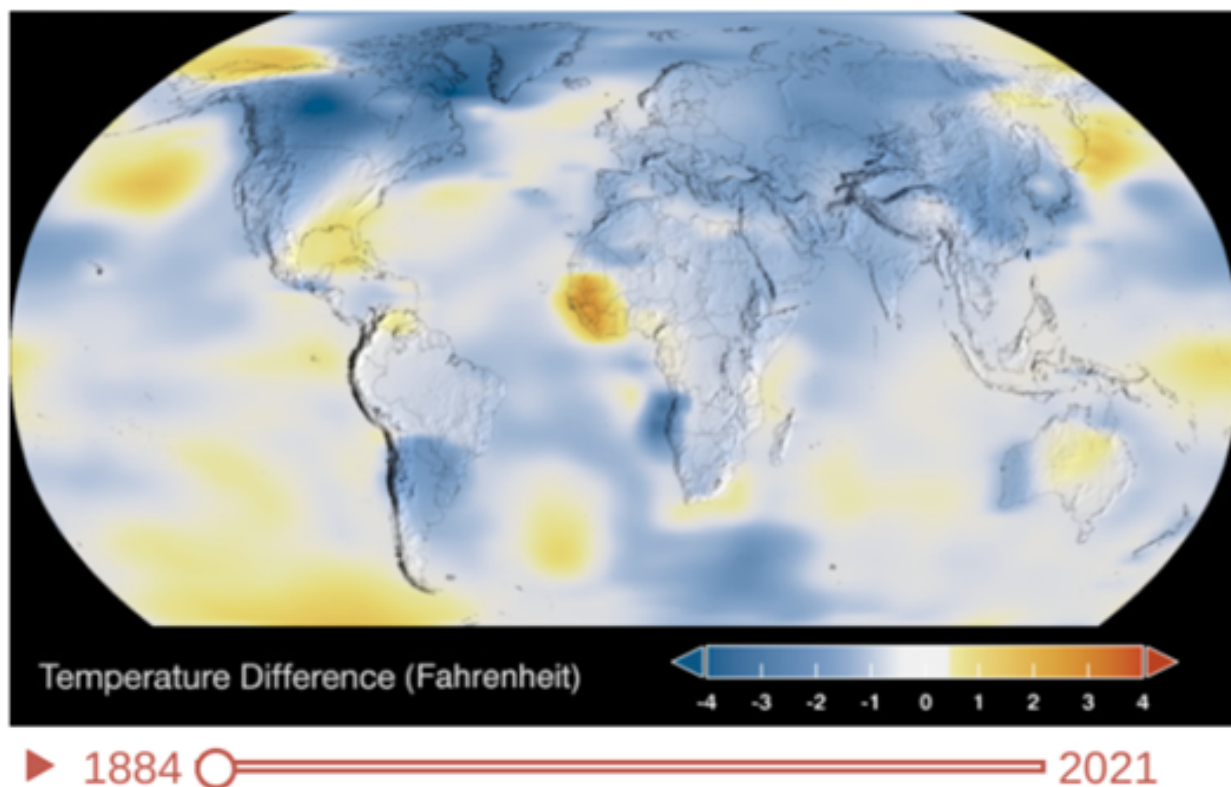


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## My NASA Data - Lesson Plans

### Greenhouse Gases: Importance & Human Impact



#### Overview

Students will watch and examine a NASA animation of Earth's rising surface temperatures over an almost 150 year period. They will make connections between rising surface temperatures and the rise of greenhouse gases in Earth's atmosphere with a class discussion and complete a graphic organizer.

#### Materials Required

- Internet access
- Video Animation: [Global Warming from 1884 to 2021](#)
- Articles:
  - [NASA: Meet the Greenhouse Gases](#)
  - [NASA Global Climate Change: The Causes of Climate Change](#)
- Graphic Organizer: [Greenhouse Gases: Graphic Organizer](#)

#### Technology Requirements

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- Internet Required

## Procedure

### [Video: Global Warming from 1880 to 2021](#)

Video

Global Warming from 1880 to 2021 | <https://www.youtube.com/watch?v=haBG2IlbwBA> | Source: NASA Climate Change

## Instructions:

1. Have students view the the NASA animation [Global Warming from 1884 to 2021](#) to observe the red and blue areas on the animation. Dark red indicates areas where surface temperature was higher than normal. Dark blue indicates areas where surface temperature was cooler than average.
2. Have students reflect on the following questions in a class discussion:
  - What trend(s) do you see as you move through the animation?
  - Did average surface temperature increase or decrease over time?
  - What has caused this increase/decrease?
  - Greenhouse gas emissions have increased the greenhouse effect, and scientists think that this change has caused Earth's surface temperature to rise over time.
    - What are the greenhouse gases?
    - Why are greenhouse gases important?
    - Why is an increase in these gases leading to warmer temperatures on Earth?
3. After reflection, students will read two helpful articles related to greenhouse gases.
  - [NASA: Meet the Greenhouse Gases](#)

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- [NASA Global Climate Change: The Causes of Climate Change](#)
4. Provide the students with the [Greenhouse Gases: Graphic Organizer](#), listing the following greenhouse gases:
    - Carbon dioxide (CO<sub>2</sub>)
    - Chlorofluorocarbons (CFCs)
    - Methane
    - Nitrous Oxide
    - Ozone
    - Water vapor
  5. For each greenhouse gas, students will summarize on the Graphic Organizer how the greenhouse gas forms, its importance to Earth, and how human activity is impacting concentration levels.

**Answers:**

Teachers who are interested in receiving the answer key, please complete the [Teacher Key Request and Verification Form](#). We verify that requestors are teachers prior to sending access to the answer keys as we've had many students try to pass as teachers to gain access.

**Sources:**

1. Global Warming from 1880 to 2021. (2022, January 13). YouTube. Retrieved September 7, 2022, from <https://www.youtube.com/watch?v=haBG2llbwbA>
2. Meet the Greenhouse Gases! (n.d.). NASA Climate Kids. Retrieved September 7, 2022, from <https://climatekids.nasa.gov/greenhouse-cards/>
3. Causes | Facts – Climate Change: Vital Signs of the Planet. (n.d.). NASA Climate Change. Retrieved September 7, 2022, from <https://climate.nasa.gov/causes/>