

# Unit Title: Climate Change: Science, Society, and Solutions

## Essential Question:

What roles do humans play in causing and responding to climate change?

## Objectives: Students will be able to...

1. Analyze climate data to identify trends contributing to climate change.
2. Analyze and interpret data from a scientific figure to form conclusions.
3. Describe the greenhouse effect and its link to fossil fuel use.
4. Propose solutions to reduce carbon footprints at individual and societal levels.
5. Analyze climate data to determine communities who will be most affected by climate change.
6. Communicate evidence of climate change to a non-scientific audience.

## Context:

The calendar schedule below is based on the UMSL Bridge program, an academic summer enrichment program from 7-11 grade students. This unit is designed for the 9th grade science class. Students meet for nine class periods over three weeks; each class period is 55min. The workshops labeled on the calendar are unrelated to the content of the unit.

## Elements of Note:

The final summative assessment of this unit is for students to develop and create a children's picture book around one of the climate change topics studied in the first six class periods (SLO 6). Because of this, there is a picture book integrated into the agenda of each class period; a complete list of these books can be found in the bibliography.

The Essential Question Summary Table (EQ Summary Table), is a group based modeling method that engages students in verbalizing and visualizing the connection between the content in class and how it is used to answer the essential question (Windschitl and Thompson, 2013). After each designated learning activity the class fills out the four columns of the table: Activities we did, Patterns or observations; what happened?, What do you think caused these patterns or observations?, How do these patterns help explain either how humans are the cause of human change or how humans are responding to climate change?. Based on the best practices identified by Windschitl and Thompson, only five activities will be referenced in the summary table, and the appropriate row will be filled out right after the activity is completed.

## Class Schedule:

June 23-27

Date	Objective	Agenda	Deliverables
Monday, June 23	<ul style="list-style-type: none"> <li>Analyze climate data to identify trends contributing to climate change.</li> </ul>	<ol style="list-style-type: none"> <li>“Our Planet: There’s No Place Like Earth”</li> <li>SLO Pre-Ratings</li> <li>Carbon Cycle Game - Part 1</li> </ol>	<input type="checkbox"/> Completed Pre-Rating SLOs <input type="checkbox"/> Carbon Cycle Game - Part 1 Data Complete
Tuesday, June 24	8:05 AM-10:00 AM- <i>Social Emotional Learning Workshop</i> 10:05 AM-12:00 PM- <i>Campus Quest Team Building</i>		
Wednesday , June 25	<ul style="list-style-type: none"> <li>Analyze climate data to identify trends contributing to climate change.</li> <li>Analyze and interpret data from a scientific figure to form conclusions.</li> <li>Describe the greenhouse effect and its link to fossil fuel use.</li> </ul>	<ol style="list-style-type: none"> <li>“Buried Sunlight: How Fossil Fuels Have Changed the Earth”</li> <li>Greenhouse Gas Model</li> <li>Carbon Cycle Game - Part 2</li> <li>EQ Summary Table</li> </ol>	<input type="checkbox"/> Carbon Cycle Game - Part 2 Data Complete <input type="checkbox"/> GHG Individual Model Completed
Thursday, June 26	<ul style="list-style-type: none"> <li>Analyze and interpret data from a scientific figure to form conclusions.</li> <li>Analyze climate data to identify trends contributing to climate change.</li> </ul>	<ol style="list-style-type: none"> <li>“My Life at the Bottom: The Story of a Lonesome Axolotyl”</li> <li>BTB Demo</li> <li>Food Web Orientation</li> <li>HHMI Coral Bleaching Data</li> <li>EQ Summary Table</li> </ol>	<input type="checkbox"/> Completed Food Web Diagram <input type="checkbox"/> Coral Bleaching WKST Completed
Friday, June 27	<i>Geospatial Lab during Science Class</i>		

