SCIENCE MUSEUM OF MINNESOTA ENGINEERING RESIDENCY, GRADES 3-5

AIR DANCERS SESSION

Design teams create models of devices that would hold a person for a new amusement park ride. The rider is attached to the team's designed construction which they test in a column of rising air. Teams will use the Engineering Design Process (Ask, Imagine, Plan, Create, Improve) again and again as they strive for a design that balances the forces of gravity and air, and that meets the design criteria.

Program Length: Please allow 90 minutes for initial setup and 1 hour for final teardown. Allow for at least 10 minutes to reset between classes

Audience Size: Up to 30 students

Preparation: Science Museum Instructor brings all needed equipment and materials. This program requires at least 4-6 tables for instruction materials and it must remain in a designated space as it cannot be moved from room to room.

Science Learning Goals

- Engineers are people who solve problems creatively using their knowledge and understanding of math and science.
- Engineers use a design process to develop and refine multiple solution options to a problem. SMM uses the process of Ask, Imagine, Plan, Create, and Improve.
- Moving air can provide a force than can lift and support an object. Changing the object' shape, size weight and/or materials affects its motion.

Vocabulary Introduced:

- Engineering, Technology

Standards

MN Academic Standard Strand

Program supports Minnesota Academic Standards and Next Generation Science Standards, including disciplinary core ideas, science and engineering practices and crosscutting concepts. More details available upon request.

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.

SCIENCE MUSEUM OF MINNESOTA ENGINEERING RESIDENCY, GRADES 3-5

SUPER STRUCTURES SESSION

Different shapes have different strengths. Students can build shapes with strength by connecting dowels with rubber bands and use these shapes to construct either a tower or a bridge that supports weight. However, this is not possible with simple building techniques; the structures must be reinforced to be a "super structure."

Program Length: Please allow 45 minutes for initial setup and 30 minutes for final teardown. Allow for at least 10 minutes to reset between classes and 20 minutes if moving between rooms

Audience Size: Up to 30 students

Preparation: Science Museum Instructor brings all needed equipment and materials. This program requires at least 2 tables for instruction materials and it can be moved from room to room or taught in a designated space. An open space with minimal furniture is ideal.

Science Learning Goals

- Students experience the relative strengths of different geometric shapes and how well they respond to a load.
- Students work cooperatively to problem solve and apply their knowledge to engineer a solution to a problem.
- Geometric principles can be applied to help solve real-world challenges.

Standards

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