Curriculum Units by Fellows of the Yale-New Haven Teachers Institute
2021 Volume IV: The Earth's Greenhouse and Global Warming

# The role of carbon dioxide in our changing climate

Guide for Curriculum Unit 21.04.04
by Anna Newman

This unit will investigate the role of carbon dioxide in climate change. The first two lessons will focus on how carbon dioxide gets into the atmosphere. As part of learning about the carbon cycle, we will learn about additional ways that carbon enters the cycle through the burning of fossil fuels. Students will analyze graphs of carbon dioxide levels in the atmosphere over the last 200 or so years, identify patterns in the graphs, and make predictions about what will happen to carbon dioxide levels in the future if no changes are made to industry. Next, we will investigate how carbon dioxide and greenhouse gases increase the Earth's temperature. Through a simple experiment that models the greenhouse effect, students will develop a model that shows how the temperature of the earth has increased. Students will also analyze graphs of the temperature since the industrial revolution and make connections between the carbon dioxide levels and the temperature levels. The unit will then introduce the idea of climate sensitivity, a way to estimate the change in temperature due to increasing carbon dioxide levels. Finally, students will work in groups to develop a model of the role that carbon dioxide plays in climate change, using the content that they have learned about the carbon cycle, the effect of fossil fuels on the carbon cycle, and climate sensitivity models.

(Developed for Phy-Chem, grade 9; recommended for Physical Chemistry, Environmental Science, and Earth Science, grades 9-12)

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