



# Climate Change

6th Grade

*Science*

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## **BIG IDEAS**

Climate change is a significant and long-term change in the weather patterns on Earth. Human activities, as the emission of greenhouse gases, are major contributors to climate change.

Understanding climate data helps us make informed decisions to mitigate and adapt to climate change

## **EDUCATION STANDARDS**

### **NGSS Performance Expectation(s)**

- MS-ESS3-5: Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.

### **Science and Engineering Practices**

- Analyzing and Interpreting Data
- Engaging in Argument from Evidence

### **Disciplinary Core Ideas**

- ESS3.D: Global Climate Change

### **Crosscutting Concepts**

- Stability and Change
- Cause and Effect

### **Common Core State Standards**

- ELA/Literacy RST.6-8.1: Cite specific textual evidence to support analysis of science and technical texts.
- Math 6.SP.B.5: Summarize numerical data sets in relation to their context.

### **ITEEA Standards**

- Standard 13: Assess the impact of products and systems.

## **MEASURABLE STUDENT LEARNING OBJECTIVES**

- Students will be able to explain the key factors contributing to climate change.

- Students will be able to interpret climate data and graphs.
- Students will be able to discuss potential solutions and actions to mitigate climate change.

### **STEM INTEGRATION**

- **Science:** Understanding the causes and effects of climate change.
- **Technology:** Using NASA data and digital tools to analyze climate data.
- **Math:** Summarizing and interpreting numerical climate data.
- **Art:** Creating infographics and visual presentations of climate data.

**NATURE OF STEM** This lesson integrates science, technology, engineering, and mathematics to provide a good understanding of climate change. It uses real-world data and digital tools to analyze and interpret climate information, aiding the development of critical thinking and problem-solving skills.

### **MATERIALS NEEDED**

Computers with internet access  
 Projector  
 NASA climate data sets  
 Graph paper  
 Markers  
 Infographic software (Canva, Piktochart AI...)

**ENGAGING CONTEXT/PHENOMENON** Begin the lesson with a short video from NASA that highlights the effects of climate change on Earth's systems, like "[How We Know What We Know about Climate Change.](#)"

**DATA INTEGRATION** Students will analyze NASA climate data, including [global temperature records](#), [carbon dioxide levels](#), and [ice melt data](#). They will create graphs and charts to visualize trends and make predictions about future climate scenarios.

**TEACHER BACKGROUND KNOWLEDGE** Teachers should understand the basic science of climate change, including greenhouse gases, the greenhouse effect, and the role of human activities.

**DIFFERENTIATION OF INSTRUCTION** Provide scaffolding for students who need additional support with data analysis. Offer advanced students with opportunities to explore more complex climate models. Use visual aids and hands-on activities to cater to different learning styles.

**REAL-WORLD CONNECTIONS FOR STUDENTS** Discuss how climate change impacts local and global communities. Involve students in a project to assess their carbon footprint and develop action plans to reduce it. Highlight current events and policies related to climate change.

### **INTEGRATION POSSIBLE MISCONCEPTIONS**

- Misconception: Climate change is the same as weather.

Correction: Explain the difference between short-term weather patterns and long-term climate trends

- Misconception: Human activities do not significantly impact climate change.  
Correction: Present evidence of the correlation between human activities and rising greenhouse gas levels.

## **LESSON PROCEDURE**

### **Engage**

*Procedure:* Show a NASA video on climate change. Discuss students' prior knowledge and questions.

*Modifications:* Use captions for hearing-impaired students. Provide a transcript of the video.

*Standards Addressed:* MS-ESS3-5, RST.6-8.1

*Formative/Summative Assessments:* Initial discussion and question session.

*Resources:* Video: [How We Know What We Know about Climate Change.](#)” from NASA;  
Transcript of the video

### **Explore**

*Procedure:* Students analyze NASA climate data sets, create graphs, and identify trends.

*Modifications:* Provide step-by-step instructions and visual aids.

*Standards Addressed:* MS-ESS3-5, 6.SP.B.5

*Formative/Summative Assessments:* Observation and data analysis sheets.

*Resources:* NASA climate data sets (e.g., temperature records, CO2 levels); Graph paper;  
Computers with internet access

### **Explain**

*Procedure:* Facilitate a class discussion on the data analysis results. Explain the greenhouse effect and its impact on climate.

*Modifications:* Use visual aids and provide note-taking templates.

*Standards Addressed:* MS-ESS3-5, RST.6-8.1

*Formative/Summative Assessments:* Class discussion and student explanations.

*Resources:* Diagrams of the greenhouse effect; whiteboard and markers.c

### **Elaborate**

*Procedure:* Students create infographics to present their findings on climate change and suggest solutions.

*Modifications:* Offer templates and graphic organizers.

*Standards Addressed:* MS-ESS3-5, RST.6-8.1

*Formative/Summative Assessments:* Infographics and presentations.

*Resources:* Infographic creation software (e.g., Canva); computers with internet access.

### **Evaluate**

*Procedure:* Assess students' knowledge through a quiz and a reflective essay on the importance of addressing climate change.

*Modifications:* Provide different formats for the quiz (written, oral) based on student needs.

*Standards Addressed:* MS-ESS3-5

*Formative/Summative Assessments:* Quiz and essay.

*Resources:* Quiz sheets; rubric for essay.

## **REFERENCES**

- NASA Climate Change: Vital Signs of the Planet. Retrieved from [NASA Climate Change](#)
- National Geographic Society. (n.d.). Understanding Climate Change. Retrieved from [National Geographic](#)
- Project Learning Tree. (n.d.). Climate Change Activities. Retrieved from [PLT](#)
- U.S. Global Change Research Program. (n.d.). Climate Science Special Report. Retrieved from [USGCRP](#)