# Climate Change and Science Teaching in K-8 Settings

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## Abstract

If we are to create a scientifically-literate populace prepared to build solutions to the problems we face related to climate change, then children, as future decision makers and voters, must be prepared with the appropriate knowledge and tools. Though New Jersey has adopted the Next Generation Science Standards (NGSS), which include specific guidance for teachers on topics related to climate change, the degree to which they have been implemented in K-8 classrooms varies considerably (Haag & Megowan, 2015; Harris et al., 2017). Further, climate science is sometimes viewed as controversial, and is an area in which teachers lack content knowledge; as a result teachers lack strategies for addressing climate change in their instruction (Hestness et al., 2011; Hestness et al, 2014; Plutzer et al., 2016).

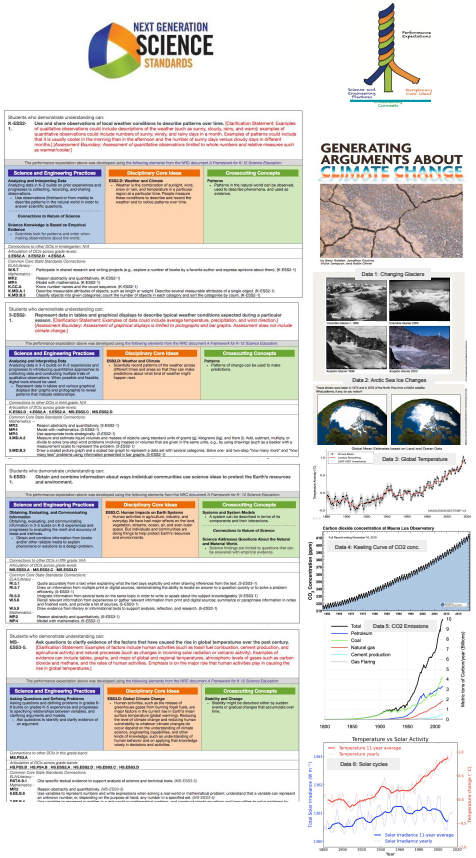
## Addressing the Standards

New Jersey has adopted the NGSS as the official state science standards used to determine what science content is (and isn't) covered in K-12 classrooms. Yet, studies show that teachers lack comfort with enactment of these standards. Though Climate Change as a standalone topic is not addressed in the NGSS until the Middle School level, many of the foundational ideas related to climate change are, as demonstrated by the standards excerpted.

## Three Dimensional Learning

The NGSS moved the vision for science teaching and learning away from rote memorization of isolated facts and proposed a three-dimensional model for learning. In this model, every performance expectation, or standard includes:

- **Disciplinary Core Ideas** or specific science content
- **Crosscutting Concepts** or connections to other related ideas across disciplinary boundaries
- **Science and Engineering Practices** or the methods and tools of doing science and engineering




## One Example Instructional Strategy

One strategy for engaging teachers and students with climate change is using scientific argumentation to support or refute claims about human-caused climate change. We use Golden et al' (2012) model to provide an overarching example.

## Practices

Practice 7 **Engaging in Argument from Evidence** requires students to use a Claims-Evidence-Reasoning model to support claims using data as evidence.


This activity uses several different types of evidence including images of melting ice caps, atmospheric CO2 temperature, along with sunspot data, providing a counter point to explore and build strong scientific arguments.

## Crosscutting Concepts

This Performance Expectation focuses in directly on the idea **Stability and Change**, providing an opportunity to recognize patterns and differences.

## Disciplinary Core Ideas

The DCI addressed directly in this standard is global climate change as related to human activities.

## Future Plans

Over the next several years, we will embark on a comprehensive project in partnership with Save Barnegat Bay we will begin a series of intensive professional development workshops partnering **preservice** and **practicing** teachers from across NJ focused on:

- Climate Change and its effects in NJ
- Effective use of the NGSS to plan science instruction
- Marine Science

## References

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