

### AUDIENCE

General Population

### TOPIC

Climate Change

### TIME NEEDED

50 minutes

### LEARNING OBJECTIVES

1. At the completion of this lesson, at least 80% of participants will be able to identify two ways they can reduce their carbon footprint on the post-test.
2. At the completion of this lesson, at least 80% of participants will be able to list at least 2 alternatives to driving a car as indicated by the post-test.

### MATERIALS NEEDED

- Wifi (necessary for each participant)
- Appendix A
- Powerpoint (1 presentation)
- Videos in separate browsers (2 videos)
- Carbon Footprint Calculator (necessary for each participant)
  - <https://www.footprintcalculator.org>
- Posttest (necessary for each participant)

### PREPARATION

1. Screen Sharing capabilities
2. Have quiz, survey, and activity links available to send in chat box
3. Load PowerPoint
4. Load videos in separate browsers
5. Have PowerPoint link available for download after the presentation

## PROCEDURE

### Introduction (7 minutes)

#### Powerpoint Slide 1, 2, 3, 4

- 1.) Introduce selves to the audience and state the topic of presentation
- 2.) State the two objectives for lesson
- 3.) Ice breaker for audience to introduce themselves
  - a.) Ask the class to start by saying their name and telling everyone what they think when they hear the words “Climate Change”
    - i.) This can be done by unmuting or typing in the chat
- 4.) State ground rules for the class
  - a.) No talking over each other, respect all views, no condescending language, use raise hand tool to answer questions or to comment

### Definition and Causes (10 minutes)

#### Slides 5 & 6

- 1.) State definition of climate change.
  - a.) *“Long term change in average weather patterns that have come to define Earth’s local, regional, and global climates”*
- 2.) Overview of “Greenhouse Effect”
  - a.) Definition: Warming that results when the atmosphere traps heat radiating from Earth towards space.
  - b.) Natural Causes: Greenhouse gases are naturally occurring
  - c.) Human Causes: Humans are contributing to the further outpouring of greenhouse gases
    - i.) Burning fossil fuels, oil drilling, deforestation
- 3.) Play the Bill Nye/National Geographic Video
  - a.) (<https://youtu.be/EtW2rrLHs08>)
- 4.) Play the Global Temperatures Anomalies/ NASA Climate Change Video
  - a.) (<https://youtu.be/3sqdyEpkIFU>)
- 5.) Ask follow up questions
  - a.) *“What were some key takeaways from the video? What did you learn?”*
  - b.) *“What observations did you make of the Global Temperatures Anomalies video?”*
  - c.) *“What are factors that can lead to climate change?”*

## Activity

### Slide 7 (8 minutes)

- 1.) Carbon Footprint Calculator
  - a.) Send clickable link in chat (<https://www.footprintcalculator.org/>)
  - b.) Allow class to complete assessment for 5 minutes
- 2.) Bring class back for discussion for 3 minutes
  - a.) Ask the class to share their results
    - i.) *“What did you find surprising about your results?”*
    - ii.) *“Based on your results, what do you think you may do differently?”*

## Sustainable Alternatives (10 min)

### Slides 8 & 9

- 1.) Discuss Reduce, Reuse, Recycle and Conscious Consumerism
  - a.) Empower the audience that they have control over their impact on the environment
    - i.) *“You can control the impact you have by making decisions and changing your lifestyle to reduce your impact”*
    - ii.) *“Buy what you need, not just want”*
    - iii.) *“Try taking public transportation three days a week instead of strictly driving to work.”*
    - iv.) *“We will discuss some other sustainable alternatives on the next slide”*
- 2.) Discuss sustainable alternatives
  - a.) Switch to renewable energy sources
    - i.) E.g. wind, solar
  - b.) Switch to energy efficient light bulbs and appliances
  - c.) Reduce meat in diet once a week or once every other week
    - i.) The meat industry is resource-intensive, accounting for nearly 75% of the use of freshwater worldwide (United Nations, 2019)
  - d.) Alternative Transportation:
    - i.) Public Transportation
      - (1) E.g. buses, subways, trains
    - ii.) Bikes, skateboards, scooters, walking
    - iii.) Rideshares (Lyft) or Carpooling
  - e.) Ask class to type in the chat if they know of other possibilities aside from alternatives listed on slide

## Controversies (10 min)

### Slide 10 & 11

- 1.) Discuss the divide in American politics around climate change between democrats and republicans
  - a.) Possible factors include special interest groups, fear of job loss, disbelief in scientists
    - i.) Just briefly state these, no need for detail to prevent offending Participants.
  - b.) Discuss lobbying by special interest groups
  - c.) Large donations to government elections or groups with influence
  - d.) Special interests groups such as fossil fuel, gas, and oil
    - i.) Ex. Many individuals have 401Ks, mutual funds, and/or stocks that are invested in these areas

