

SCIENCE

Finding Hope in the Face of Climate Change: Why Some Teachers Focus on Solutions



By [Sarah Schwartz](#) — November 23, 2021 11 min read

Lorenzo Worster's 6th graders don't usually enter his science class at the beginning of the year with much specific knowledge about climate change. But a lot of them have internalized one pretty scary idea: We're all in big trouble.

Much of students' worry comes from overhearing adult conversations, or from reading headlines that say things like, "We only have 10 years before the end of the world," said Worster, who teaches at the Sierra Expeditionary Learning School, a charter school in Truckee, Calif.

He tries to help his students parse out these kinds of apocalyptic declarations by delving into the science behind them—how exactly would the climate change if society stays on the same course it's on now? And what technology solutions and policy changes could help reverse that course? Still, it can be hard to stay optimistic.

"We try to have honest conversations about the anxiety," Worster said.

Scientists say that climate change now constitutes an [environmental emergency](#). The [latest report](#) from the Intergovernmental Panel on Climate Change, a group of scientists convened by the United Nations, has forecasted that Earth's temperature will continue to increase over the next two decades, regardless of nations' attempts to cut the carbon emissions that are driving the problem. The rise will bring life-threatening climate conditions for millions around the world. There is still time to avoid a worst-case scenario, the report says, but only if countries act now.

Many students across the United States have already felt the effects of a warming planet,

in heat waves, longer wildfire seasons, and flooding that have [closed schools and displaced families](#). And young people across the globe are concerned. A [huge new study](#) led by researchers at the University of Bath in England surveyed 10,000 teenagers and young adults, asking 16- to 25-year-olds in 10 countries, including the United States, how they felt about climate change. Almost 60 percent said they felt “very” or “extremely” worried, and more than half said they felt “afraid, sad, anxious, angry, powerless, helpless, and/or guilty.”

For teachers, the scale of the problem and the intensity of some students’ emotions pose a big challenge: How can they convey the seriousness and complexity of the climate crisis, while still giving students a reason to be hopeful about the future?

Ella Niederhelfman, a 15-year-old sophomore at Ipswich High School in Massachusetts, thinks teachers can help students move through fear to action. “I think with a shift in mindset in how we portray the subject—that every voice matters, that there is still time left—I think that will help in creating a new generation of changemakers,” said Niederhelfman, who is part of her community’s youth-led green team which works on environmental protection projects.

Worster’s classes work on a student-produced podcast that educates about climate change and interviews experts about how to tackle the problem. The project makes them feel like they’re part of the solution, and not “paralyzed by fear,” he said.

Other teachers, and even school districts, are taking this approach, too: focusing on solutions, and even reasons for optimism. Teaching this way offers an opportunity to discuss science and engineering practices, but it can also offset students’ sense of hopelessness, educators say.

“When you look at it through that lens, taking action becomes a critical aspect of student well-being and mental health,” said Maria Vamvalis, a doctoral candidate in curriculum and pedagogy at the University of Toronto, who studies climate change education.

One strategy: focus on local problems, local solutions

In its [position statement on teaching climate science](#), the National Science Teaching Association says that lessons should include discussion of how to address the problem—recommending that teachers “analyze different climate change mitigation strategies with students, including those that reduce carbon emissions as well as those aimed at building resilience to the effects of global climate change.”

And among teachers who cover climate change in class, most do spend at least some time talking about solutions. In a National Center for Science Education [survey](#) of middle and high school science teachers published in 2016, 88 percent said they talked about personal responsibility, like turning off lights or walking to school. The same percentage said they talked about how to make technologies more energy efficient.

Still, only 29 percent said that they talked about policy approaches, like cap-and-trade or carbon taxes.

The United Nations' IPCC report is clear that in order to stop the planet from getting hotter, countries will have to stop adding fossil fuel emissions and other greenhouse gases to the atmosphere—an outcome that experts say will require the use of policy levers. But talking about that reality can feel risky for science teachers who feel that they need to avoid politics in the classroom, said Glenn Branch, the deputy director of NCSE.

“Science teachers are mindful of the mores of their community. They don’t want to be seen as advocating for particular policies, especially in ways that their community may disagree with,” he said.

For this reason, some teachers focus on local problems and local solutions, rather than trying to engage students in national policy debates. Britney House, an 8th and 9th grade science teacher at Morris Area High School in Morris, Minn., has talked to her students every year about the effects of factory farming—large-scale agricultural production designed to maximize production and cut costs—on the environment worldwide.

But agriculture is central to the economy in her area of rural Minnesota, and students used to feel that the way she presented the issue painted their community as the problem. “They felt a little attacked,” she said.

Recently, she switched up her approach, inviting guest speakers from the county’s soil and water conservation department to talk with students about its efforts to address water pollution and soil erosion from agricultural land.

Some students come from families that have been farming for generations, so the class talks about how changing weather patterns have affected their livelihoods. And they focus on how their county is acting to address problems.

Young People Across the Globe Are Worried About Climate Change

A new study led by researchers at the University of Bath in England asked 10,000 teenagers and young adults about their feelings on climate change. Researchers surveyed 16- to 25-year-olds in 10 countries, including the United States. Results below indicate the percentage of respondents who agreed with the following statements:



Thoughts about CLIMATE CHANGE	All countries	USA
People have failed to care for planet	83	78
Future is frightening	75	68
Humanity is doomed	58	48
Less opportunity than parents	55	44
Most valued will be destroyed	54	47
Family security will be threatened	52	35
Hesitant to have children	38	34



Thoughts about GOVERNMENT RESPONSE	All countries	USA
Failing young people	65	63
Lying about impact of actions taken	64	63
Dismissing people's distress	60	59
Betraying me/future generations	58	66
Acting in line with climate science	36	28
Protecting me, planet & future generations	32	25
Can be trusted	31	31
Doing enough to avoid catastrophe	31	24
Taking concerns seriously enough	30	31

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SOURCE: Marks et al., "Young People's Voices on Climate Anxiety, Government Betrayal and Moral Injury: A Global Phenomenon"

"I try to focus more on our own community, because that's something they feel like they can have control over," House said. "They don't have control over what the United Nations does."

