

Climate Change in the Social Studies Classroom: A “Why” and “How to” Guide Using the C3 Framework

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Weather phenomena across the United States have provided heightened attention to climate change in headlines such as “Heavy Rain and Floods: The ‘New Normal’ with Climate Change?” (*Christian Science Monitor*, Aug. 14, 2014); “Delay Action on Climate Change by 10 Years and Costs Rocket 40%” (*Time*, July 29, 2014); “State Hearing Focuses on Cutting Greenhouse Gases” (*Fort Worth Star Telegram*, August 18, 2014); and “More Severe Tornado Outbreaks may be Linked to Climate Change” (CBS, August 8, 2014). As a result, many people find themselves wanting to know more about climate change, our students included. Yet how many of us take the opportunity to bring climate change into the classroom? Undoubtedly social studies teachers may be less familiar with the physical mechanisms of climate change, but this should not prevent us from taking the opportunity to discuss and debate the role of government and citizens. While natural scientists are busy unraveling the physical mysteries of climate change, the realm of applying this knowledge to decision making rests firmly in the social sciences. In this article, we discuss why the social studies classroom is in many ways an ideal place to incorporate climate change and how teachers might use the C3 Framework to structure climate change inquiry. Using the C3 Framework, we will outline an example of how climate change might be used in a civics or government course, then touch briefly on history, economics, and geography. We will begin with a brief overview of climate change before moving on to its use in the classroom.

Climate change is not new, and the warming role of carbon dioxide (CO₂) in the earth’s atmosphere (the greenhouse effect) has been known about since the 1800s.¹ As early as 1965, President Lyndon Johnson warned of atmospheric change brought by increased carbon dioxide.² In the many decades since then, scientific certainty regarding the climatic impacts of rising greenhouse gasses in the atmosphere has increased.³ For example, we have been able to understand Earth’s past climates through ice core sampling, tree ring analysis, and measuring iso-

tope ratios in sediments. We have direct CO₂ measurement data starting in 1958 from Mauna Loa, Hawaii. Carbon dioxide, along with methane (from landfills and livestock farming, for example) and nitrous oxide (from agriculture and industrial process, for example), are of particular concern because of their persistence in the atmosphere; once emitted, they remain in the atmosphere for decades to centuries, all the while warming the atmosphere.

If you wish to review the scientific evidence regarding climate change with

your students, numerous freely available online resources exist. A “resource of resources” specifically designed for educators entitled “Advancing Climate Change Environmental Education: Resources and Suggestions” is a good place to start.⁴ Two additional resources geared towards the layperson were released in early 2014: “What We Know” and the National Climate Assessment.⁵ “What We Know” was produced by the American Association for the Advancement of Science and contains links to several short videos and a concise document providing an overview of climate change.

Why Social Studies?

Because of its media spotlight and politicized nature, climate change is a perfect topic to engage students in social studies courses, including civics and government, which we highlight here. Climate change applies to local, state, regional, national, and international governance. For example, some mayors have signed the U.S. Conference of Mayors Climate Protection Agreement (see if your town is listed: www.usmayors.org/climate-protection/map.asp).

Of the states, 34 have created climate action plans (www.czes.org/us-states-regions/policy-maps/climate-action-plans), while regional initiatives include cap-and-trade programs among others

Table 1. C3 Framework Organization (C3 Framework, 2013)

Dimension 1: Developing Questions and Planning Inquiries	Dimension 2: Applying Disciplinary Tools and Concepts	Dimension 3: Evaluating Sources and Using Evidence	Dimension 4: Communicating Conclusions and Taking Informed Action
Developing Questions and Planning Inquiries	Civics	Gathering and Evaluating Sources	Communicating and Critiquing Conclusions
	Economics	Developing Claims and Using Evidence	Taking Informed Action
	Geography		
	History		

(more at www.czes.org/us-states-regions/regional-climate-initiatives). While we do not have a cohesive national level climate action plan, President Obama released his administration’s plan in June 2013 (www.whitehouse.gov/sites/default/files/image/president27climateactionplan.pdf). At the international level, the most well known effort is the United Nations Framework Convention on Climate Change (<http://unfccc.int/2860.php>), which led the Kyoto Protocol efforts.

Additionally, the complexity of climate change makes it relevant to all social studies courses: civics, history, economics, geography, psychology, current events and more. A vast array of resources exist for teachers, several of which we discuss here.

Perhaps most importantly, climate change is an excellent topic to help students achieve social studies learning outcomes. In the next section, we use the C3 Framework to demonstrate how climate change might be used to meet social studies learning outcomes in a high school civics course. We chose the C3 Framework since it is the most recent national level guide for developing state social studies standards, and it connects to the Common Core Standards.

