weather events in the Cayman Islands. The value of data collection, analysis, and interpretation in understanding and addressing climate change. 	 Analyse and interpret data related to climate patterns and changes. Utilise geographical tools and resources, including maps and observations, to study local environmental features. Differentiate between various sources of CO₂ emissions and their impacts on the environment. Engage in critical thinking and discussion about the causes and effects of climate change. Collaborate in group activities and discussions to share ideas and solutions related to climate change. Apply knowledge of local ecosystems, such as mangroves and coral reefs, to broader climate change discussions. Evaluate the role of human activities in environmental changes and propose sustainable solutions. Communicate findings and ideas effectively through various mediums, including presentations, posters, and discussions. 		













Learning Plan

Outline of the structured sequence of teaching and learning experiences that will guide students towards achieving the unit's objectives.

	Lesson Title	Lesson Activities
1	What do we mean when we say, "the climate is changing"?	This lesson will introduce what 'climate change' means and the distinctions between weather and climate. This will be a chance for students to look at climate data and visualise how things have changed over the years.
2	What is causing the climate to change?	In this lesson, students will learn the basics of the Greenhouse Effect and carbon cycle and the impacts that humans have on them.
3	What is the history of the Earth's climate and how do we know?	In this lesson, students will explore the history of the Earth's climate and look at the importance of data collection for understanding and monitoring climate change over time.
4	How is climate change putting Cayman at risk now?	In this lesson, students will create posters while exploring the present-day impacts of climate change on the Cayman Islands.
5	How is climate change putting Cayman's future at risk?	In this lesson, students will take a deep dive into the 18 severe risks of the 2021 Climate Change Risk Assessment carried out by the Ministry of Sustainability and Climate Resiliency.

Ways to Show Learning: Formative and Self-Assessment

This unit does not have a final summative assessment so that all the lessons can be used individually as needed. However, there are other ways of assessing learning.

How else will students show what they've learned? This can be through their work, what they say or do, quizzes, writings, or other activities.

- 1. **Pre & Post Student Surveys:** This document can be printed out and completed before and after each lesson or each unit. This will gauge what students know and how they feel about climate change.
- 2. **Class Discussions:** Throughout the unit, students will engage in discussions on various topics, such as the Greenhouse Effect and its implications. Their active participation and the insights they share will highlight their understanding and engagement with the material.
- 3. **Hands-on Activities:** Activities like exploring ocean acidification will offer students a tangible way to grasp complex concepts. Their observations and interactions during these activities will provide insights into their comprehension levels.













- 4. **Reflections and Journal Entries:** After specific lessons or activities, students can be prompted to write reflections or maintain a journal. Their written thoughts will give a window into their internalization of the topics covered.
- 5. **Peer Feedback:** Throughout the unit, opportunities for peer interactions, such as sharing drafts or ideas, can be incorporated. The feedback they give and receive will be indicative of their grasp on the subject matter.
- 6. **Community Engagement:** With the unit taking place over an extended period of time, students can be encouraged to talk with their families and communities about what they learn. 'Homework' could be set to include family discussions based around the lessons in the unit their learning is then extended from the school into the home.





















