



# Cayman Climate Education – Primary KS2

## *Atmosphere Mini Unit Overview*

| Unit Overview   |
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| <b>Unit Title</b>   |
| How is Climate Change Impacting the Atmosphere, Oceans, and the Cayman Islands?   |
| <b>Unit Rationale: Why does this unit matter?</b>   |
| <p>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 inherit.</p> |
| <b>Unit Summary</b>   |
| <p>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 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.</p>                       |
| <b>The Cayman Islands National Curriculum AIMS</b>  |
| <ul style="list-style-type: none"> <li>• Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry, and physics.</li> <li>• Equip students with the scientific knowledge required to understand the uses and implications of science, today and for the future.</li> <li>• Encourage 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.</li> <li>• Develop the knowledge and skills which will help students make informed and reasoned decisions that result in responsible and active citizenship in a democratic society.</li> </ul>  |

- Ensure students are competent in the geographical skills needed to collect, analyze, and communicate with a range of data gathered through experiences of fieldwork that deepen their understanding of geographical processes.
- Interpret a range of sources of geographical information, including maps, diagrams, globes, aerial photographs, and Geographical Information Systems (GIS).
- Foster students' awareness of global issues affecting life in the 21st century.

### The Cayman Islands National Curriculum Objectives

#### Living Things and Their Habitats

- Recognise that environments can change and that this can sometimes pose dangers to living things.

#### Geography and the Environment

- Name and locate the islands in the Caribbean and their capitals, geographical regions and their identifying human and physical characteristics, key topographical features (including mangroves, coral reefs, hills, mountains, coasts and rivers), and land-use patterns; and understand how some of these aspects have changed over time.
- Differentiate weather and climate and describe appropriate safety procedures during bad weather.
- Identify and explain local and global environmental problems and individual roles in minimizing them.

#### Approximate Time Needed

8 lessons, each lasting approximately 45 minutes, totalling 6 hours of instructional time.

#### Supplies

- Teacher Computer
- Class Projector
- Presentation slides for various lessons
- Worksheets for various lessons
- Markers
- Poster or Large Paper
- Two identical cups of water
- Glass Jars with lids
- Ice cubes
- Thermometers
- Tupperware container
- Raised platform (yogurt cups, jello cups etc)
- Vinegar
- Seashell or Coral Piece (for demonstration)

#### 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:

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...*

- *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 CO<sup>2</sup> 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.*

### Competencies:

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...*

- *Analyse and interpret data related to climate patterns and changes.*
- *Utilize geographical tools and resources, including maps and observations, to study local environmental features.*
- *Differentiate between various sources of CO<sup>2</sup> 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.*

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| <ul style="list-style-type: none"> <li>• The importance of individual and collective actions in addressing Climate Change and its impacts.</li> <li>• The interconnectedness of the atmosphere, oceans, and land in the global climate system.</li> <li>• The potential consequences of Climate Change for daily life, seasonal patterns, and extreme weather events in the Cayman Islands.</li> <li>• The value of data collection, analysis, and interpretation in understanding and addressing Climate Change.</li> </ul> | <ul style="list-style-type: none"> <li>• Evaluate the role of human activities in environmental changes and propose sustainable solutions.</li> <li>• Communicate findings and ideas effectively through various mediums, including presentations, posters, and discussions.</li> </ul> |
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## 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   |
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| 1.1 | What is the difference between Climate and Weather?                                    | In this introductory lesson, students will delve into the fundamental differences between climate and weather. Using Cayman-specific examples, they will engage in a sorting activity, distinguishing between characteristics of weather and climate. The lesson aims to establish a foundational understanding of these concepts, setting the stage for deeper exploration in subsequent lessons.                                |
| 2.1 | What is the Greenhouse Effect?   | Students will be introduced to the concept of the Greenhouse Effect and its pivotal role in climate change. Through a hands-on activity, they will simulate the greenhouse effect, observing the impact of trapped heat. This tangible experience will not only illustrate the science behind the phenomenon but also emphasize its significance in the context of global warming.  |
| 2.2 | How are Human Activities Amplifying the Greenhouse Effect's Impact on Earth's Systems? | Building on their understanding of the greenhouse effect, students will explore the sources and implications of increased CO <sup>2</sup> in the atmosphere. They will engage in activities that highlight energy consumption and its contribution to CO <sub>2</sub> emissions. By analysing climate maps and vegetation patterns, students will predict potential changes in various global regions due to rising temperatures. |