How: A Civics/Government Example Using the C3 Framework

The C3 Framework was created in part by representatives from each of the major social studies disciplines as well as other social studies organizations. One of its fundamental objectives calls for enhancing the rigor of social studies through

building critical thinking, problem solving, and participatory skills necessary to become engaged citizens. This should not come as a surprise to any social studies educator since this objective has been recognized as foundational to social studies education across both time and place.

Finding a place to incorporate climate change into your social studies curriculum has become even more viable through the C3 Framework. The framework, through its Inquiry Arc, facilitates multiple opportunities which allow students to create questions, investigate them, critically evaluate evidence, provide potential solutions, and most importantly, to communicate and act upon what they have discovered (See Table 1). The skills developed through this inquiry sequence are transferable, lifelong competencies that will enable students to continue confronting and unraveling compelling issues such as climate change.

Dimension 1: Developing Questions and Planning Inquiries

Dimension 1 calls for the generation of both compelling and supporting questions by teachers and students. How students are introduced to the issue of climate change is essential for eliciting the compelling questions that will drive their inquiry. Teachers can introduce the topic of climate change through local, regional, or global lenses. Identifying relevant connections to climate change also depends upon where their communities are located and the impacts, both

observable and non-observable, that climate change has had on them. Social studies teachers may wish to include two key decision-making areas: mitigation (reducing our greenhouse gas contributions) and adaptation (responding to climate change impacts).

The following are potential examples of compelling questions about climate change:

- Why is climate change a politically divisive topic?
- What role does the government have in climate change mitigation and adaptation?
- What role do citizens have in climate change mitigation and adaptation?
- What role do corporations have in climate change mitigation and adaptation?
- What are the short-term and long-term economic/political/social/environmental consequences of climate change?
- What do each of the above look like from a local, regional, and/or global perspective?
- How can climate change be addressed on the local, regional, and global levels?
- Who is most responsible for addressing climate change?
- How have different countries addressed climate change since the 1970s?

Once compelling questions are created and/or identified, students then are guided toward creating supporting questions. Supporting questions help students

Table 2

Compelling question	Supporting questions
Why is climate change a politically divisive topic?	<p>A. Where does each party stand on climate change?</p> <p>B. What are some ways political parties have addressed climate change?</p> <p>C. Does the level of government (local, state, federal) impact how representatives from a political party view climate change? E.g., Do state level party platforms differ from national level party platforms?</p> <p>D. Does the geographic location of a representative from a political party influence his or her stance on climate change? Why and/or how?</p> <p>E. What are some other factors that may or may not influence a political party's stance on climate change?</p> <p>F. How do citizens who identify themselves with the Republican and Democratic parties feel about climate change?</p>

to narrow down and frame the specific disciplinary content areas they will need to focus upon in order to directly address their compelling questions.

Our example will focus on addressing compelling and supporting questions from a civics perspective; see Table 2.

Dimension 2: Applying Disciplinary Concepts and Tools

What does Climate Change look like through the civics lens? Here we provide examples of applying disciplinary concepts and tools for each category within the civics discipline (from the C3 Framework, listed below). Teachers and students can use the categories to identify and develop the specific content they will need in order to address their compelling and supporting questions.

Specific concepts and tools for the three categories within civics could include:

- *Civic and Political Institutions*—political party system, conservative, progressive, liberal, independent, the three levels of government (local, state, federal), U.S. government structure;
- *Participation and Deliberation: Applying Civic Virtues and Democratic Principles*—multiple perspectives, deliberation, limited government, social contract, separation of powers, respect for individual rights, relevance and impact of personal interests and perspectives;
- *Processes, Rules, and Laws*—public policy (purpose, implementa-

tion, consequences), procedures for making decisions, specific rules and laws for addressing issues/problems such as climate change.

Thinking about concepts and questions leads us to ask what data sources might help us address our questions. Dimension 3 covers this topic.

Dimension 3: Evaluating Sources and Using Evidence

Higher-level students may be able to both find their own sources and evaluate them. In some cases, time or resources may limit research. However, all students should evaluate sources. For example, students should be able to use and to explain the differences between primary and secondary sources.⁶ For web sources, students should understand how domain suffixes with .edu, .gov, .org, and .com might differ.⁷

For our civics example, we have found sources that can address the supporting questions C, D, and F listed in Table 2. Below, we list sources underneath the corresponding question. Our sources include primary sources (such as the national and state party platforms), secondary sources (such as the *Houston Chronicle* article), a variety of domain suffixes, and maps (links under California's political geography). The majority of our sources are primary sources by design.⁸

C. Does the level of government (local, state, national) impact how representatives from a political party view climate change? (E.g., Do we see differences in

state level party platforms and national level party platforms? Do Republican governors hold similar views to Republican mayors?) If there are differences, what might explain it?

