



A PROGRAM OF GEORGIA COMMUTE OPTIONS

Global Climate Dynamics

Georgia Commute Schools 6th - 8th Lesson Plan

Lesson Background

Grades: 6th-8th

Length of Lesson: Three class periods, approximately 45 minutes each

Materials:

- ➔ Paper
- ➔ Masking or painter's tape
- ➔ A marker
- ➔ Computers with access to the Internet

Student Handouts:

- ➔ Handout 1: Global Temperatures and Carbon Dioxide
- ➔ Handout 2: Greenhouse Effect Computer Simulation
- ➔ Handout 3: Climate and Health - Making Sense of Human Impacts
- ➔ Handout 4: Ways to Reduce Greenhouse Gas Emissions

Throughout this document, you will see items highlighted in various colors to indicate alignment to specific standards. Each color corresponds to a different framework component—**Disciplinary Core Ideas (DCIs)**, **Science and Engineering Practices (SEPs)**, **Crosscutting Concepts (CCCs)**, or **Georgia Health Standards**. Highlighted text may appear in directions, prompts, or other instructional text to help quickly identify where these standards connections occur throughout the lesson.



EDUCATION STANDARDS

Anchoring Phenomenon	Global temperature changes
Georgia Standards of Excellence	<p>S6E4: Obtain, evaluate, and communicate information about how the sun, land, and water affect climate and weather.</p> <p>S6E6: Obtain, evaluate, and communicate information about the uses and conservation of various natural resources and how they impact the Earth.</p> <p>S7L4.c: Analyze and interpret data to provide evidence for how resource availability, disease, climate, and human activity affect individual organisms, populations, communities, and ecosystems.</p>
Next Generation Science Standards	<p>Performance Expectation: MS-ESS3-5. ESS3-5. Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.</p> <p>Science and Engineering Practices (SEPs): Asking Questions and Defining Problems Ask questions to identify and clarify evidence of an argument. Appendix F Science and Engineering Practices in the NGSS, page 4</p> <p>Disciplinary Core Ideas (DCIs): ESS3.D Global Climate Change Human activities, such as the release of greenhouse gases from burning fossil fuels, are major factors in the current rise in Earth's mean surface temperature (global warming). Reducing the level of climate change and reducing human vulnerability to whatever climate changes do occur depend on the understanding of climate science, engineering capabilities, and other kinds of knowledge, such as understanding of human behavior and on applying that knowledge wisely in decisions and activities. Appendix E - Progressions within the Next Generation Science Standards, page 4</p> <p>Crosscutting Concepts (CCCs): Stability and Change Stability might be disturbed either by sudden events or gradual changes that accumulate over time. Appendix G - Crosscutting Concepts, pages 10 & 17</p>
Reading & Writing Skills	<p>Reading Skills:</p> <ul style="list-style-type: none"> ➤ Interpret graphs and time-series visualizations of temperature and CO₂ levels. ➤ Compare multiple data sources (simulations, handouts, and videos) to identify trends and patterns. ➤ Determine the meaning of key vocabulary in context. ➤ Distinguish between correlation and causation when examining temperature vs. CO₂ data. <p>Writing Skills:</p> <ul style="list-style-type: none"> ➤ Use sentence stems to construct evidence-based explanations of observed patterns. ➤ Develop testable questions and short research prompts during the simulation phase. ➤ Summarize simulation findings and cause-and-effect relationships. ➤ Reflect in writing on how human activities influence environmental stability and health.
Health & Physical Education Standards	HE6.5.g : Predict the outcomes of a health-related decision.

Big Idea: Greenhouse Effect and Global Climate Dynamics

Overview

Students will learn how the greenhouse effect is related to global climate change. Students will learn how increased greenhouse gas emissions from human activities have contributed to increased global surface temperatures. Students will also learn how to reduce greenhouse gas emissions in the transportation sector.

Vocabulary

The vocabulary section of a lesson plan provides key terms and definitions that support student comprehension and engagement with the lesson content. Teachers can reference this section to introduce new words during instruction, reinforce understanding through activities, or provide background information to support differentiated learning.

Climate: The average weather (usually taken over 30 years) for a particular region and time period; the average pattern of weather for a particular area; climatic elements include precipitation, temperature, humidity, sunshine, wind velocity, and phenomena, such as fog, frost, and hailstorms.

