STEM@CGI
SCIENCE - TECHNOLOGY - ENGINEERING - MATHEMATICS

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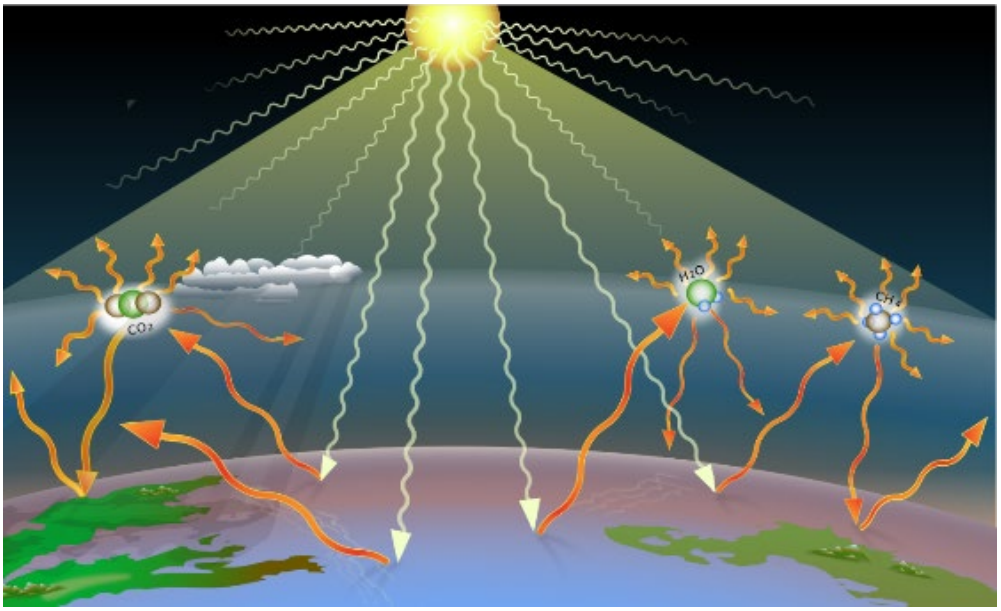
Climate Change Lesson Plan Part 3 — Ages 11 to 18 years old



The lesson plan provides basic instructions for educators and CGI STEM Champions who are executing the Climate Change virtual lesson for students who are ages 11-18. This is a high-level overview that will require adjusting to the unique needs of your students.

High Level Overview

- **Time Needed**
  - This plan is designed for a course that has a total of three (3) parts. This lesson plan is focused on Part 3. This lesson is 90 minutes in length. With student welcome, organization and movement required across teams, we have structured this content to be 85 minutes in length to add some padding. Note: this course can be expanded to more time based on the age group of the students.
- **Student Learning Objectives**
  - Given the duration of this course, we expect the students to focus on:
    - Demonstrating that carbon dioxide is a gas that can expand when released in to the atmosphere.
    - Modeling how carbon dioxide increases the temperature of water as it is released.
- **Instructors needed**
  - A minimum of 2 instructors is needed to run this course. One to present the slide deck and one to watch and respond to the chat and the presenter.

❖ **Materials needed**

- Student preparation in advance of lesson:
    - Have computer capable of running the video conferencing platform you'll be using.
    - Review Temperature Data and Graphing template
    - Have materials for expanding carbon dioxide:
        - 8 oz. bottle of water
        - 1 small balloon
        - 1 antacid tablet
        - Thermometer
        - 1 drinking glass with water
        - timer
        - Color pencils
        - Drawing paper

Climate Change Part 3

High level Task	Time (mins)	Description
Welcome	5 min	This is the time for the instructors to introduce themselves, including their credentials for teaching the course. If there is something they can say to connect with the participants at this point, this would be a good time to do it. Review group norms and agenda. Ask students to obtain materials.
What does climate change have to do with me?	45 min	Explain that Greenhouse gases are naturally trapped by the ozone layer and heat up the atmosphere to keep the earth from bitter cold. However, too much heat can be dangerous for life to thrive. Explain these gases contain carbon dioxide (CO_2) and methane (CH_4). Too much of these gases can get trapped around the earth causing the temperature to rise. Complete the two gas experiments to conduct with students as a demonstration that CO_2 is a gas that can expand and also increases the temperature of water as it is released.
Be the Explorer!	30 min	Have students draw and label a diagram with colors or color pencils showing what takes place in each experiment. Have students plot and graph their data on the Temperature Data and Graphing template found in the supplemental materials for this lesson.
Closing	5 min	Have students share and explain their diagrams and present their temperature data and graphs explaining what the data means for climate change.

Total Time	**90 min**	

Supplemental materials for this lesson can be found in the STEM@CGI at Home Activity Pack.