- Federal data:
 - * Democratic and Republican national platforms www.presidency.ucsb.edu/platforms.php
- State data:
 - * Texas GOP 2014 temporary platform <https://s3.amazonaws.com/s3.documentcloud.org/documents/1182339/temporary-platform-committee-report.pdf>
 - * Massachusetts GOP 2010 platform http://2014.massgop.com/wp-content/uploads/2012/06/Mass_GOP_Party_Platform_2010.pdf
 - * Texas 2014 Democratic Party platform <http://txdemocrats.bytrilogy.com/pdf/2014-Platform.pdf>
 - * Massachusetts 2013 Democratic Party platform <http://massdems.org/wp-content/uploads/2014/05/2013-MDP-Platform-FINAL.pdf>
- Local data:
 - * “U.S. Mayors Pass Climate Change Resolution,” Laura Barron-Lopez, *The Hill* (June, 23, 2014),

<http://thehill.com/policy/energy-environment/210273-us-mayors-pass-climate-change-resolution>

D. Does the geographic location of a representative from a political party (e.g., urban California versus rural California or Midwest versus West coast) influence his or her stance on climate change? Why and/or How?

- * California's political geography, www.ppic.org/main/publication_quick.asp?i=1007, www.ppic.org/content/data_CaPoliticalGeographyGlobalWarming.pdf
- * "Geography Trumps Political Party in Energy Measure," Jennifer A. Dlouhy, *Houston Chronicle* (March 29, 2009), www.chron.com/business/article/Geography-trumps-political-party-in-energy-measure-1736321.php

F. How do citizens who identify themselves with the Republican and Democratic parties feel about climate change?

- *Pew Research Center Polls, Climate Change: Key Data Points from Pew Research* (January 27, 2014), www.pewresearch.org/key-data-points/climate-change-key-data-points-from-pew-research/

Using Evidence

Once students find sources, they must be able to evaluate how to weigh each source and how to use the evidence in the sources to make arguments. With longer documents such as the Texas GOP 2014 platform listed, students may first have to find references to climate change within the document. Students can find references to climate change (or global warming) by using the ctrl-f shortcut command on a PC or the command-f search on an Apple computer.

Dimension 3 examines the basis upon which political and social scientists

might make their claims. For example, the Pew Research Center data might provide the basis for statistical claims about how most Republicans or most Democrats feel about climate change. Meanwhile, searching the national party platforms for references to climate change can indicate the relative importance each party places on climate change in an official capacity (compared to the individual responses of the Pew data). The sources on political geography suggest that where one lives might play a role in one's political perspectives on climate change or energy.

Advanced students might additionally use theories of political and party behavior to explain why and how parties might have different views. For example, Republicans tend to value the concept of freedom over the concept of equality, while Democrats tend to value equality over freedom.⁹ Students might consider how various political responses to climate change value equality versus freedom. For example, mandating reductions in carbon emissions would adversely impact freedom via reducing options of energy production and consumption.

An important point for students to recognize is that they are unlikely to find one clear explanation for their question. Examination of the documents above suggests that many factors contribute to the divisive nature of climate change: parties have staked out clear platforms that include or omit climate change; geographic regions may be impacted differently by climate change policies versus climate change itself; and even within parties at different levels of government, we see disagreement on the issue.

Dimension 4: Communicating Conclusions and Taking Informed Action

Communicating and Critiquing Conclusions

The C3 Framework suggests several ways

that students can communicate their findings. Essays, reports, presentations, blogs, policy statements, and newspaper articles or op-ed pieces are just some of the methods students can use. Students' construction of arguments from the evidence they have gathered should include both the strengths and limitations of their arguments.

In addition, the claims and evidence used should be critiqued for their credibility as well as their structure within the work submitted. Students may also respond to and critique each other's work in a classroom forum. For example, each student may have three to five minutes to orally respond to a limited number of questions from classmates.

Taking Informed Action

Having students communicate their conclusions and take action is the most exciting yet perhaps the most ignored activity in social studies classrooms. Taking action might involve creating a video presentation, sending their report to public officials, or raising awareness of the issue among the student body. It is through this authentic experience that the students have the opportunity to apply the knowledge and skills gained through the inquiry process. The placement of this final element of the C3 Framework is purposeful in its intent to ensure that the students at the end of the inquiry process have navigated their way toward a purposeful, informed, and reflective action taking experience.¹⁰

Economics, Geography, and History

These subjects are equally conducive to using climate change and the C3 Framework. Many of the previously listed compelling questions would also work in these courses, including the questions used in our civics example. From an economics perspective, students could examine party platforms, speeches, or other official documents for connections between the economy and climate change (or the economy and energy). For geography, students

might examine maps for patterns in climate change impacts, states and cities with climate action plans, and political party leanings. In history, students could examine changes in party platforms over time regarding climate change or changes in citizen's views about climate change. They could also compare the historical context of President Johnson's speech to other presidential speeches on climate change. In the case of history, students might also have to look for references to global warming, as this term was more commonly used in earlier decades.

