**The Causes of Climate Change**

**Overview & Concepts**

In this module, students will learn about climate forcings. Climate forcings are any factors that cause a change to Earth’s energy balance, which will ultimately lead to a change in global mean temperature (GMT) and global climate.

When you complete this module, you will be able to

* Explain natural causes of global climate change.
* Trace the flow of carbon through the carbon cycle.
* Explain the natural and human-related processes that cause increases and decreases in the concentration of greenhouse gases in the atmosphere.
* Explain how patterns (or fingerprints) can be used to identify the source of recent climate change.
* Explain the trends in carbon dioxide concentration over different time scales.
* Compare the changes in carbon dioxide and temperature over different time scales.
* Compare the changes in carbon dioxide concentration to changes in greenhouse gas emissions over the past 130 years.
* Compare climate models of observed temperature changes due to natural causes to those that include both natural and anthropogenic (human) causes.
* Describe the types of feedbacks (or processes) that amplify and reduce the changes in climate.

**Science Standards (Next Generation Science Standards, Sunshine State Science Standards, and Climate and Energy Literacy Principles)**

See website for standards addressed in the module.

**Suggested Scope and Sequencing of Module**

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| Inquiry Lessons | Photosynthesis and Respiration: How Snails and Plants Exchange Carbon Dioxide  A Sink for Carbon Dioxide: How the Oceans Absorb and Store Carbon Dioxide |
| Module Content | Guided Reading/Note-Taking, and PowerPoint Presentation |
| Investigations | Investigation 1: A Comparison of Carbon Dioxide and Temperature Before the Industrial Revolution  Investigation 2: Concentration of Carbon Dioxide Since the Industrial Revolution  Investigation 3: Climate Models of Observed Temperatures and Forcings |
| Argumentation Practice | Addressing Skeptics’ Claims about the Causes of Climate Change |
| Evaluation | Pre and Post Quiz Questions, Inquiry Lesson, Guided Reading/Note-Taking, and Argumentation Practice |