

SCIENCE MUSEUM OF MINNESOTA ENGINEERING RESIDENCY, GRADES K-2



Class sessions & Logistics

Overview

Students perform hands-on investigations to develop deeper understanding of principles introduced in the Engineering K-2 Assembly in two different sessions. Each session is taught independently of the other.

Bridge Builders Session

Students apply the Engineering Design Process (Ask, Imagine, Plan, Create, Improve) to solve the problem of building a bridge that can span a roadway and/or support the weight of a model car. They use foam blocks of a variety of shapes and sizes that stick together with water. Teams of two experiment with the properties of the blocks and of bridges, share their best solutions, and then build their final bridge based on class recommendations of what make a bridge wide enough and strong enough.

Mitten Makers Session

Students use the Engineering Design Process (Ask, Imagine, Plan, Create, Improve) to design a mitten that is warm, water resistant and flexible. Pairs of experimenters conduct tests with a variety of fabrics to gather information of the properties of the fabrics and evaluate the test results. Then they design a “best” mitten that meets all criteria and share the process and decisions that led to their design.

Science Learning Goals

- Engineers use math, science, and creative thinking to design solutions to problems.
- Conduct experiments to facilitate understanding of how water can change forms.
- Engineers test and observe solutions to see how well they solve a given problem.

Vocabulary Introduced:

- Engineering,
- Technology

Program Length: 50 minutes

Audience Size: Up to 30 students

Preparation: Science Museum instructor brings all needed equipment and materials. School provides two tables for assembly demonstration and access to electricity. Allow 60 minutes before and after program for set-up and take-down. School provides classroom space for the residency sessions. Materials can be moved from room to room, or taught in a designated space with tables and chairs for students and two tables for teaching materials and equipment.

If you have further questions on bringing programming to your school, please contact our Outreach Registration Coordinator at (651) 221-4748 or schooloutreach@smm.org.

Standards

MN Academic Standard Strand

The Nature of Science and Engineering – The Practice of Engineering (0.1.2.1; 2.1.2.2.1; 2.1.2.3)

The Nature of Science and Engineering – Interactions Among Science, Technology, Engineering, and Society (1.1.3.2)

Next Generation Science Standards

Disciplinary Core Ideas:

Engineering Design – Defining and Limiting and Engineering Problem (ETS1.A)

Engineering Design – Developing Possible Solutions (ETS1.B)

Engineering Design – Optimizing the Design Solution (ETS1.C)

NGSS Crosscutting Concepts:

Structure and Function

Cause and Effect

Patterns

Systems and Systems Models

Connections to Engineering, Science, Technology and Applications of Science