Conclusion

Social studies' interdisciplinary nature provides ample opportunities for students to address potentially life-altering twenty-first century issues such as climate change. As a complex, global, and comprehensive issue, it also intersects with most of the NCSS standards and therefore can be explored in all of the social studies disciplines. Thus applying the inquiry process of the C3

Framework is a logical next step for social studies educators and students, allowing them to explore and address one of the single most impactful issues of our time. Our students are curious about the world around them, including popular media topics like climate change. Let's help them see the relevance social studies brings to their lives and futures. Let's help them quench their curiosity by providing intriguing inquiries in our classrooms. 🌍

Notes

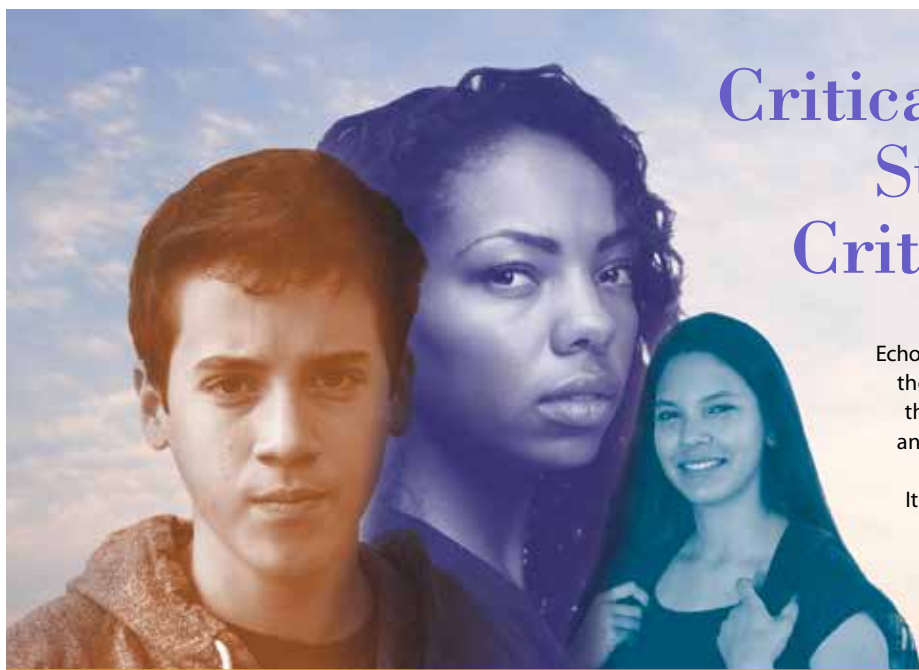
1. For more see the Tyndall Centre, www.tyndall.ac.uk/About/Who-was-John-Tyndall.
2. *Public Papers of the Presidents of the United States: Lyndon B. Johnson*, 1965. Volume I, entry 54, pp. 155-165. Washington, D. C.: Government Printing Office, 1966. Electronic version: www.lbjlib.utexas.edu/johnson/archives.hom/speeches.hom/650208.asp
3. For more on greenhouse gases, see the *IPCC Fourth Assessment Report: Climate Change 2007*, www.ipcc.ch/publications_and_data/ar4/wg1/en/tssts-2-1.html.
4. *EE Capacity*, www.eecapacity.net/climate-change-ee-project-based-online-learning-community-alliance.html
5. American Association for the Advancement of Science (AAAS), What We Know initiative,

<http://whatwewknow.aaas.org/>; National Climate Assessment, <http://nca2014.globalchange.gov>.

6. Many university writing centers provide guidance on this, for example: <http://writingcenter.unc.edu/handouts/evaluating-print-sources/>.
7. The University of Georgia system provides one useful guide: www.usg.edu/galileo/skills/unit07/internet07_08.phtml.
8. A similar exercise using only secondary sources would also be valuable but is beyond the scope of this paper.
9. Kenneth Janda, Jeffrey M. Berry, Jerry Goldman, and Deborah Schildkraut, *The Challenge of Democracy* (Cengage Learning, 2012).
10. NCSS, *Social Studies for the Next Generation: Purposes, Practices, and Implications of the College, Career, and Civic Life (C3) Framework for Social Studies State Standards*, Bulletin No. 113 (Silver Spring, Md.: NCSS, 2013).

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