



NSTA Position Statement

The Teaching of Climate Science

<http://www.nsta.org/about/positions/climatescience.aspx>

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NSTA Position Statement

The Teaching of Climate Science

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Introduction

The National Science Teachers Association (NSTA) acknowledges that decades of research and overwhelming scientific consensus indicate with increasing certainty that Earth's climate is changing, largely due to human-induced increases in the concentrations of heat-absorbing gases (IPCC 2014; Melillo, Richmond, and Yohe 2014). The scientific consensus on the occurrence, causes, and consequences of climate change is both broad and deep (Melillo, Richmond, and Yohe 2014). The nation's leading scientific organizations support the core findings related to climate change, as do a broad range of government agencies, university and government research centers, educational organizations, and numerous international groups (NCSE 2017; U.S. Global Change Research Program 2017). According to the National Academy of Sciences, "it is now more certain than ever, based on many lines of evidence, that humans are changing Earth's climate" (NAS 2014). Scientific evidence advances our understanding of the challenges that climate change presents and of the need for people to prepare for and respond to its far-reaching implications (Melillo, Richmond, and Yohe 2014; Watts 2017).



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U.S. Global Change Research Program. 2017. Climate science special report: Fourth national climate assessment, Vol. 1 [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. Washington, CC: U.S. Global Change Research Program.

Framework for Teaching Climate 2007-Present

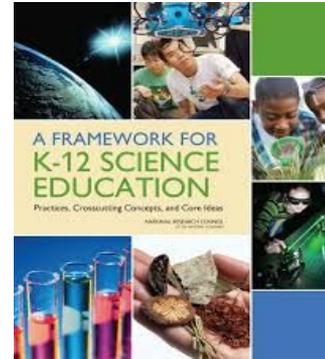
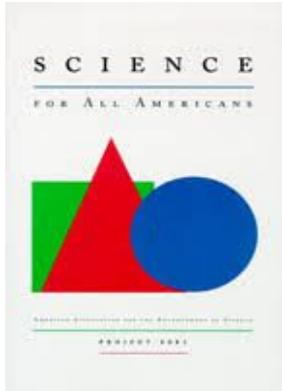
The science of climate change is firmly rooted in decades of peer-reviewed scientific literature and is as sound and advanced as other established geosciences that have provided deep understandings in fields such as plate tectonics and planetary astronomy. As such, A Framework for K–12 Science Education (Framework) recommends that foundational climate change science concepts be included as part of a high-quality K–12 science education (NRC 2012).

2007

2009

2012

2018



**NSTA Position Statement
The Teaching of Climate Science**

Introduction

The National Science Teachers Association (NSTA) acknowledges the need for a national effort to advance climate science literacy for all Americans. In 2007, NSTA published the report *Science for All Americans*, which called for a national effort to advance climate science literacy for all Americans. In 2011, NSTA published the report *A Framework for K-12 Science Education*, which called for a national effort to advance climate science literacy for all Americans. In 2018, NSTA published the report *The Teaching of Climate Science*, which called for a national effort to advance climate science literacy for all Americans.

Science is being prepared to not only deliver an appropriate climate change science, but also to ensure that students have a strong foundation in the basic concepts of science. This report calls for a national effort to advance climate science literacy for all Americans. In 2007, NSTA published the report *Science for All Americans*, which called for a national effort to advance climate science literacy for all Americans. In 2011, NSTA published the report *A Framework for K-12 Science Education*, which called for a national effort to advance climate science literacy for all Americans. In 2018, NSTA published the report *The Teaching of Climate Science*, which called for a national effort to advance climate science literacy for all Americans.

The science of climate change is being used to justify a wide range of policies and actions. It is important that all Americans have a strong foundation in the basic concepts of science. This report calls for a national effort to advance climate science literacy for all Americans. In 2007, NSTA published the report *Science for All Americans*, which called for a national effort to advance climate science literacy for all Americans. In 2011, NSTA published the report *A Framework for K-12 Science Education*, which called for a national effort to advance climate science literacy for all Americans. In 2018, NSTA published the report *The Teaching of Climate Science*, which called for a national effort to advance climate science literacy for all Americans.

