



# YALE NATIONAL INITIATIVE

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Curriculum Units by Fellows of the National Initiative  
2019 Volume IV: Energy Sciences

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## **Acids and Particulate Matter and Mercury, Oh My! An Examination of the Major Impacts of Coal on the Environment**

Guide for Curriculum Unit 19.04.02, published September 2019  
by Michael A. Doody

This two-week unit on the environmental impacts of coal is written for AP Environmental Science and satisfies the following learning objectives set forth by the College Board in the most recent version of the course and exam description: identify types of fuels and their uses, describe ecological impacts of natural resource extraction, describe the use of fossil fuels in power generation, describe the effects of fossil fuel use on the environment, identify the sources and effects of air pollutants, and describe acid deposition and its effects on the environment. Within this unit, students pay special attention to acid-mine drainage, particulate matter pollution and its impacts, and how mountaintop removal mining has altered the landscape of the nearby Appalachian region. Students complete several hands-on activities to advance their knowledge, including demonstrating the effects of acid-mine drainage and acid-deposition on plant life, measuring particulate matter pollution, and demonstrating the impacts of coal mining using a model system. Finally, as part of their AP exam preparation, students are charged with writing, answering, and scoring a Free Response Question as their summative assessment for the unit.

(Developed for AP Environmental Science, grades 11-12; recommended for Environmental Science Issues, grades 10-11)

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