



Curriculum Units by Fellows of the Yale-New Haven Teachers Institute  
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## Thermodynamics

Guide for Curriculum Unit 16.04.07  
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When an athlete performs a task, some of the energy being used turns into heat. That is why they feel hot afterward. This unit focuses on thermodynamics, a study of the relationship between energy, work and heat. Students will explore and study the laws of ideal gases, as well as the concepts of temperature, temperature scales and kinetic molecular theory. To enhance understanding, students will be introduced to the workings of a Stirling engine.

Each lesson will be accompanied by a lesson plan. Depending on the lesson, also included will be examples and applications (problems to be solved by students using the equations and concepts presented in the lesson).

The unit is intended to be taught in 10<sup>th</sup> or 11<sup>th</sup> grade Chemistry classes, but it can be used also by middle school 7<sup>th</sup> and 8<sup>th</sup> grade teachers to expose students to concepts like temperature, pressure, volume and ideal gas laws. Although the primary focus of this unit is Chemistry, the lessons and concepts of this unit can be used in Physics, Physical Science and Math classes to introduce and familiarize students with these concepts. Student understanding will improve in relation to vocabulary, computation skills, problem solving skills and comprehension levels. Many strategies, examples and applications will be brought out and explained in the unit. The unit will last approximately three weeks.

(Developed for Engineering, grade 8; recommended for Chemistry, Physics, grades 10-11)

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