- ➔ **Global Climate Change:** The change in long-term weather patterns; changes can cause warmer or colder temperatures; annual amounts of rainfall or snowfall can increase or decrease.
- ➔ **Global Warming:** Refers to an average increase in the Earth's temperature, which in turn causes changes in climate; a warmer Earth may lead to changes in rainfall patterns, a rise in sea level, and a wide range of impacts on plants, wildlife, and humans.
- ➔ **Greenhouse Effect:** The effect produced as greenhouse gases allow energy from the sun to pass through the Earth's atmosphere, but prevent most of the outgoing heat from the surface and lower atmosphere from escaping into outer space.
- ➔ **Greenhouse Gas:** Any gas that absorbs the sun's heat in the atmosphere, including water vapor, carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), halogenated fluorocarbons (HCFCs), ozone (O₃), perfluorinated carbons (PFCs), and hydrofluorocarbons (HFCs).
- ➔ **Emissions:** Something being released, or let out, especially into the air.
- ➔ **Urban heat island:** An urban heat island is a city or neighborhood that gets hotter than the areas around it because there are more buildings, roads, and concrete that trap heat from the sun. Places with lots of trees, grass, and open land stay cooler because plants provide shade and release moisture into the air.



Engage: What factors explain the trend in global temperatures over the past century? (25 minutes)

1. Go to <https://climate.nasa.gov/interactives/climate-time-machine/>, click on Global Temperature and play the color-coded progression of **global surface temperatures since 1884**.
2. Prompt students to record observations and **identify questions they have about this dataset** in their **Student Handout 1: Global Temperatures and Carbon Dioxide** using the notice and wonder chart.



STUDENT SUPPORT

Scaffolding for Additional Support

For students who may need additional support, consider using these questions to scaffold student learning:

- What colors do you notice changing on the map?
- What happens to red areas over time?
- What do you wonder about why these changes are happening?

3. Then, click on Carbon Dioxide and play the time series **showing global changes in the concentration and distribution of carbon dioxide since 2002**.
4. Prompt students to **generate a list of questions about how global temperature increases and carbon dioxide concentrations are related** and record them in their **Student Handout 1: Global Temperatures and Carbon Dioxide**.
5. Guide a discussion where students can share their noticings and **the questions they have**. Use the questions below to help guide discussion and **elevate students' asking deeper questions as they develop an understanding**.
 - Observing Patterns
 - » What do you notice about the levels of carbon dioxide over time?
 - » Do you see any patterns or trends in the maps or graphs?
 - Making Connections
 - » How do the changes in carbon dioxide compare to the changes in global temperature you observed earlier?
 - » Why do you think carbon dioxide levels might affect temperature?
 - Thinking Deeper
 - » What might cause carbon dioxide levels to go up or down in different regions?
 - » If carbon dioxide keeps increasing, what do you think could happen to global temperatures in the future?



➤ Encouraging Curiosity

- » What questions do you have after looking at this data?
- » What else would you like to know to better understand how carbon dioxide and temperature are connected?

Remind them that the goal is to learn enough during the lesson to answer these questions.



Explore 1: Greenhouse Effect Kinesthetic Demonstration (25 minutes)

6. Clear a space in your classroom or find a space large enough for the students to walk around. In nice weather, consider setting up an outdoor space.



STUDENT SUPPORT

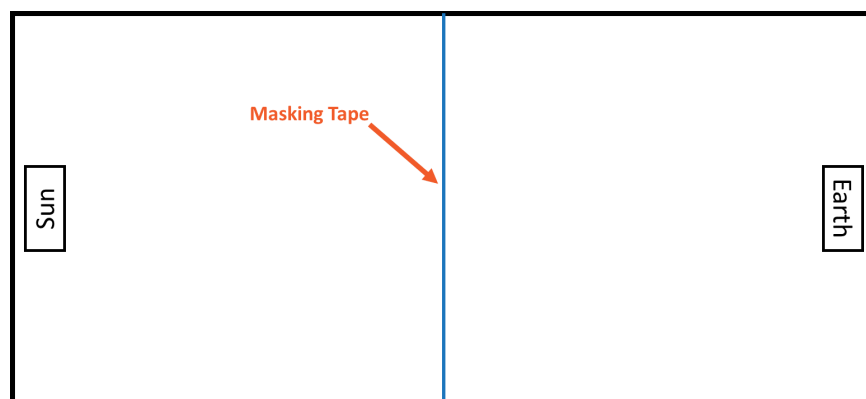
Make it More Engaging

To make this activity more robust and increase opportunities for physical movement, consider partnering with your physical education department. You can also modify this experience to have the infrared light students run to avoid getting tagged, and allow the greenhouse gas students to move laterally along the atmosphere line. This version works best outdoors or in a space with plenty of room. To avoid collisions, you might give each greenhouse gas student a specific section of the line to use.