Conclusion
NSTA recognizes that because of confusion and misinformation, many Americans do not have the scientific background knowledge to understand and act upon climate change. NSTA calls for a national effort to advance climate science literacy for all Americans. In 2007, NSTA published the report *Science for All Americans*, which called for a national effort to advance climate science literacy for all Americans. In 2011, NSTA published the report *A Framework for K-12 Science Education*, which called for a national effort to advance climate science literacy for all Americans. In 2018, NSTA published the report *The Teaching of Climate Science*, which called for a national effort to advance climate science literacy for all Americans.

References
National Science Teachers Association. "NSTA Position Statement: The Teaching of Climate Science." www.nsta.org/advocacy



Timeline for Advancing Climate Literacy in the Education Systems

NSTA Declarations

To ensure a high-quality K–12 science education constructed upon evidence-based science, including the science of climate change, NSTA recommends that teachers of science (sample declarations)

- deliver instruction using evidence-based science, including climate change, human impacts on natural systems, human sustainability, and engineering design, as recommended by the Framework for K–12 Science Education (Framework);
- advocate for integrating climate and climate change science across the K–12 curriculum beyond STEM (science, technology, engineering, and mathematics) classes;
- teach climate change as any other established field of science and reject pressures to eliminate or de-emphasize climate-based science concepts in science instruction;
- plan instruction on the premise that debates and false equivalence arguments are not demonstrably effective science teaching strategies;
- Many more...

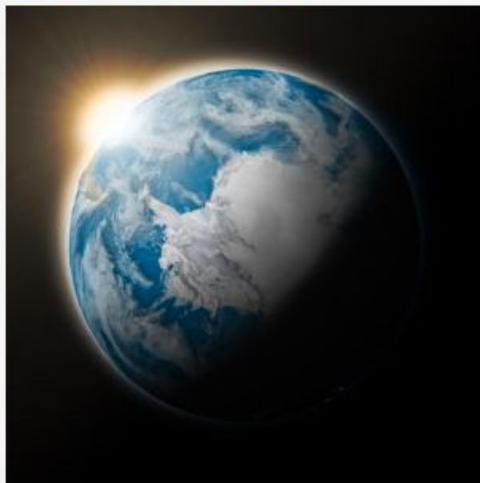
The Time Needed for Learning

Teaching about any form of human impact on Earth systems is most effective when encouraging students to approach the topic from the perspective of designing and revising mitigation strategies and solutions to problems, **not just focusing on the problems themselves.** Teachers require **sufficient time** to adequately plan instruction that supports student engagement with the complexity of climate change science, as well as adequate time for student understanding to progress from basic concepts to complex interactions.

Teaching Climate Science? Leading Teachers and Scientists Explain NSTA's New Position Statement and Answer Your Questions

 NSTA Reports

By *Cindy Workosky* | Published: September 14, 2018



NSTA recently issued a [position statement](#) calling for greater support for science educators in teaching evidence-based science, including climate science and climate change. The statement promotes the teaching of climate science as any other established field of science and calls on teachers to reject pressures to eliminate or de-emphasize climate-based science concepts in science instruction. The statement acknowledges the decades of research and overwhelming scientific consensus indicating with increasing certainty that

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Q&A with position statement panel members.

NSTA has asked a few members of the [position statement panel](#) to give science teachers further insights on important issues related to the teaching of climate science.

- **What are the key takeaways from NSTA's position statement on the teaching of climate science?** Eric J. Pyle, James Madison University
- **What challenges do K–12 teachers face teaching climate science and how can this statement help them?** Cheryl Manning, Past-President, National Earth Science Teachers Association, Science Teacher, Evergreen High School

Q&A with position statement panel members.

