



This module meets the following National Standards of Learning

National Science Education Standards: Physical Science

Grades 6–12

Science as Inquiry

- Identify questions that can be answered through scientific investigations.
- Use appropriate tools and techniques to gather, analyze, and interpret data.
- Use technology and mathematics to improve investigations and communications.
- Think critically and logically to make the relationships between evidence and explanations.

Abilities of Technological Design

- Identify appropriate problems for technological design.
- Design a product.
- Implement a proposed design.
- Evaluate completed technological designs or products.

Activities

Activity 1: Structural Concepts

Activity 1 is an interactive computer-based introduction to the basic concepts employed by a structural engineer when designing and building bridges.

Activity 2: Beam Me Up

Activity 2 involves three in-class demonstrations that illustrate some of the key structural concepts that are essential to understanding how basic bridges behave.

Activity 3: Bridge Analysis

Activity 3 consists of two parts. The first part serves as an introduction to the theory behind how engineers determine how much force is transferred to each member of a truss from the force applied to the structure. The second part of Activity 3 gives the students an introduction to computer-based design.

Activity 4: Draft it Up!

Activity 4 is a drafting activity utilizing Bentley Microstation PowerDraft v8i software. This activity will provide students with a basic introduction to CAD software.

Activities 5 and 6: Basic & Improved Box Bridge Structures

Activities 5 and 6 allow the students to take part in hands-on activities that guide them through the process of building their own bridges, which they will test in class as part of a design competition.

The AASHTO STEM Outreach Solutions Program is a hands-on education outreach program designed for use in science, math, technology, and social science classes. By engaging students in solving real-world problems, sending volunteer mentors in the classroom, and supplying teachers with the needed materials. It connects K–12 students to the working world of transportation professionals and civil engineers, and inspires them to consider careers in these fields. The modules are designed for students in middle school and high school. The Roadways Into Developing Elementary Students module is designed for Pre K–8th grade and introduces elementary school students to basic transportation concepts.

Visit TRANSPORTATION.ORG/STEM-OUTREACH-SOLUTIONS to learn about the program.

AASHTO

AASHTO STEM Outreach Solutions Program Headquarters

555 12th Street, N.W., Suite 1000, Washington, DC 20004 • Telephone (202) 624-5800