



# INVESTIGATING CLIMATE CHANGE

Take a deeper dive into the causes and science of climate change.

**Grade Level:** 6-12 | **Duration:** 1-2 class periods

## Students Will Be Able To:

- Explain the greenhouse effect and its role in climate change
- Identify the primary greenhouse gases and understand how they contribute to climate change
- Explain the impact of human versus natural causes related to climate change

## Materials Needed:

- Paper
- Pencils or pens
- Discussion cards
- Investigating Greenhouse Gases worksheet

## In the Teachers Guide

- Greenhouse Effect
- Carbon Cycle
- Greenhouse Gases
- Human Activities vs. Natural Causes
- Climate Change Indicators
- Carbon Footprint
- Climate Data Research Methods

## Exploring Climate Change

## LESSON 2



## RESOURCES

### Articles

- [Basics of Climate Change](#)
- [Causes of Climate Change](#)
- [Which Emits More Carbon Dioxide: Volcanoes or Human Activities?](#)
- [Overview of Greenhouse Gases](#)
- [Climate Change Indicators](#)
- [Carbon Footprint Calculator](#)

### Videos

- [The Greenhouse Effect](#)
- [How Carbon Affects Nearly Everything on Earth – Including Our Future](#)

# INVESTIGATING CLIMATE CHANGE

Take a deeper dive into the causes and science of climate change.

## 1 ENGAGE:

1. Discuss with students what they learned in the previous lesson.
2. Encourage students to ask questions they may have and discuss as a class.
3. Explain that this next lesson will delve deeper into the science behind climate change and its causes.

## 2 EXPLORE:

1. Ask students to describe the greenhouse effect in their own words.
2. Show the videos “The Greenhouse Effect” and “How Carbon Affects Nearly Everything on Earth.” Allow time for class discussion.
3. Emphasize the natural process of the greenhouse effect and its recent impact due to increased greenhouse gas emissions. Highlight how carbon dioxide is released through both natural processes and human activities.

## 3 EXPLAIN:

1. Provide students with the article “Which Emits More Carbon Dioxide: Volcanoes or Human Activities?” and discuss its key points.
2. Emphasize the significant impact of human activities, particularly the burning of fossil fuels, on greenhouse gas emissions and climate change.



Use the discussion cards to further conversations.

## 4 ELABORATE:

1. Divide students into groups and assign each group a specific greenhouse gas (carbon dioxide, methane, nitrous oxide, chlorofluorocarbons).
2. Have groups conduct research and read the article “Overview of Greenhouse Gases.” Use the provided worksheet to aid discussions.
3. Bring students back together as a large group to give overviews of each greenhouse gas. Have students share how the gases contribute to climate change, and ask them to suggest emission reduction strategies.



Use the Investigating Greenhouse Gases worksheet to aid student research.

## 5 EVALUATE:

1. Invite students to investigate their family's carbon footprint using the U.S. Environmental Protection Agency's carbon footprint calculator.
2. Ask students to discuss ways they can reduce their greenhouse gas emissions with their families.
3. Provide an opportunity for students to share their findings and reflections with the class, as well as any commitments their families have made to reduce their carbon footprint.

## CLOSURE OR EXIT TICKET:

Reflect on this lesson about the greenhouse effect and human impacts on climate change. Summarize the key points, including the role of human activities in greenhouse gas emissions and potential strategies for reducing the carbon footprint within your family.

# INVESTIGATING CLIMATE CHANGE

**Discussion Cards:** Use these questions to prompt discussions and encourage students to think critically about climate change and its implications.



Describe the greenhouse effect in your own words.



What are some natural processes that contribute to greenhouse gas emissions?



How do human activities, such as burning fossil fuels, impact greenhouse gas emissions?



Can you name some greenhouse gases other than carbon dioxide? What are their sources?



How do different greenhouse gases contribute to climate change?



What are some strategies individuals and families can adopt to reduce their carbon footprint?



How do you think your family's carbon footprint compares to the national average?



Share one commitment your family can make to reduce greenhouse gas emissions.

# INVESTIGATING CLIMATE CHANGE

**Discussion Cards:** Use these questions to prompt discussions and encourage students to think critically about climate change and its implications.



Why is it important for us to understand the greenhouse effect?



How do greenhouse gas emissions affect global temperatures?



What are some potential consequences of climate change?



How can renewable energy sources help mitigate climate change?



What are the main challenges in reducing greenhouse gas emissions globally?



How can changes in agricultural practices help reduce greenhouse gas emissions?



Share one lifestyle change you could make to decrease your carbon footprint.



How do greenhouse gas emissions impact wildlife and ecosystems?



# INVESTIGATING GREENHOUSE GASES

Explore different types of greenhouse gases and the impact they have on the environment.

**Directions:** Complete the graphic organizer with your research about the greenhouse gas you were assigned. Use this organizer to record the information you will present to your classmates.

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Greenhouse gas we are researching:

What are the sources of this greenhouse gas?

How has this greenhouse gas changed over time in the atmosphere?

How does this greenhouse gas contribute to climate change?

How can people reduce emissions of this greenhouse gas?

Any other interesting facts about this greenhouse gas?