NSTA has asked a few members of the [position statement panel](#) to give science teachers further insights on important issues related to the teaching of climate science.

- **Can you clarify the difference between scientific argumentation and “debates” based on beliefs and opinions, not science?** Chris Geerer, 6th-Grade Science Teacher, Parcels Middle School
- **Do teachers have high-quality classroom resources to teach climate science effectively and where can they find them?** Frank Niepold, Senior Climate Education Program Manager, NOAA Climate Program Office

Q&A with position statement panel members.

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- **What special challenges and opportunities are provided by the interdisciplinary nature of climate change as a topic?** Don Haas , Director of Teacher Programming, The Paleontological Research Institution
- **What is the role of climate science in new science standards and what does the statement say about it?** Michael Wyession, Professor of Earth and Planetary Sciences, Washington University



Books & Resources

Climate Science Resources



› [NSTA Position Statement: The Teaching of Climate Science](#)

NSTA recently issued a position statement calling for greater support for science educators in teaching evidence-based science, including climate science and climate change. The statement promotes the teaching of climate change as any other established field of science and calls on teachers to reject pressures to eliminate or de-emphasize climate-based science concepts in science instruction.

Read the NSTA [press release](#).

Read a [Q&A](#) with position statement panel members.

See also:

[Climate Change Is a Thing. You Should Teach It, Science Teachers Group Says](#) (*Education Week's Curriculum Matters Blog*, September 13, 2018)



Books & Resources

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See also:

[Climate Change Is a Thing. You Should Teach It, Science Teachers Group Says](#) (*Education Week's Curriculum Matters Blog*, September 13, 2018)

[National Teachers Group Confronts Climate Denial: Keep the Politics Out of Science Class](#) (*Inside Climate News*, September 13, 2018)

Additional NSTA Resources

› [NSTA Position Statement: Next Generation Science Standards](#)

NSTA recommends the adoption and implementation of the *Next Generation Science Standards (NGSS)*. The NGSS include the study of climate change supporting Earth and Space Science performance expectations. One of the relevant disciplinary core ideas is stated as:

"Human activities, such as the release of greenhouse gases from burning fossil fuels, are major factors in the current rise in Earth's mean surface temperature (global warming)." (ESS3D)

Following are links to the weather and climate in the NGSS.

What does NGSS expect elementary students to know about weather and climate?

[Kindergarten](#) | [3rd Grade](#) | [5th Grade](#)

What does NGSS expect middle school students to know about weather and climate?

[Weather and Climate](#) | [Human Impacts](#)

What does NGSS expect high school students to know about weather and climate?

[Weather and Climate](#) | [Human Sustainability](#)

› [NSTA Position Statement: Environmental Education](#) **UNDER REVISION**

NSTA's [position statement on environmental education](#) states: "NSTA strongly supports environmental education as a way to instill environmental literacy in our nation's pre-K–16 students. It should be a part of the school curriculum because student knowledge of environmental concepts establishes a foundation for their future

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Blick's Pick: O.M.G.



I really like this video for bringing our attention to something that we see all the time, but don't pay close attention to. I also appreciate that the researchers are pointing out that just because we see something many times, that does not mean that we understand or can replicate it. Practice is an essential part of learning. [YouTube link](#) | [Archive](#)

NSTA Podcasts

Lab Out Loud 192: A New NSTA Position Statement on Teaching Climate Science

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[Blick on Flicks: Biology, Physics, and Black Panther](#)

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› [NSTA Position Statement: Environmental Education](#) **UNDER REVISION**

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NSTA E-books

Enhanced E-books are highly interactive, self-directed learning experiences designed to augment understanding of science content and pedagogy.