Other alternatives for increasing student excitement about the activity might include:

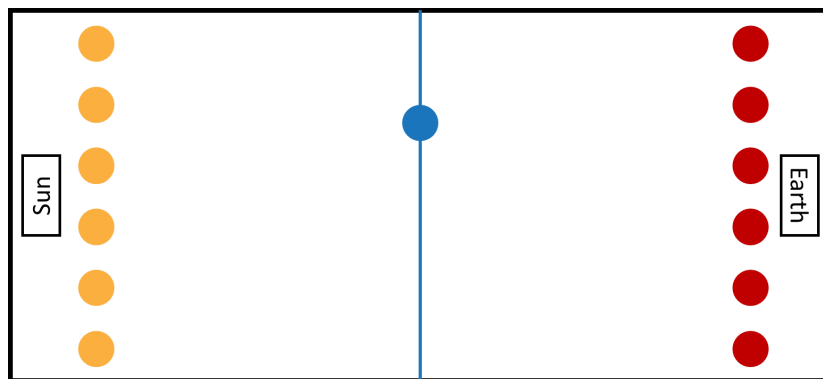
- ➔ Provide students with different roles with unique colored vests to increase understanding.
- ➔ Using color-coded cards or props (balls, beanbags, or labeled tokens) that represent resources, gases, or energy.
- ➔ Creating character cards for students to use and/or share as they move throughout the classroom space.

7. Set up the classroom as follows (shown in the diagram below):
 - ➔ Write "Earth" in large letters on one piece of paper, and "Sun" on another. Tape these signs on opposite walls. (For students who are developing language skills, you may also consider drawing a picture of the Earth and Sun to accompany the words.)
 - ➔ Use the masking tape to make a line on the ground about halfway between the two walls. Write on the masking tape "Earth's Atmosphere". Then explain to students that this line represents the Earth's atmosphere.

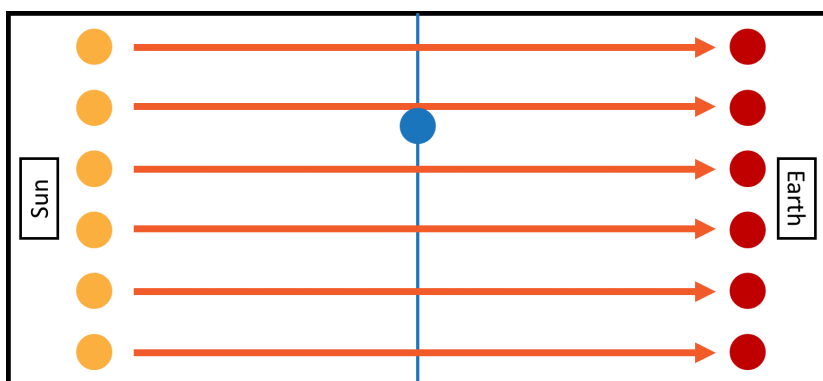




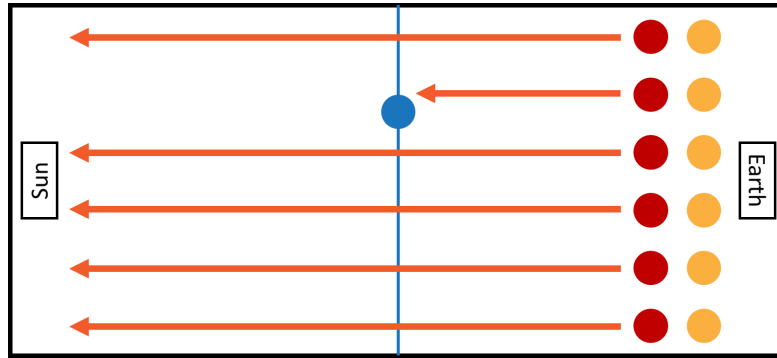
8. Divide the class into three groups. Explain that these groups will represent sunlight, infrared light, and greenhouse gases. Make sure the greenhouse gas group has fewer students than the other two groups. For example, in a class of 15 students, the sunlight and infrared light groups could have six students each, while the greenhouse gas group could have three students.
9. Have the students line up in the following way (shown in diagram):
 - The sunlight and infrared light groups should line up evenly on the sun and Earth walls, respectively.
 - For the first demonstration, have only one student from the greenhouse gas group anywhere along the atmosphere line.



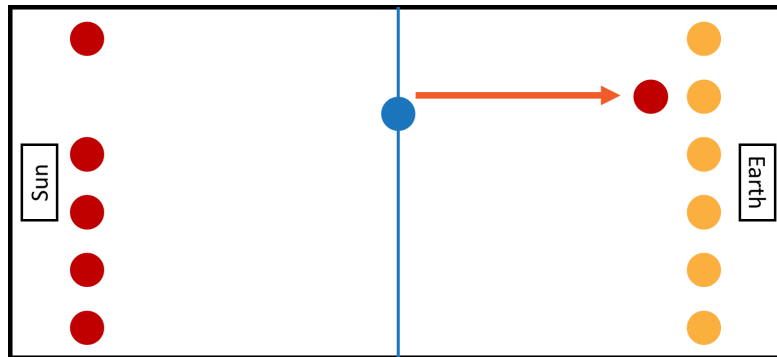
10. Explain the procedure to the students (shown in the diagrams):
 - On "Go", the sunlight students will walk in a straight line from the Sun to the Earth (it's not a race, so they just need to walk).
 - The greenhouse gas student cannot interfere with the sunlight students (because greenhouse gases do not affect incoming sunlight).



