Lift-Off

Climate Change

Objectives

You will be able to

- Describe climate change, its causes, and its effects.
- Ask questions about climate change.
- Rephrase and build on others' ideas during group discussion.
- Identify and connect vocabulary concepts.
- Build on what others say to help strengthen your understanding of cause and effect relationships.

How do we know human activity is influencing climate, and what can we do about it?

Evaluation and Feedback

To evaluate your work, you will

- Use the "Asking Questions and Defining Problems" row of the Science and Engineering Practices Rubric.
- Use other criteria determined by your teacher.

Lift-Off Task: What Is Climate Change, and Why Do We Care about It?

As a group:

- Watch three video clips about climate change.
- Decide on some causes and effects of climate change.
- Define *climate change*.
- Generate a list of need-to-know questions to address climate change.
- Construct a concept map of climate change concepts.

Vocabulary

- carbon dioxide (CO_2)
- cause
- climate
- climate change
- effect
- greenhouse gases
- temperature
- weather
- *x*-axis
- *y*-axis

Connect to the Culminating Project

Organize your thoughts about the problem you are addressing for the school board by considering these questions:

- What is climate change?
- Why is it a problem?
- What questions do you still need to explore to get to a good solution?

What Is Climate Change, and Why Do We Care about It?

Introduction

In the last unit, you learned about weather. In this unit, you will focus on climate, which is the weather conditions in an area over a much longer period of time—decades rather than hours or days. Scientists have discovered that in the last decade, the world's climate is changing at a dangerous rate. Today you will explore what climate change is, why it matters, and what you need to know more about in order to help.

Part I • What Is Climate Change and Why Does It Matter to Us and the World?

1. Look at the pictures on the slides and write down what you observe.

2. Turn and talk to your group members about what you saw. What do you think these images show?
3. What does the graph tell you about climate change over time?
    - How many years does this graph show (*x*-axis)? _____
    - What is this graph measuring over time (*y*-axis)? _____
    - Conclusion: Has temperature increased or decreased since 1880? How do you know?
4. Watch the two video clips about climate change. (If you are watching the videos in small groups, click on the links below. Otherwise, watch the videos that your teacher shows.)
    - *What Is Climate Change?* (cause and effects of climate change in Australia): https://youtu.be/ko6GNA58YOA (2:37)
    - *Climate Change* (according to a kid): https://youtu.be/Sv7OHfpIRfU (2:11)
5. After watching the video clips, discuss with your group three **causes and effects** of climate change. Record your answers in the table below.

	1	2	3
Causes	⇩	⇩	⇩
Effects			

6. With your group, discuss and come up with your own definition of *climate change*.

Part II • What Do You Need to Know in Order to Help?

1. Throughout this unit you will work on a Culminating Project. The goal of the project is to solve this problem: A school board is looking for proposals to reduce their school's impact on climate change, and they need your help.
2. Watch the following video clip about a group of students who started a Green Team at their middle school to design and implement solutions to help reduce climate change. (If you are watching the video in small groups, click on the link below. Otherwise, watch the video that your teacher shows.)
    - *Dreaming in Green*: http://youngvoicesonclimatechange.com/movie_dreaming.php (6:22)
3. With your group, make a list of questions that you still need to explore before you are ready to put together a plan for the school board. In other words, what do you still need to know about climate change?

Part III • Understand Climate Change

Over the course of this unit, you will discover many complex **cause and effect** relationships related to climate change. You need a way to keep track of all these relationships.

1. Individually, take a few minutes to make a bulleted list of everything you know about climate change. Just write out your ideas as they come to you; you don't need to use science words. You might want to include:

    - Causes of climate change
    - Effects of climate change

2. As a group
    - Discuss what each member wrote on their list.
    - On a large piece of poster paper
        - Highlight the ideas that were the same across all the group members.
        - Circle the ideas suggested by just one member of the group.
        - Write a "?" in front of any ideas that your group is not sure about.
    - Display your group poster on the wall.
    - Walk around and look at each group's posters.

3. As a whole class
    - Construct a class concept map that starts with the concept "climate change" in the center.
        - Decide which key words (concepts) you want to include on the concept map.
        - Draw lines with arrows between two key words (concepts) to indicate that there is a relationship.
        - Write connecting words to describe the relationships between the key words (concepts) on the concept map.
        - Make as many connections as you can between the concepts on the concept map.
    - It is important for everyone to share their ideas, and it is okay if you don't agree.
    - You will be returning to this concept map to revise and add new information as you learn more about climate change.

Reflect

1. At the beginning of this task, you wrote down what you observed about the pictures on the slides. Look back at your observations. Consider what you learned from the graph, videos, your peers. How can you add to your observations? What details did you not include at first? Use the information you recorded in the cause and effect table and the class concept map to help you.

2. In this unit, you will be focusing on the concept of **cause and effect**, or how one event can lead to another. Give one example of how this concept came up in today's task.

Part IV • Connect to the Culminating Project and Assessment

Complete the Individual Project Organizer for this task.