- [Ocean's Effect on Weather and Climate](#) (See also: [Student Edition, Grades 6–12](#))
- [Resources and Human Impact](#) (See also: [Student Edition, Grades 6–12](#))
- [Investigating Weather and Climate](#) (K–5 Elementary Edition)

NSTA Press® Books

- [Climate Change From Pole to Pole: Biology Investigations](#)
- [Global Climate Change: Resources for Environmental Literacy](#)—Environmental Literacy Council and National Science Teachers Association (NSTA)
- [Resources for Environmental Literacy: Five Teaching Modules for Middle and High School Teachers](#)—Environmental Literacy Council and National Science Teachers Association (NSTA)
- [Citizen Science: 15 Lessons That Bring Biology to Life, 6–12](#)
- [Uncovering Student Ideas in Earth and Environmental Science: 32 New Formative Assessment Probes](#)
- [Argument-Driven Inquiry in Earth and Space Science: Lab Investigations for Grades 6–10](#)

Want More?

The [NSTA Learning Center](#) contains the above resources, and thousands more, for science educators, including archived web seminars, virtual conferences, and comprehensive collections of resources organized by topic and grade level. Numerous collections can be found on climate science.

Register today to access the Learning Center and let NSTA guide you to the resources you want and need.

Additional Resources on Climate Science for Science Educators

- [An Exploration of Ideas Related to the Understanding and Teaching of Climate Science and Climate Change](#) (Eric Pyle, Frank Niepold, Don Haas, Michael Wyssession, and Cheryl Manning)
- [American Association for the Advancement of Science \(AAAS\)](#)
- [ClimateChangeLIVE](#)

[More info on this podcast](#) ›

[Lab Out Loud archive](#) ›

[Blick on Flicks: Biology, Physics, and Black Panther](#)

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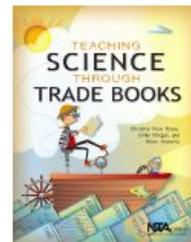
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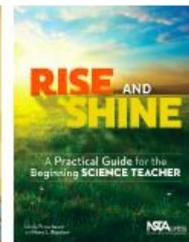
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Grades K-6
50 lessons that combine science teaching and reading instruction



Grades K-12
Helpful techniques, advice, strategies, and support for new science teachers

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- [An Exploration of Ideas Related to the Understanding and Teaching of Climate Science and Climate Change](#) (Eric Pyle, Frank Niepold, Don Haas, Michael Wyssession, and Cheryl Manning)
- [American Association for the Advancement of Science \(AAAS\)](#)
- [ClimateChangeLIVE](#)
- [Climate Literacy Framework](#) (U.S. Global Change Research)
- [Climate Literacy & Energy Awareness Network \(CLEAN\)](#)
- [Made Clear](#)
- [Toolbox for Teaching Climate & Energy](#)
- [The National Academies](#)
- [National Aeronautics and Space Administration \(Resources for educators | Resources for Students\)](#)
- [Teaching Climate Change](#) (National Center for Science Education)
- [Defending Climate Change Education](#) (National Center for Science Education)
- [National Earth Science Teachers Association \(NESTA\)](#)
- [Windows to the Universe](#) (a project of the National Earth Science Teachers Association, sponsored in part by NSF and NASA, the AGU and AGI, and others)
- [Teacher-Friendly Guide to Climate Change](#) (Paleontological Research Institution)
- [National Oceanic and Atmospheric Administration \(NOAA\)](#)
 - [Teaching Science Using the National Climate Assessment](#)
- [Security and Sustainability Forum](#)

Resources for Parents and Community Members About Climate Science

- [U.S. Climate Resilience Toolkit](#)
- [Climate Change Indicators in the United States, Fourth Edition](#) (US EPA)
- [Environmental Defense Fund](#)
- [Climate Change 101: National Center for Science Education](#)
- [GlobalChange.gov](#)
- [Global Warming Primer](#)
- [National Oceanic and Atmospheric Administration \(NOAA\)](#)
- [Climate Voices](#) (science speakers network)
- [Kahoot Climate Challenge](#) (Columbia University and NOAA)

or results that combine science teaching and

teacher techniques, strategies, and support for new science teachers

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NSTA's Podcast on all things Science



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