Demonstration: Global Warming in a Jar

FOR THE TEACHER

Summary
In this demonstration students will learn about the cause and effects of global warming. Students will research about global warming, while also comparing it to a demonstration. This will help students to better understand the effects that temperature change can have on the planet.

Grade Level
Elementary School

Objectives
By the end of this demonstration, students should be able to
- Understand what global warming is, what is causing it, and what impact it has on their lives.
- Be able to visualize global warming and the effects it has on our earth’s temperature.
- Communicate as a class as to what can be done to slow down or reduce global warming.

Chemistry Topics
This demonstration supports students’ understanding of
- Energy
- Heat
- Gases
- Temperature

Time
Teacher Preparation: 10 minutes
Lesson: 1 hour

Materials
- 2 thermometers (small enough to fit in jars)
- 2 identical glass jars (size: big enough to fit the thermometers being used in the demonstration)
- 1 clear plastic bag (big enough to fit one jar inside and clear so that the thermometer can be read)
- 1 twist tie to seal plastic bag
- Cold water (enough to fill up both jars about ¾ full, it can be tap water, the important thing is that both jars have the same temperature water at beginning of lesson)
- Measuring cup (optional)
- Heat lamp (optional if weather is not hot enough to put jars in direct sunlight)
- All students will need access to books from the library
- iPads/Computers

Safety
- No specific safety precautions need to be observed for this activity.

Teacher Notes
- “A simple definition of global warming is the recent increase in the world’s temperature that is believed to be caused by the increase of certain gases...” from Merriam-Webster
- For more information about global warming and climate change visit the links below:
FOR THE STUDENT

Lesson

Global Warming in a Jar

Background
Temperatures around the world are increasing each year and this affects all living things on the planet. During climate change we have witnessed major natural disasters that have been linked to global warming. There are many factors that are causing global warming; for example, the advances in industry and technology are playing a major role.

Problem
Is global warming real?

Materials
- Pen and notebook (to write down your findings)
- Access to books from the library
- iPads/Computers to search online

Procedure
1. Observe as your teacher sets up the demonstration.
2. Write down the “before” temperatures for jar 1 and jar 2 in the data table below.
3. After your teacher starts the clock start your research. Use books and/or the internet to learn more about global warming. Record the information that you find important or interesting in the space provided below. Below are a few topics and questions that might be helpful:
   - What is Global Warming?
   - What is a climate?
   - What kinds of negative effects can global warming have on the planet?
   - What do gases have to do with global warming?
   - What are fossil fuels?
   - Can you explain the Greenhouse Effect?
4. When the time is up, write down the “after” temperature of jar 1 and jar 2.
5. Discuss as a class your findings and your conclusions about the demonstration.

Research Findings
Record important and/or interesting information about Global Warming below:

- http://climatekids.nasa.gov/climate-change-meaning/
- http://www.cotf.edu/ete/modules/climate/GCclimate2e.html
## Data

<table>
<thead>
<tr>
<th>BEFORE</th>
<th>AFTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>JAR 1</td>
<td>JAR 1</td>
</tr>
<tr>
<td><img src="image" alt="JAR 1" /></td>
<td><img src="image" alt="JAR 1" /></td>
</tr>
<tr>
<td>Temperature: ___________</td>
<td>Temperature: ___________</td>
</tr>
<tr>
<td>JAR 2</td>
<td>JAR 2</td>
</tr>
<tr>
<td><img src="image" alt="JAR 2" /></td>
<td><img src="image" alt="JAR 2" /></td>
</tr>
<tr>
<td>Temperature: ___________</td>
<td>Temperature: ___________</td>
</tr>
</tbody>
</table>

## Analysis

1. Which jar had the higher temperature? Why did it have a higher temperature?
2. What have you learn about global warming?
3. How did these jars represent the concept of global warming?
4. Is there anything we can do to reduce the impact of global warming?
5. Can you think of a project we can start at our school to help bring awareness to this issue?