**You should know how to**:

1. conduct research, verify sources, and report on their findings.
2. construct a written argument and support it with evidence.

**National or State Education Standards addressed by this activity:**

*NGSS Disciplinary Core Idea*

* Global climate models used to predict changes continue to be improved, although discoveries about the global climate system are ongoing and continually needed.

*NGSS Science and Engineering Practices*

* Ask questions to clarify and refine an explanation.
* Ask and/or evaluate questions that challenge the premise(s) of an argument.
* Develop and revise a model based on evidence to illustrate the relationships between systems or between components of a system.
* Consider limitations of data analysis (e.g., measurement error, sample selection) when analyzing and interpreting data.
* Apply scientific reasoning to link evidence to the claims to assess the extent to which the reasoning and data support the explanation or conclusion.
* Evaluate the claims, evidence, and/or reasoning behind currently accepted explanations or solutions to determine the merits of arguments.
* Respectfully provide and/or receive critiques on scientific arguments by probing reasoning and evidence, challenging ideas and conclusions, responding thoughtfully to diverse perspectives, and determining additional information required to resolve contradictions.
* Construct, use, and/or present an oral and written argument or counter-arguments based on data and evidence.
* Critically read scientific literature adapted for classroom use to determine the central ideas or conclusions and/or to obtain scientific and/or technical information to summarize complex evidence, concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

*NGSS Crosscutting Concepts:*

* Students observe patterns and cite patterns as empirical evidence for causality in supporting their explanations of phenomena.
* Students suggest cause and effect relationships to explain and predict behaviors in complex natural and designed systems. They also propose causal relationships by examining what is known about smaller scale mechanisms within the system. They recognize changes in systems may have various causes that may not have equal effects.
* Students can investigate or analyze a system by defining its boundaries and initial conditions, as well as its inputs and outputs. They recognize that predictions have limited precision and reliability due to the assumptions and approximations inherent in the models.
* Students understand much of science deals with constructing explanations of how things change and how they remain stable. They quantify and model changes in systems over very short or very long periods of time.

**Goals for this activity:**

* **Content/concepts:** Using a historical context, this activity introduces atmospheric chemistry and physics, economics and fossil fuels, the compilation of data that supports the theory of climate change, and the international decision-making that has been initiated to begin to mitigate and help societies to adapt to climate change. This activity is designed to begin to address those questions regarding the history of climate science, when discoveries were made, why climate science has become a political issues, and how society can be affected by scientific discoveries, economic opportunities, and political decisions.
* **Higher order thinking skills**: Students are expected to synthesize ideas and critically evaluate the current social perspectives of climate science and social decision-making.
* **Other skills goals for this activity**: Research, Collaboration, Respectful discussion, Analysis and Synthesis of students’ own ideas with their new learning.

Description of the activity/assignment

* Day 1: You will be working in your small groups to conduct online research a random set of important historical events in climate science. You will need to know the date, event details, and any other possible events correlated to your event.
* Day 2: Categorize your researched events as “scientific”, “cultural”, “economic”, or “political”. Write the date and a title of the event on the appropriate sticky notes (yellow = science, pink = culture, green = economic, blue = political). As a whole class, we will create a timeline of the events. When the timeline is complete go back to your small group and identify when major changes in the categorization of the events changes.
  + What are the time frames for the different event categories, “scientific”, “cultural”, “economic”, or “political”?
  + When do we see a change in the categories that dominate the timeline? (When do we start to see economic events becoming predominant?)
  + What are the perceived causes in those changes of predominance? What factors may be causing this
  + Do you know of other events that we should include in this timeline? Why?
* Homework: Synthesize your learning by writing a research paper on a set of at least 5 events that you perceive to be connected. These are assessed for clarity and precision, use of appropriate vocabulary and scientific thought, and avoidance of emotional or inflammatory language.
* YOU WILL BE TESTED ON THESE EVENTS.

Supporting references/URLs

<http://topics.nytimes.com/top/news/science/topics/globalwarming/index.html>

<http://www.agu.org/sci_pol/positions/climate_change2008.shtml>

<http://www.aip.org/history/climate/index.htm>

<http://www.aps.org/policy/statements/07_1.cfm>

<http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-chapter1.pdf>

<http://www.livescience.com/1292-history-climate-change-science.html>

<http://www.nytimes.com/interactive/2009/12/07/science/20091207_CLIMATE_TIMELINE.html?_r=0>

<http://www.skepticalscience.com/climate_science_history.php>

<http://www.skepticalscience.com/history-climate-science.html>

<https://www.aip.org/history/climate/timeline.htm>