



YALE NATIONAL INITIATIVE

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Curriculum Units by Fellows of the National Initiative
2013 Volume V: Energy Sciences

A Chemistry Perspective: Gasoline or Biodiesel?

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Energy. Where does it come from and why do we care? This unit is designed to help high school chemistry students see the relevance of chemistry to their lives and to encourage them to become critical thinkers and responsible citizens of their community. In this curriculum unit, students investigate the effects of energy use on the environment. Over the course of four weeks, students will explore parts of the California State Standards for chemistry under the sections titled "conservation of matter and stoichiometry" and "chemical thermodynamics." The theme of energy will tie together the standards for reactions, stoichiometry, and heat energy.

Specifically, students will investigate the chemical equations for the combustion of high octane gasoline and biodiesel in order to compare the energy output as well as the environmental effects of the two fuel types. The unit includes combustion demonstrations and the production of biodiesel from vegetable oil in the classroom. In addition, they will analyze scientific articles to develop their own opinions on the issue of energy consumption and conservation. As a culminating task, students will take on the role of different members of the community and pitch their own proposal for a solution to this energy problem.

(Developed for Chemistry and AP Chemistry, grades 10-12; recommended for Chemistry and Environmental Science, High School grades)

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