- Once they reach the Earth, the sunlight students should "tag in" the infrared light student that they started across from. The sunlight students should now wait at the Earth.
- Once "tagged in", the infrared light students must now walk in a straight line towards the Sun.
- The greenhouse gas student can now extend their arms in an attempt to tag the infrared light students. But the greenhouse gas student must stay rooted to the same spot (i.e. they cannot move their feet, but can reach with their arms).



- Any infrared light students that get tagged by the greenhouse gas student must turn around and head back to the Earth. The other infrared light students should continue to the Sun. During this first demonstration, there will be only one or two students who get tagged.



11. Count the number of infrared students who made it to the Sun wall. Then, repeat the demonstration, each time adding more greenhouse gas students. Ideally, with the final demonstration, there should still be a few infrared students who make it through to the Sun.



HEALTH AND PHYSICAL EDUCATION CONNECTION

This activity ties to HE6.5.g - Predict the outcomes of a health-related decision. As students move and interact, they can observe how different actions (movement patterns, positioning) affect outcomes, similar to predicting the effects of health-related choices. Using a kinesthetic approach, students practice thinking ahead about cause and effect, just like they would when making real-life health decisions.

12. Return to the questions from the Engage section. Have students look at the questions they generated when exploring global temperature and carbon dioxide data. Ask them to identify any questions they can now answer after participating in the kinesthetic greenhouse effect demonstration.

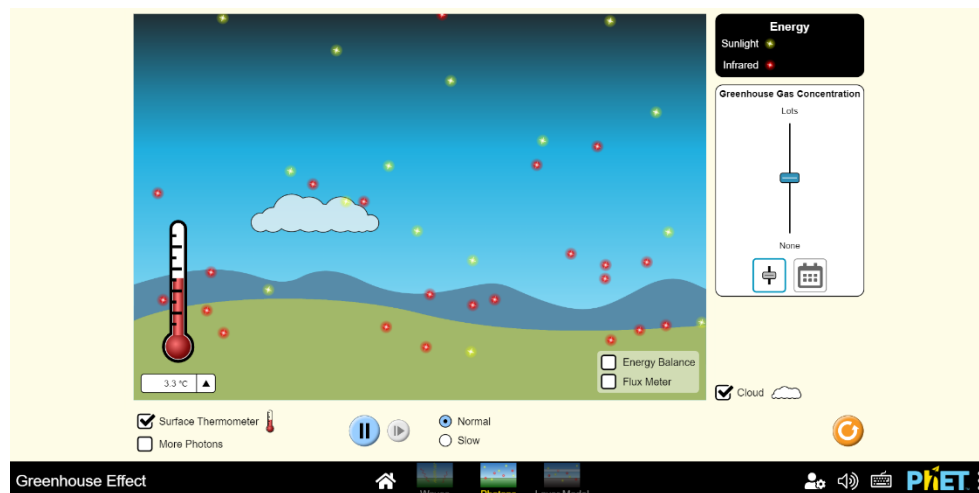


13. Facilitate a class discussion. Use the following prompts to guide the conversation:
 - What happened to the infrared light students when there were more greenhouse gas students?
 - How did the movement of greenhouse gas students affect how many infrared light students made it to the Sun wall?
 - How does this activity help you understand how greenhouse gases trap heat in Earth's atmosphere?
 - Why do you think some infrared light "escaped" while others were reflected back to Earth?
 - What would happen if the number of greenhouse gas students kept increasing?
 - How does this simulation relate to what is happening in our real atmosphere with rising greenhouse gas concentrations?
14. At the closing of the discussion, reinforce key concepts. Make sure students understand:
 - Infrared light doesn't always travel straight back to space—it can be reflected in random directions.
 - More greenhouse gases mean more heat is trapped, leading to higher global temperatures.