June 30-July 4

<p>Monday, June 30</p>	<ul style="list-style-type: none"> <li>Analyze and interpret data from a scientific figure to form conclusions.</li> <li>Analyze climate data to identify trends contributing to climate change.</li> <li>Propose solutions to reduce carbon footprints at individual and societal levels.</li> </ul>	<ol style="list-style-type: none"> <li>“Listen to the Earth”</li> <li>Personal Ecological Footprint Investigation</li> <li>EQ Summary Table</li> <li>Country Comparison</li> </ol>	<input type="checkbox"/> Ecological Footprint Calculated <input type="checkbox"/> Comparison Data Table Completed
<p>Tuesday, July 1</p>	<ul style="list-style-type: none"> <li>Analyze climate data to identify trends contributing to climate change.</li> <li>Analyze and interpret data from a scientific figure to form conclusions.</li> <li>Analyze climate data to determine communities who will be most affected by climate change.</li> </ul>	<ol style="list-style-type: none"> <li>Glacial Retreat Data Activity</li> <li>EQ Summary Table</li> <li>“A Place Where Hurricanes Happen”</li> <li>Disaster Cost and Frequency (NASA Data)</li> </ol>	<input type="checkbox"/> Glacial Retreat Data Completed <input type="checkbox"/> Disaster Event Trends Identified
<p>Wednesday, July 2</p>	<p>8:05 AM-12:00 PM- <i>Career Pathways Exploration Day</i></p>		
<p>Thursday, July 3</p>	<ul style="list-style-type: none"> <li>Analyze climate data to identify trends contributing to climate change.</li> <li>Analyze and interpret data from a scientific figure to form conclusions.</li> <li>Analyze climate data to determine communities who will be most affected by climate change.</li> </ul>	<ol style="list-style-type: none"> <li>“Rainbow Weaver / Tejedora de Arcoiris”</li> <li>Thingamabob Game</li> <li>EQ Summary Table</li> <li>Economic Impact of Climate Change of Developing Countries</li> </ol>	<input type="checkbox"/> Thingamabob Game Data Completed <input type="checkbox"/> Economic Impact CER Complete (SAS)
<p>Friday, July 4</p>	<p>No Academy, <i>Independence Day Holiday</i></p>		

July 7-11

Monday, July 7	8:05-10:00 AM <i>Supply Chain Management Workshop</i> 10:05 AM-12:00 PM- <i>College of Business Workshop</i>		
Tuesday, July 8	<ul style="list-style-type: none"> <li>Analyze climate data to identify trends contributing to climate change.</li> <li>Communicate evidence of climate change to a non-scientific audience.</li> </ul>	<ol style="list-style-type: none"> <li>"No World Too Big"</li> <li>ISEF Past Climate Change Projects!</li> <li>Storyboard Book Day!</li> </ol>	<input type="checkbox"/> Climate Change Abstract Jigsaw Notes Completed <input type="checkbox"/> Storybook Topic Chosen <input type="checkbox"/> Storyboard Outline Started
Wednesday, July 9	<ul style="list-style-type: none"> <li>Analyze climate data to identify trends contributing to climate change.</li> <li>Communicate evidence of climate change to a non-scientific audience.</li> </ul>	<ol style="list-style-type: none"> <li>Work on Books!</li> </ol>	<input type="checkbox"/> Storybook Outline Finished <input type="checkbox"/> Storybook Completed! (SAS)
Thursday, July 10	8:05-10:00 AM- <i>Shortened Class Periods</i> 10:05-12:00 PM- <i>Fun Day Activities</i>		
	<ul style="list-style-type: none"> <li>Communicate evidence of climate change to a non-scientific audience.</li> </ul>	<ol style="list-style-type: none"> <li>Read-Aloud Book Session</li> <li>Post-Rating SLOs</li> </ol>	<input type="checkbox"/> Storybook Shared <input type="checkbox"/> Completed Post-Rating SLOs
Friday, July 11	9:00-11:00 AM- <i>Award Ceremony, Hilton Frontenac</i>		