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Curriculum Units by Fellows of the National Initiative

2008 Volume IV: Bridges: The Art and Science for Creating Community Connections

The Art, Science, and Mathematics of Bridges: An Integrated Unit for Middle School

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by Joan Henderson

This unit on bridges, good for grades 5-9, will address through a history of great thinkers the development of understandings about forces and give students a variety of opportunities, including hands on activities, to demonstrate and experience the dynamics and equilibrium of forces in bridge structures. It creates opportunities to develop understanding of balancing equations through looking at and working with cantilever bridges and the concept of equilibrium, and integrates the application of cross multiplication. Additional activities address proportion and measurement through students' scaled bridge and truss drawings, and graphing through plotting the stress vs. strain of fishing line. Students will begin to work with the following science concepts: force, compression, tension, stress, strain, elasticity, and plasticity. Finally, this unit on bridges develops students' understanding of how math and engineering is used in the real world through examples, hands-on experience, and interacting with architects and engineers.

(Developed for Math, Pre-Algebra II, and Algebra I, grade 8; recommended for Science and Math, grades 5-8)

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