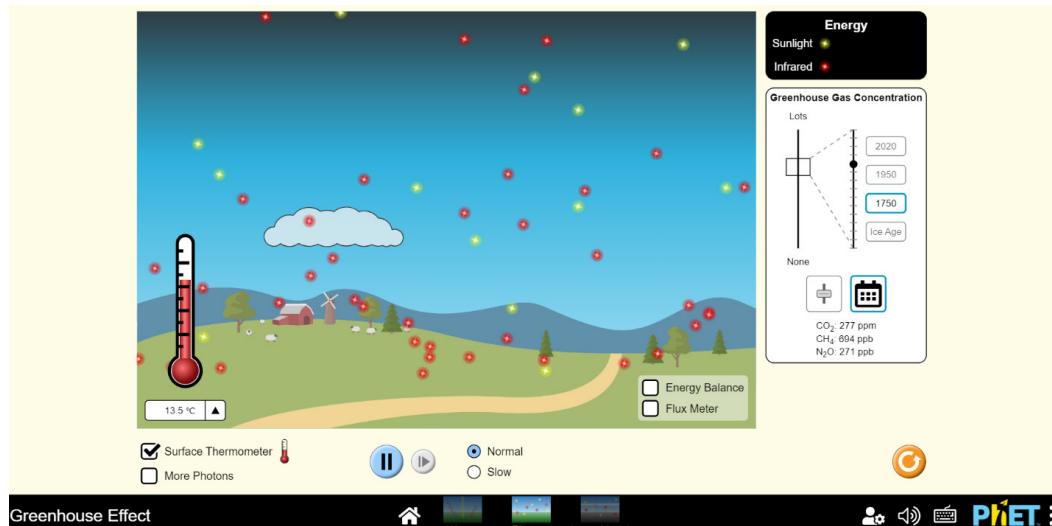
Explore 2: Greenhouse Effect Computer Simulation

(30 minutes)

15. Have students use their devices to access:
<https://phet.colorado.edu/en/simulations/greenhouse-effect/about>.
16. Explain that students will have the opportunity to explore the greenhouse effect using the simulator. Before students begin to run the simulation, ask them to predict using the sentence stem: "If we increase greenhouse gases by ___, the temperature will ___ because ___." Students can record their predictions in the space provided in their **Student Handout 2: Greenhouse Effect Computer Simulation**.
17. Use the slides to walk students through the directions. Once students have accessed the simulation have them run (or download and then run) it by clicking the play button.
Note: it takes a few minutes to load the first time you run it.
18. Have students select the "Photons" simulation and click "Start Sunlight."
19. Have students make adjustments to the simulation and tell them to play with the slider in the "Greenhouse Gas Concentration" box. Tell the students to pay attention to the temperature at the bottom left as they make adjustments to the greenhouse gas concentration.



20. Have students click on the calendar and choose the "Today," "1750," and "Ice Age" options to show how the atmosphere differed during different points in the Earth's history. Have them make note of the concentrations of carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O) during each period.



21. After students have explored the simulation, pause the class and have them write two testable questions based on their observations. Label each question as C (can test in the simulation) or R (requires research).



STUDENT SUPPORT

To support student sensemaking, you may consider sharing these sample questions such as: provide the sentence stems below:

- ➔ What happens to temperature if I double the greenhouse gases?
- ➔ What happens to ___ when ___ increases?
- ➔ What is the effect of adding/removing clouds?

22. Once students have written their testable questions, have them plan a Follow-up Run for one C-labeled question. Students should specify:
- ➔ The variable they will change
 - ➔ What they will measure
 - ➔ The number of trials
23. After completing the trials, guide students to make sense of their findings using sentence stems and frameworks aligned to **CCC (Crosscutting Concept: Stability & Change)**:
- ➔ **In this model, the system stabilizes/doesn't stabilize because _____.**
 - ➔ **Evidence:** _____.
 - ➔ **Under which settings does it return to stability?**

Explain: How the greenhouse effect works, and what the enhanced greenhouse effect is (20 minutes)



STUDENT SUPPORT

In 6th grade, students learned that the Sun, land, and water work together to create patterns of weather and climate—things like winds, ocean currents, and rainfall. Those are natural processes that have shaped Earth’s systems for millions of years. In 7th and 8th grade, they start to explore how living things and people interact with those systems. The same energy that drives weather and climate can also be affected by the ways humans use land, burn fuels, or cut down forests.

Sharing with students that Earth’s climate has always changed naturally—volcanic eruptions, solar changes, and ocean cycles can all make Earth’s temperature rise or fall. But what scientists are seeing today is different. The current rise in global temperature is happening much faster than in the past and matches the increase in carbon dioxide and other greenhouse gases from human activities—especially burning fossil fuels for energy.

Say: When we study climate change, we look at both natural and human causes. Natural processes still exist—but it’s the human influence that’s driving today’s rapid changes. Understanding this helps us make better decisions about how to reduce greenhouse gases and adapt to the changes that are already happening.

24. Watch “What is the Greenhouse Effect?” from NASA Space Place.



Video hyperlink: <https://www.youtube.com/watch?v=SN5-DnOHQmE>.

Video length: 2 minutes and 29 seconds.

