

Climate Change and Regional Geography

Climate change can bring an immediate and pressing relevance to geography study, coaxing new ideas out of worn textbooks



Photographs: Talia Epstein

Students take to the streets to raise awareness of climate change on Alternative Transportation Day.

by **Talia Epstein**

RARELY TODAY DO WE open the newspaper or watch the news without coming across a mention of climate change. Predictions are that in the near future the warming of our planet will be one of the biggest political and social issues we will face.

Students need to understand the science behind climate change as well as the effects it may have on their local area and their country. One way to incorporate this complex topic into our curricula is to pair climate change with the regional and national geography studies that students traditionally undertake in upper elementary school. Last year, as a teaching fellow in a sixth grade classroom, I was asked by my cooperating teacher to revamp what she saw as a stale and outdated geography curriculum. I decided to match climate change to the regional geography curriculum, thereby creating a more relevant and multidisciplinary unit to help

students understand what climate change might look like in various regions of the United States. In the end, our students were not only better geographers and climate scientists; they were also motivated to take action on climate change issues.

One of the best ways to engage older elementary children in an issue is by giving them responsibility for its outcome. Imagine as a fourth, fifth or sixth grader being told that you are to become an active player in climate change issues, when normally you don't even have a say about your bedtime! In our class, this was the essential hook for gaining students' interest. On the first day of the unit, a very official looking letter arrived from the fictitious offices of the U.S. Department of the International Panel on Climate Change. This letter explained that the students' help was needed in a study on the future impact of climate change on different regions of the United States. The students were asked to become experts on the regions, learn about the climate-change predictions, and create theories

for how life in the various regions would be affected. Specifically, the students were asked to contemplate what life might be like in the region in 100 years, and what people should do to attempt to slow down climate change. The students were intrigued and a little suspicious of the letter's validity, but that became a humorous aspect of the unit, providing an inside joke as well as motivation to work towards a meaningful outcome.



Region group interviewing a state expert.

Format of the unit

A complete regional geography/climate-change study such as this requires three or four weeks of a social studies block. In our class, every student was assigned to a group representing a particular region of the United States. We defined regions as they were defined in our textbook (Northeast, Southeast, Midwest, Rocky Mountain, Southwest and Pacific regions); but depending on your goals and resources, you may wish to look at natural bioregional divisions.

If you have a large class, you can have more than one group studying a particular region so that no group is too large.

In addition to the group region study, an important component of the unit was an individual poster project that assigned a state to each student. In their poster displays, they were required to include maps and information on industry, tourism, state symbols, history, and physical or natural features of their state. This allowed each student to become an expert in a smaller area of study. The poster project was mainly completed as homework, but the expertise that students gained from it was shared with the class in the regions study. While the teachers formed the regional groups by considering group dynamics (rather than regional preferences), the students had some say in choosing which state they would study for the poster project.

Resources

You may wish to do some background research of your own, but don't worry if the perfect resource to link geography and climate change is elusive. Our classroom had a motley collection of painfully outdated and dog-eared textbooks on regional geography that served as our main resource for in-class readings. These were not the ideal resources from which to base our study, but they provided a basic background on the topics that students needed to understand. Using a traditional textbook for a geography study centered on climate change required only some adjustments to the

discussion questions and some new activities designed specifically for the unit.

Background and prior knowledge

Our students realized that the regions defined by our textbook were generalizations, and so early in the unit we brainstormed ideas to try to determine what really makes something a region. The students wrestled with such questions as: Does a

region form a people, or do people form a region? Is a region culturally defined, or is it created by physical features? During these discussions, students arrived at questions of climate, which we decided is one of the major defining features of a region.

As climate was a central theme of our region study, it was essential that students have some background on climate change to help them understand the significance

and relevance of the issue. The sixth graders I worked with had watched Al Gore's film *An Inconvenient Truth* several months before the unit, and this served as a good

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foundation for our work. Another way to provide that background would be to ask students to bring in newspaper clippings or reports of television stories about climate change in the weeks before the unit. Any readings, films or presentations that enable the class to tune in to the significance and relevance of climate change will prepare them for the ideas in the unit.

Unit outline

Our unit covered all of the basic topics in a traditional regions study, but with added emphasis on those related to climate change. Many of the topics came straight from our textbooks; it was the angle from which we approached them that shed light on questions of climate change. The topics included:

- the difference between weather and climate
- the physical geography, climate and natural disasters of the region
- the Native Americans of the region, with a focus on how they adapted to the unique characteristics of the region
- the natural resources and industry
- tourism and major cities
- water issues
- specific climate change information

To investigate these topics, students answered questions from the textbooks and used drama and creative writing to explore concepts. They also called on the expertise of their classmates to learn about the states they were studying individually for the poster project. We held a Convention of States, in which groups interviewed the representatives of each state in their region (or as many states as were represented in their class) and asked them about the main tourist attractions, locations of major cities and other features of their state. The students had researched this information for their posters and they loved being interviewed as experts. The regional groups were able to use this information to flesh out the current picture of their region as they prepared to imagine its future. This was one of the most successful activities in the unit.