## Conclusion (5 min)

## Slides 12, 13, & 14

- 1.) Open Q & A for final thoughts or questions
- 2.) Send link in chat for post-test to assess knowledge
  - a.) 7 questions to assess knowledge of climate change and presentation objectives
    - i.) Which of the following have been changed or altered due to climate change?  
**ANSWER: all of the above**
    - ii.) What is the greenhouse effect?  
**ANSWER: the warming of a planet due to trapped radiation**
    - iii.) What do humans do that releases greenhouse gases into the atmosphere?  
**ANSWER: burn fossil fuels (like gas and coal)**
    - iv.) Which of the following is an example of a greenhouse gas?  
**ANSWER: carbon dioxide**
    - v.) Which of the following is contributing to an INCREASE in carbon dioxide in the atmosphere?  
**ANSWER: deforestation**
    - vi.) List at least 2 ways you can reduce your carbon footprint?  
**ANSWER: switch to renewable energy sources, reduce meat consumption, transportation alternatives, energy efficient light bulbs and appliances**
    - vii.) List at least two alternatives (mentioned in presentation) to driving a car  
**ANSWER: public transportation (buses, subways, trains), bikes, skateboards, scooters, walking, & rideshares (Lyft) or carpooling**
- 3.) Show resources available in the Harrisburg and Pennsylvania regarding activism and policy around climate change (last slide)

## Appendix A

Post Test Questions:

- 1. Which of the following have been changed or altered due to climate change?**
  - a. Droughts
  - b. Flooding
  - c. Melting of polar ice caps
  - d. All of the above
- 2. What is the greenhouse effect?**
  - a. Warming of the planet due to trapped radiation
  - b. Cooling of earth due to pollution
  - c. The heating of a solid such as a rock
- 3. What do humans do that releases greenhouse gases into the atmosphere?**
  - a. Burn fossil fuels, like gas and coal
  - b. Build cement buildings
  - c. Ride bikes and use solar energy
  - d. Compete in the olympics
- 4. Which of the following is an example of greenhouse gases?**
  - a. Nitrogen
  - b. Carbon dioxide
  - c. Oxygen
  - d. Neon
- 5. Which of the following is contributing to an INCREASE in carbon dioxide in the atmosphere?**
  - a. The oceans
  - b. Photosynthesis
  - c. Deforestation
  - d. Loss of animal species
- 6. List at least two ways you can reduce your carbon footprint:**
  - a. \_\_\_\_\_
  - b. \_\_\_\_\_
- 7. List at least two alternatives to driving a car:**
  - a. \_\_\_\_\_
  - b. \_\_\_\_\_

Post Test Answers:

**Which of the following have been changed or altered due to climate change?**

- a. Droughts
- b. Flooding
- c. Melting of polar ice caps
- d. All of the above

**What is the greenhouse effect?**

- a. Warming of the planet due to trapped radiation
- b. Cooling of earth due to pollution
- c. The heating of a solid such as a rock

**What do humans do that releases greenhouse gases into the atmosphere?**

- a. Burn fossil fuels, like gas and coal
- b. Build cement buildings
- c. Ride bikes and use solar energy
- d. Compete in the olympics

**Which of the following is an example of greenhouse gases?**

- a. Nitrogen
- b. Carbon dioxide
- c. Oxygen
- d. Neon

Which of the following is contributing to an INCREASE in carbon dioxide in the atmosphere?

- a. The oceans
- b. Photosynthesis
- c. Deforestation
- d. Loss of animal species

List at least two ways you can reduce your carbon footprint:

switch to renewable energy sources, reduce meat consumption, transportation alternatives, energy efficient light bulbs and appliances

List at least two alternatives to driving a car:

public transportation (buses, subways, trains), bikes, skateboards, scooters, walking, & rideshares (Lyft) or carpooling

## References

- Citizens' Climate Lobby [CCL]. (2020). *Climate change solutions in Harrisburg, PA*. CitizensClimateLobby. citizensclimatelobby.org/chapters/PA\_Harrisburg/ Denchak, M. (2017, July 17). *How you can stop global warming*.  
<https://www.nrdc.org/stories/how-you-can-stop-global-warming>
- NASA Global Climate Change. (2020, October 21). *Causes | Facts - Climate change: Vital signs of the planet*. NASA.gov. <https://climate.nasa.gov/causes/>
- NASA Global Climate Change. (2020, October 21). *Evidence | Facts - Climate change: Vital signs of the planet*. NASA.gov. <https://climate.nasa.gov/evidence/>
- NASA Global Climate Change. (2020, January 16). *Global temperature anomalies from 1880 to 2019* [Video]. Youtube. <https://youtu.be/3sqdyEpklFU>
- NASA Global Climate Change. (2020, October 21). *Global warming vs climate change | Resources - Climate change: Vital signs of the planet*. NASA.gov.  
<https://climate.nasa.gov/evidence/>
- National Geographic. (2015, December 2). *Climate change 101 with Bill Nye | National Geographic* [Video]. Youtube. <https://youtu.be/EtW2rrLHs08>
- Pennsylvania Resources Council. (2020). *Pennsylvania Resources Council*. PRC.  
<https://prc.org/>
- United Nations. (2019, May 6). *UN Report: Nature's dangerous decline 'unprecedented'; Species extinction rates 'accelerating'*.  
<https://www.un.org/sustainabledevelopment/blog/2019/05/nature-decline-unprecedented-report/>
- United States Census Bureau. (2019, June). *QuickFacts Harrisburg city, Pennsylvania; United*

# Climate Change

Collins & LaFontaine

*States*. Census.gov.

<https://www.census.gov/quickfacts/fact/table/harrisburgcitypennsylvania,US/PST045219>

World Affairs Council of Harrisburg. (2020). *Climate change, the environment, and you!*

WACHHarrisburg.

<https://wacharrisburg.org/archives/climate-change-the-environment-and-your-impact/>