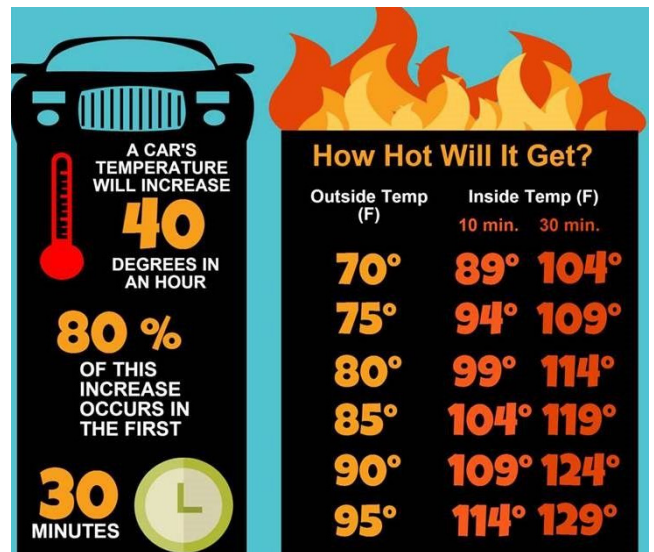
25. Write the terms “Global Warming”, “Greenhouse Effect”, and “Greenhouse Gas” on the board. Ask students to summarize what the terms mean based on the past activities and this video.



26. Ask students to return to their questions from the Engage section. Have students look at the questions they generated when exploring global temperature and carbon dioxide data. **Ask them to identify any questions they can now answer after watching “What is the Greenhouse Effect?” Facilitate a discussion where students can share what questions they now have answers to, and if they have any new questions as a result of the new sensemaking.**

Elaborate: Climate and Health - Making Sense of Human Impacts (25 minutes)

27. Ask students if they've ever been sitting in a car that is parked in the sun. If so, they've experienced a form of the Greenhouse Effect. The glass windows let in light but keep heat from escaping.
28. Explain that greenhouse gases occur naturally, but at low levels - similar to the first round of Explore 1. Without the Greenhouse Effect, the Earth would be around 60°F colder.
29. However, **human activities have led to increased greenhouse gases in the atmosphere**, leading to the increased heating of the earth and what is called Global Climate Change. Things that release greenhouse gases include:
 - Gasoline-powered cars, trucks, or buses
 - Factories
 - Power plants
 - Heating buildings



STUDENT SUPPORT

Navigating Conversation About Natural vs. Human Influences in Earth's Systems

In 6th grade, the goal is to help students recognize that Earth's systems—sunlight, air, water, and land—interact naturally to shape weather and climate. At this level, students are building foundational understanding of how energy moves through Earth's system, not yet analyzing human impacts in depth.

When human examples arise (like pollution or temperature changes), acknowledge them, but pivot back to the natural processes first. For example:

- "Yes, people can influence air quality, but let's think about how air naturally moves and changes in our atmosphere."
- "That's a great point about cities being hotter—what would happen to temperature on Earth even without cities? What role does the Sun play?"

This helps students separate natural patterns from human impacts, preparing them for deeper cause-and-effect discussions in 7th and 8th grade related to learning standards.

Encourage curiosity by framing both ideas as part of a continuum of understanding that Earth's systems have always changed—but as we grow as scientists, we'll learn more about how people fit into those systems too.



30. Urban city centers, like Atlanta and other major cities in Georgia, have seen an increase in the number of very hot days (over 95°F). In more urban areas, the urban heat island effect makes cities warmer than surrounding rural areas. These areas often have less tree cover or high-pollutive vehicles and can impact the temperature of surrounding areas as well over time.



LIVED EXPERIENCES

Connect to students' lived experiences by using students' prior knowledge to further discuss the idea of urban heat islands. This is an opportunity to define what they are and explain how they work. Facilitate discussion around the following ideas:

- Have you ever visited an area that is warmer than where you currently live?
- Have you ever noticed that the school parking lot feels hotter than the grassy soccer field?
- When you walk barefoot on a sidewalk in summer, how does it feel compared to grass?
- Why do you think that is?
- What might happen to all the sunlight that hits these surfaces?
- Which surfaces probably hold more heat?

Once students have described the effect in their own words, introduce the vocabulary:

"Scientists call this effect an urban heat island—because the city acts like an 'island of heat' surrounded by cooler land."

Connect it to their prior examples and, if possible, use local weather data or a heat map to show temperature differences between city and suburban or rural zones. You can use information and images from the following source to start conversation: <https://www.cnn.com/2021/09/18/weather/extreme-urban-heat-environmental-racism-climate>

Discuss with students the dangers of high temperatures, even in areas that are rural if that is their location, but ensure they leave the conversation with an understanding of urban heat island effect and the importance of recognizing that **increases in climate over time can be harmful to the environment.**

31. Global Climate Change can lead to many adverse effects for the environment, including:
- Sea level rise, as glaciers melt
 - More extreme weather events (hurricanes, floods, droughts, tornadoes, etc.)
 - More heat waves
32. In addition to human activity impacting the environment, the choices we make as humans have health impacts. These impacts can be positive or they can be negative on our overall health.



