

Pushing the Envelope

National Standards

Grades 6 - 8 Mathematics

Source: NCTM National Standards Mathematics 2000

Lesson/Activity	Grades 6 - 8 Mathematics Standards
Types of Engines (pgs. 11-23)	solve simple problems involving rates and derived measurements for such attributes as velocity and density.
Chemistry (pgs. 25-41)	understand relationships among the angles, side lengths, perimeters, areas, and volumes of similar objects;
Chemistry (pgs. 25-41)	use two-dimensional representations of three-dimensional objects to visualize and solve problems such as those involving surface area and volume;
Chemistry (pgs. 25-41)	understand, select, and use units of appropriate size and type to measure angles, perimeter, area, surface area, and volume.
Chemistry (pgs. 25-41)	select and apply techniques and tools to accurately find length, area, volume, and angle measures to appropriate levels of precision;
Chemistry (pgs. 25-41)	develop strategies to determine the surface area and volume of selected prisms, pyramids, and cylinders;
Physics and Math (pgs. 43-63)	understand and use ratios and proportions to represent quantitative relationships;
Physics and Math (pgs. 43-63)	develop, analyze, and explain methods for solving problems involving proportions, such as scaling and finding equivalent ratios.
Physics and Math (pgs. 43-63)	relate and compare different forms of representation for a relationship;
Physics and Math (pgs. 43-63)	identify functions as linear or nonlinear and contrast their properties from tables, graphs, or equations.
Physics and Math (pgs. 43-63)	develop an initial conceptual understanding of different uses of variables;
Physics and Math (pgs. 43-63)	solve problems involving scale factors, using ratio and proportion;

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Grades 9 - 12 - Mathematics

Source: NCTM National Standards Mathematics 2000

Lesson/Activity	Grades 9 - 12 Mathematics Standards
Chemistry (pgs. 25-41)	understand and use formulas for the area, surface area, and volume of geometric figures, including cones, spheres, and cylinders;
Physics and Math (pgs. 43-63)	understand vectors and matrices as systems that have some of the properties of the real-number system;
Physics and Math (pgs. 43-63)	understand relations and functions and select, convert flexibly among, and use various representations for them;
Physics and Math (pgs. 43-63)	interpret representations of functions of two variables
Physics and Math (pgs. 43-63)	use a variety of symbolic representations, including recursive and parametric equations, for functions and relations;
Physics and Math (pgs. 43-63)	approximate and interpret rates of change from graphical and numerical data.
Physics and Math (pgs. 43-63)	understand and represent translations, reflections, rotations, and dilations of objects in the plane by using sketches, coordinates, vectors, function notation, and matrices;