
SYNOPSIS:

This program starts by comparing scientists and engineers and goes on to show what engineers do, how they do it and what tools are involved. The educational requirements for becoming an engineer and future prospects in the field are discussed.

CURRICULUM UNITS:

Chemistry
General Science
Mathematics
Computer Science
Industrial Arts
Physics

CAREER OPPORTUNITIES:

Architect
Automotive Engineer
Chemical Engineer
Civil Engineer
Electrical Engineer
Mechanical Engineer
Aeronautical Engineer

PROGRAM OVERVIEW:

Discuss how various scientific laws and principles (such as Archimedes' Principle, Newton's Laws of Motion, The Law of Gravity) are being applied in mechanical engineering today. Discuss the role that various branches of mathematics (algebra, trigonometry, calculus, geometry and statistics) play in the solution of engineering problems.

ISSUES AND CRITICAL THINKING:

- 1) Conduct a contest to see how can design and build a bridge with the highest strength-to-weight ratio.
 - a) The bridge must be long enough to span a 12-inch gap between two tables.
 - b) The bridge must be between 1 and 2 inches wide.
 - c) The bridge must be constructed out of either wood strips and/or paper and be held together with glue.
 - d) The bridge must have a hook in the center of the span for attaching test weights

- 2) After the contest, discuss the results and compare how the lighter paper bridges did against the heavier wooden bridges. Also discuss the winning design to determine why it was successful.

ALGEBRA- The branch of mathematics dealing with the solution of equations for one or more unknowns.

CALCULUS- A branch of mathematics dealing with two main operations – differentiation and integration.

COMPOSITES- A variety of new materials that are made of two or more types of fibers and resins.

INTEGRATED CIRCUIT- An electronic component that combines many transistor circuit elements of the same or different types of a single silicon chip.

PROTOTYPE- A product or components, which is produced in limited quantity, for use in testing and evaluation.

STATISTICS- A branch of mathematics that deals with probabilities based on historical data.

STRUCTURAL ANALYSIS- A branch of engineering that examines materials, construction methods and designs to determine their limits.

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TMW MEDIA GROUP

2321 Abbot Kinney Blvd., Venice, CA 90291

(310) 577-8581 Fax (310) 574-0886

Email: sale@tmwmedia.com

Web: www.tmwmedia.com

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