33. Direct students to the **Student Handout 3: Climate and Health- Making Sense of Human Impacts**. Provide students time to use their evidence from the Engage, Explore 1 and Explore 2 to engage in sensemaking.
34. Direct students to follow the directions on the handout to calculate how much an action could potentially decrease emissions versus a solo car. Then instruct students to rank the three local actions by their impact on heat-trapping emissions for a 10-mile round trip once per week.

Explain to students that the goal will be to determine which action is most effective in our context, and why.



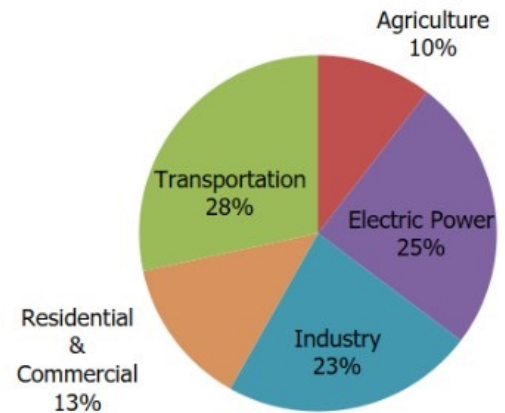
STUDENT SUPPORT

At this point in the lesson, it might be necessary to facilitate conversation with students around the importance of weighing needs/personal constraints with environmental impact. Consider giving students an opportunity to briefly share with an elbow partner an example of how the needs of a person might influence their choices. **Encourage them to discuss the impacts that these choices might have on the environment and/or their personal health.**

35. Next, **have students generate questions about how changes in greenhouse gases and global temperature might affect human health over time.**
36. **Encourage students to use evidence from the data, the kinesthetic activity, and the video to explain possible health outcomes.**
37. **Guide students to think about how gradual changes in the environment affect human health over time.**
38. **Have students share explanations and discuss how human activity can positively or negatively affect health and the environment.**

Evaluate: Ways to reduce greenhouse gas emissions (20 minutes)

39. Distribute the **Student Handout 4: Ways to Reduce Greenhouse Gas Emissions**. Discuss Figures 1 and 2, conveying the relationship between increased greenhouse gas emissions and increased global temperatures.
40. Have students discuss the EPA chart "Total U.S. Greenhouse Gas Emissions by Economic Sector in 2022."
41. Tell students: "We're going to reflect on today's simulation and activities by answering a few questions. Use your data, observations, and calculations to support your ideas."
42. Direct students to the discussion questions in the **Student Handout 4: Ways to Reduce Greenhouse Gas Emissions** (or display them on the board). Ask students to write their answers in complete sentences. Encourage them to include:
 - Evidence from today's simulation
 - Numbers or data where relevant
 - Reasoning that connects their evidence to their claim
43. After students complete their answers, have them share in pairs or small groups. **Encourage discussion of differences in predictions, evidence, and reasoning.** Highlight connections to the Stability & Change concept and the health outcomes predictions.



Georgia Commute Schools – Global Climate Dynamics

Handout 4: Ways to Reduce Greenhouse Gas Emissions

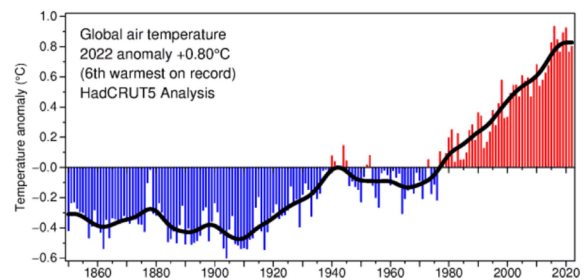


Figure 1. Global temperature record – undated February 2023, accessed from:

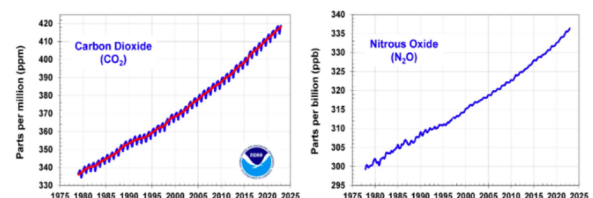
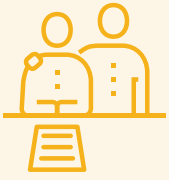


