

Abstracts of Curriulum Units "From Braque to Bach to Bohr: Physics and the Arts"

The Physics of Music

Carolyn Renee Darden

This curriculum is designed to integrate science and music. Giving children opportunities to use hands-on activities and concrete conceptual models of how sound works and to transfer this knowledge to the music that they all love is vital to education. Making science both fun, interesting and educational is the goal. My hope is that this will ignite the imaginations of my students who come from diverse and economically challenged homes. The purpose of this curriculum is to make science a little more user friendly. Teaching them that science touches their lives even when they are not in school is important. Physical Science can, for many people, be quite uninspiring. Most students today are bombarded with many different types of entertainment and media. With the use of computers, video games, Gameboy and other types of games, many children have lost the curiosity of the exploring the "real" world and do not explore with simple objects. This is an opportunity for students to "play" in classand learn.

Are You Seeing What I'm Seeing?

Explaining Light, Color, and Perception Using Illusions and Art in a Middle School Curriculum

Keith Gaudet

Art has been around for as long as people had been wandering the earth. Art takes many forms: drawing, painting, sculpture, architecture, music, literature, drama, dance, languages, history, and philosophy. Since art is so vast in content and intertwined with humanity, it would only be logical to combine it with any of the core subject areas (math, science, language arts, and social studies). Since I teach math and science, I will focus on how one can integrate math and science with art. One unit that is focused on in seventh grade is light and color. Since this is such a visual concept, I wanted to think of ways to show how artists use their knowledge of light and color in their work. I thought illusions in art would be a good way of talking about the concepts of light and color; thus the topic of this curriculum will be how to explain perception using illusions and art in a classroom.

The target audience for this curriculum is 7th grade math and physical science students. This unit can be taught as a thematic unit. The science topic being stressed is light and color and can be integrated with math skills such as pattern recognition. Educators can adapt these lessons for use across all core subject areas.

Though this unit will focus on the middle school levels, high school teachers can modify this with Physics, Biology, American and World History courses. I have also designed the lesson plans so that they will meet the needs of LEP (Limited English Proficient), bilingual, and special education students. I have set up this paper in four major sections: Introduction to the Curriculum, The Host School Academic Setting, Scientific Background, and Implementation of Unit.

The Search for Humanity—Connecting Physics and the Arts in an American Humanities Class

Debi Kierst

The *zeitgeist* of early 20th century America is explored by comparing the ideas, creations and discoveries of scientists, visual artists, musicians, dancers and writers of the time. As an introduction to a unit culminating in the reading of Faulkner's *The Sound and the Fury*, Albert Einstein's discovery of the special theory of relativity will be compared with cubism and surrealism in art, and modernism in music, dance and literature, to find the similarities in the thought processes of the great minds and talents at the turn of the last century. The unit is intended for use in an advanced level American Humanities course that offers a non-traditional approach to the required courses of American Literature and American History at the 11th grade level. Through exercises involving written and verbal response in individual and group work, students will work to identify the general trend of thought or feeling characteristic of early 20th century America. Additionally, by incorporating scientific thought in this process, students will be able to see the interconnectedness of all areas of study.

Teaching the Physics of Light through Inquiry

Diane Kraus

This unit is designed for a middle school physical science class. Teaching the Physics of Light Through Inquiry is designed to motivate students by using a hands-on approach. Light is a very attractive and understandable subject for students, and the study of light is becoming a part of many science courses designed for future elementary and secondary science teachers. This unit discusses the work of L.C. McDermott who developed an inquiry approach for teaching physics. Her method included a pre-test, tutorial and post-test. Students will begin by exploring how waves are related to energy. The students will describe the characteristics of waves and classify waves. Waves will be used to help students understand reflection, refraction and diffraction. Finally, students will use a ray model of light to explore light and shadows. This is a three to four week unit. Students will keep a notebook to record their observations, questions and lab results.