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| 2.3 | How does Climate Change affect the oceans?                     | This lesson shifts the focus to the oceans, a crucial component of the global climate system. Students will construct a systems map, linking the atmosphere to the oceans, and delve into the consequences of increased atmospheric CO <sup>2</sup> on ocean temperatures, acidification, and sea levels. Through guided discussions and activities, they will gain insights into the intricate interplay between the atmosphere and the oceans.   |
| 3.1 | How is Climate Change affecting Climate and Weather in Cayman? | Zooming in on the Cayman Islands, students will explore the localized effects of Climate Change. Through station-based activities, they will investigate changes in atmospheric temperatures, everyday weather patterns, seasonal variations, and extreme weather events. This lesson aims to make the global issue of Climate Change more relatable by focusing on its impact on the students' immediate environment.   |
| SP1 | What can we do?  | In this culminating project, students will consolidate their learning by addressing the overarching question: "What can we do?" They will reflect on the various facets of climate change explored throughout the unit and brainstorm actionable steps to mitigate its effects. The project will emphasize the role of individual and collective action in combating climate change, empowering students to become proactive agents of change.   |
| SP2 | Visualizing Climate Change's Impact on Cayman                  | Utilizing a system thinking approach, students actively engage in creating a scaffolded infographic based on the understanding they have gained over the course of this unit. This will focus on the impact of Climate Change on The Cayman Islands and action-oriented suggestions to mitigate these impacts. This hands-on, open-ended student-centred activity promotes critical thinking as they delve into issues like ocean acidification, coral health, and sea level changes. The lesson's experiential component, a gallery walk, fosters peer-to-peer learning and collaborative discussion, reinforcing their grasp on the global implications of climate shifts. |





- **Solution-Oriented Thinking:** By the end of the assessment, students will be able to propose and illustrate actionable measures that can mitigate the adverse effects of climate change.
- **Effective Communication:** Students will be adept at articulating their understanding, explaining the content of their infographics, qualifying and justifying their choices and representations.
- **Feedback Reception:** Through peer feedback during the gallery walk, students will gain an understanding of areas of strength and potential gaps in their representation, fostering a continuous learning environment.

### Assessment Criteria

#### Standards & Criteria for Success

##### Understanding of Key Concepts:

- Shows they know what words like "Greenhouse Effect" and "Ocean Acidification" mean.
- Can talk about how these big ideas might change things in the Cayman Islands.

##### Infographic Design and Organization:

- Uses the map of the Cayman Islands in the middle of their poster.
- Puts pictures or drawings on the map to show where climate change might cause problems.
- Makes sure the poster is neat, colourful, and easy to understand.

##### Application of Key Concepts:

- Draws or shows how the weather and sea are different because of climate change in the Cayman Islands.
- Talks about how the big changes in the world's climate can make things different in the Cayman Islands.
- Uses arrows to suggest links and systems of different individual components.

##### Solution-Oriented Thinking:

- Think of ways we can help make things better or stop them from getting worse.
- Put these ideas in the three squares on their poster.

##### Communication and Presentation:

- Clarity in conveying complex ideas through visuals and text.
- Ability to justify or explain choices made during the creation of the infographic when discussing with peers, adults or educators.

##### Creativity:

- Uses own drawings, symbols, and words to help explain the big ideas.

- Adds their own special touch or idea to the poster.

### Additional Ways to Show Learning: Formative and Self-Assessment

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

1. **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.
2. **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.
3. **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.
4. **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.
5. **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 talking activities, based around the lessons in the unit, with their families - their learning is extended from the school into the home.