The Oceanside School District in New York is taking a similar approach, bringing global goals into a local context. Mitch Bickman, the director of K-12 social studies education in the district, is starting to write curricula around some of the United Nations' Sustainable Development Goals with his team. The district is working

with the Institute for Humane Education, which promotes a "solutionary" approach—teaching students how to identify "inhumane, unsustainable, and unjust systems" and work to better them.

Eventually, they want to host a "solutionary fair," during which students will present their proposed approaches for tackling community environmental problems in front of school and community boards that would have the power to implement their ideas.

Having students develop and pitch policy solutions makes confronting politics unavoidable. But Bickman hopes that the student-led nature of the projects will quell any notions that teachers are pushing an agenda. "When the kids are driving the conversation, the questions, and the work, it's pretty powerful, and it's generally something that parents are supportive of," Bickman said.

‘Solutionary action is a trauma-informed practice’

A focus on local issues can also help students emotionally process the ways that climate change is already affecting their lives. In San Mateo County, Calif., a fellowship program for current teachers takes a trauma-informed approach to environmental literacy.

Students in the area feel the effects of climate change on a regular basis, through wildfires, drought, and air pollution, said Andra Yeghoian, the county office of education’s environmental literacy and sustainability coordinator.

The training shows teachers how to connect these local issues to broader global trends and how to start conversations that give students room to share their fears, anxieties, and hopes. For example, Yeghoian said, classes might take a deep dive into climate data, exploring what higher temperatures or sea-level rise would mean for their county, specifically. Then, they’d open up 15 minutes or so for reflections, she said: “How does it feel to look at what sea-level rise looks like? How does it feel to think about the next 20 years like that?”

The fellowship trains teachers in the Institute for Humane Education’s solutionary approach, and prepares them to teach a project-based learning unit in which students examine an environmental problem and develop a solution.

“Just the idea of taking kids to solutionary action is a trauma-informed practice,” Yeghoian said. “It’s about empowerment.”

Niederhelman, the Massachusetts sophomore, said that knowing other young people in her community care about climate change—and knowing that they’re working together toward shared goals through organizations like the green team—helps her feel optimistic. “Since we have that foundation right now, we can easily build off of that,” she said.

For some students and teachers, it’s possible to engender this optimism about local actions. But is there a way for science classes to make students feel like solutions are possible on a global scale? At Carmel Catholic High School in Mundelein, Ill., Michelle Titterton is putting that question to the test.

Exploring solutions at scale

Titterton, the science department chair at the school, uses a policy simulator called En-ROADS as a teaching tool. The model allows users to design their own solutions to climate change, pulling on different policy and technology levers to see what changes they would effect.

Some K-12 teachers have brought it into science classrooms, but it's also been used in workshops with the U.S. Congress, the United Nations, banks, and universities. It was developed as a collaboration by the nonprofit think tank Climate Interactive, the software company Ventana Systems, and the Massachusetts Institute of Technology Sloan School of Management.

Coming into Titterton's classes, most of her students focus on individual contributions they can make to reduce their carbon footprint. "I'll have students talk to me about thrifting and composting," Titterton said, adding that some learn about these strategies through social media sustainability influencers on platforms like TikTok.

Curt Newton, the director of MIT's OpenCourseWare initiative and a facilitator with the En-ROADS program, said that it's common for high school students to come into the simulation focused on personal responsibility. Some of that has to do with media messages, he said: The idea of a personal "carbon footprint" was [popularized by British Petroleum in the early 2000s](#), as an advertising strategy to divert responsibility for fossil fuel use off of companies and onto consumers.

But in going through the En-ROADS simulation, students can see that relying on individuals to make greener personal choices isn't sustainable at scale. "You have a conversation about, 'What would it take for everyone across the world to make those choices?' And 'Why wouldn't they, or why couldn't they?'" Newton said. "Working with the model helps visualize the scale and scope of the changes that need to happen."

In Titterton's class, students model the effects of different changes—scaling back agricultural production, disincentivizing fossil fuel production, building more energy-efficient buildings—and discuss the pros and cons.

Once students have finished, Titterton asks them: What would you like most about living in this new climate scenario? And what have you learned? Students recognize that the road ahead is difficult and complex, Titterton said, but they also feel optimistic. They feel like getting there might actually be possible.

Titterton says students don't bring up partisan politics much in these lessons. "My two cents is this should not be political," she said. "Because we teach it in a science class, ... it's really not the focus of our conversations."

Joseph Henderson, on the other hand, thinks that schools should confront head on how political and economic interests shape our global response to the problem.

"There are a lot of power dynamics at play in terms of who is causing climate change," said Henderson, a lecturer at Paul Smith's College in New York who studies sustainability and science learning. "You have to ask the questions: Who is burning the carbon, and for what reason?"

Some classroom use of En-ROADS does explore these questions. One of the workshops Newton helps facilitate in schools assigns students to represent different actors in a fictionalized United Nations climate summit, such as conventional energy, clean technology, agriculture, world governments, and climate justice activists.

Having people take on the political identities of different interest groups can open students' eyes to how hard consensus building is, but also, what it looks like for opposing stakeholders to come together to achieve a goal.

The exercise leaves some students fired up, Newton said, having internalized the message that it's not too late to confront climate change—but that it's going to take a lot of work.

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