Water issues are often linked to climate change concerns, and this was an important topic for the region study. Some regions have an abundance of water, while others already face shortages that are predicted to worsen with climate change. To understand how water issues relate to regional geography and climate change, we created an imaginary river that crossed several regional boundaries and had the potential to be diverted from one region to another. Then the class held a mock meeting of a water council to debate the allocation of the water. The students used the information they had gathered about the biodiversity, culture, natural resources and economy in their region to advocate for the best use of the water. Applying their information to a contentious issue helped them to see how much they had already learned about their regions and deepened their appreciation for the complexity of the issues. Once the students stepped out of their roles and were no longer arguing for their special interests, they observed that water, like climate change and many other environmental issues, doesn't obey human-drawn boundaries.

The students needed to understand the science behind climate change if they were going to be able to connect it to the future of their regions. In our class, I began this by teaching a short review of the greenhouse effect. Our school is fortunate to be affiliated with a college, and this allowed us to call on a professor of geology to provide deeper and more specific information about climate change predictions. This expert presentation was essential to helping the students form theories about the impact of climate change in their study region. For schools without access to academic or business organizations that deal with climate change science or predictions, local meteorologists and informational films on climate change, such as *An Inconvenient Truth*, would also be good sources of background information.

The final activity of the unit asked the students to compile the information they had gathered and take action as experts. Each group was asked to select a policymaker from their region of study and write a letter explaining what they had learned about the region and climate change. They began by filling in a worksheet to summarize what they had learned about the region, the predicted climate changes, how those changes might affect life in the region and, finally, suggestions for actions that the lawmaker should take. We also spent time talking about how to find a political representative and how to write this type of letter. Many students initially doubted that their letters would have much impact.



A discussion with the class about the responsibility of lawmakers to represent and respond to constituents and how much power informed citizens can have turned into a great civics lesson.

One student wrote to a Utah congressman, explaining that Utah is in a difficult situation because of the importance of both the skiing and the coal mining industries in that state. He pointed out that the amount of carbon dioxide emitted by coal-fired power plants makes it unlikely that both industries can flourish in the future. Another student wrote, "Recycling is always good, but a law needs to be made about protecting the environment." She went on to urge the state senator from Washington to take action so that her state will not face the burden of the floods and drought that are predicted to increase with climate change.

The excitement grew in our class as the reply letters started to come in. Some responses were from local representatives, but we even got a letter from U.S. Presidential candidate Barack Obama. There was plenty of debate about whether the signatures were really signed or if they had been stamped on the letters (something I had prepared the students for), but each reply was seen as proof that their voices had been heard.

Assessment

Assigning the students the task of proofreading each other's letters before they were sent ensured that the letters were more polished and provided a way for students to share what they learned. We used these letters as part of the assessment for the unit. In addition, we gave an open-note test. This unit asks students to consider questions that do not always fall into black-and-white categories — for example, no one knows exactly what will come with climate change — and so we tried to give our students questions that would allow them flexibility in their answers. The questions challenged them to describe unique features of their region of study, but also to state what region they would like to live in and to give a good case for their choice (taking into account everything they had learned, including climate change

predictions). One student wrote that he would like to move to Alaska, because he had learned that Massachusetts (where he lives) was predicted to have a climate similar to that of North Carolina, which, in his opinion, would be much too hot.

We created an imaginary river that crossed regional boundaries, and the class held a water council meeting to debate the allocation of the water.

of carbon dioxide. One student who lives quite a distance away from school got on his bike and, with his teacher escorting him much of the way, rode for two hours to get to school, serving as an inspiration to everyone. The class marched through town, chanting, singing and

Taking action

As students become expert geographers and climate change specialists, they are likely to feel motivated to take further action. Encourage your students to organize a local campaign or event and allow them to apply their newfound knowledge. If you can, let the action idea come from the students themselves.

In our class, motivation to take action developed into a successful Alternative Transportation Day, when every student in the class walked, biked or carpooled to school (there are no school buses at our private school). In math class, we used the study of rate and ratios to calculate the amount of gas that would be saved by these actions, and the students wrote this information on flyers that they handed out. We calculated that we would prevent 46 kilograms (102 pounds) of carbon dioxide from going into the atmosphere and save \$11.58 (US) in gas. Not a great savings in one day, but our calculations revealed that if we continued using alternative transportation throughout the school year, we would save an estimated \$2,084 and 8,335 kilograms (18,360 pounds)

handing out the flyers that highlighted the work and carbon dioxide savings. The success of the event was complete with an article in the local paper.

Our unit showed that climate change can bring an immediate and pressing relevance to geography study, coaxing new ideas out of worn textbooks. By intertwining climate change and geography, we can encourage students to think about how regions are defined, about the impact of climate on their lives, and about the difference between natural changes and those caused by human activities. Our students can become not only better geographers but also concerned citizens motivated to take action for the future of their region.

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