Physics of Music: Making Waves in a Science Classroom

Rosalind Echols
University City High School

Abstract

This unit is designed to fit in with the School District of Philadelphia Core Curriculum for 9th grade Physical Science in Unit 7 on Waves. In the curriculum, this unit is allotted four weeks, in which students study the nature and properties of waves with specific applications to light and sound waves. This curriculum unit will consist of a 3-week unit focused on sound waves and specific applications to the design of several families of musical instruments used in a number of genres. During this unit, students will be introduced to the basic properties of waves through a variety of inquiry-based and analytical activities, and will then use this solid conceptual understanding to explain the behaviors of sound, particularly in the case of musical instruments.

Depending on the exact nature of the curriculum, elements of this curriculum unit could be used in eighth grade Physical Science or as part of a more advanced physics curriculum in the upper grades. Some of the topics covered may be slightly more advanced than a middle school level or lower level for the later high school grades, but the general structure should be useful. The level of questioning in the inquiry activities or the amount of math used throughout could be tailored to the appropriate student level. Much of the material is also designed to be easily differentiable for learning styles and reading and math levels. The unit could be extended to include other topics such as history and music in order to present a coherent inter-disciplinary study.