Figure 2. Global average abundances of two greenhouse gases – carbon dioxide and nitrous oxide, accessed from: <https://research.noaa.gov/article/ArtMID/587/ArticleID/2997/NOAA-index-tracks-how-greenhouse-gas-pollution-amplified-global-warming-in-2022>



STUDENT SUPPORT

As students are working, circulate the room. For students needing additional support, ask probing questions like:

- ➔ What evidence from the simulation supports your claim?
- ➔ **How does changing one variable affect system stability?**
- ➔ **Why does this action influence health outcomes?**

Have students go back to their list of questions they made in the Engage. Ask students to pick one question they are still curious about or do not have a complete answer to. Have them record their next steps for identifying answers to the question. Student responses may look like, “I will talk to my parents and ask them this question to see what they know”, or “I am going to research more during quiet work time on Friday”.

Optional Assessment Questions

The optional assessment questions section offers suggested prompts that can be used to check for understanding, guide student reflection, or spark class discussion. Teachers may choose to use these questions during whole-group conversations, small-group work, or as formative checks throughout the lesson.

Discussion Questions

- Q** What is Global Climate Change?
A *Answer: Global climate change is the change in long-term weather patterns. Changes can cause warmer or colder temperatures and annual amounts of rainfall or snowfall can increase or decrease.*
- Q** **What is causing Global Climate Change?**
A *Answer: The increase of greenhouse gas emissions by human activity is the primary cause of global climate change.*
- Q** How does Global Climate Change affect you?
A *Possible Answers: Hotter summers; increased air pollution; more asthma symptoms; increased incidences of drought; etc.*
- Q** **What can you do to prevent or slow down Global Climate Change?**
A *Possible Answers: Carpooling, riding a bike, walking, or taking the bus to school; turning off lights and appliances when not using; recycling; planting trees; eating local food from community gardens and local growers; eating less meat and eating more vegetables, etc.*

Potential Local Field Trip Ideas

Volunteer with Trees Atlanta

<https://www.treesatlanta.org/>

Trees Atlanta seeks to increase and maintain Atlanta's tree canopy, an important resource in the fight against climate change. Trees are also a natural carbon sink for excess carbon dioxide. A carbon sink is a place that absorbs more carbon than it releases. Trees Atlanta welcomes school groups to assist during planting season (October-March) and maintenance season (April-September). If students have the opportunity to volunteer with Trees Atlanta, emphasize the connection between planting trees and trees' role in taking carbon out of the atmosphere through photosynthesis.

Visit the West Atlanta Watershed Alliance Outdoor Activity Center

<https://wawa-online.org/about/>

The West Atlanta Watershed Alliance Outdoor Activity Center hosts environmental education programming, a nature preserve, and outdoor activity center. Students can learn about the organization's origins as a community environmental justice organization and what they can do to advocate and protect their local environment.

Additional Resources

The Additional Teacher Resources section includes optional materials that can support lesson delivery, extend learning, or provide enrichment opportunities. Teachers may use these resources to deepen content knowledge, adapt instruction for diverse learners, or enhance classroom engagement.

UCAR Center for Science Education The Greenhouse Effect Teaching Box

<https://scied.ucar.edu/teaching-box/greenhouse-effect>

This teaching box includes an additional 5E lesson about the greenhouse effect.

Teach Engineering Greenhouse Effect Unit

<https://www.teachengineering.org/curricularunits/view/cub-air-greenhouse-effect-unit>

This unit has 1 lesson and 4 activities that help students learn about the enhanced greenhouse effect and how this affects climate change.

NASA Global Climate Change

<https://climate.nasa.gov/>

The mission of this webpage is to engage the world with accurate, accessible, and actionable information about our rapidly changing climate, from the global perspective of NASA. This is a reliable source of information to learn about climate change.



Atlanta Regional Commission (ARC) Air Quality Page

<https://atlantaregional.org/natural-resources/air-quality/air-quality/>

This resource is written for adults and provides background information on air quality and air quality standards in Atlanta.

ARC AREES Interactive Map

<https://atlregional.github.io/DASH/arees.html>

The Atlanta Regional Commission's Atlanta Roadside Emissions Exposure Study (AREES) has a goal of understanding how local-scale air quality is impacted by changes to the transportation system. This interactive map uses AREES data to spatially depicts air quality throughout the 20-county Atlanta region, focusing on particulate matter (one of the six pollutants) concentrations resulting from the transportation system.

*This lesson plan was adapted from a lesson plan from the Teach Engineering curricula:
https://www.teachengineering.org/lessons/view/cub_weather_lesson06.*

This lesson was designed as a part of K-12 curriculum focusing on the relationship between human activity, transportation, air pollution, and health by Georgia Commute Schools. If you liked the curriculum, please leave a rating and review on [our Teachers Pay Teachers page](#).

For more information about our programs, visit gacommuteroptions.com/schools.