

Program Name: Construction Physics

Artist: Paige Ahlenius

Special Requirements:

A large empty area, classroom chairs, projector for PowerPoint (optional), and large books and plastic bins or cardboard boxes (optional). Teachers must be present at all times during workshops.

Workshop Description

Let your students be engineers for a day! This hands-on workshop is an excellent opportunity for students to explore physics and learn in a project-based environment. Students will explore the definitions of velocity, friction, gravitational pull and push, and energy. They will do all of this while experimenting in small groups. Students will work together and

actively participate in a challenge to build and test a structure and learn to appreciate the importance of trial and error and imagination. Educators can choose from one of the following challenges: roller coasters, skyscrapers, or balloon rockets. This group activity requires careful listening and respect for other ideas, a great team building opportunity!



Curriculum Connections & Educational Objectives

Students will:

- Work in groups to design and build structures.
- Learn trial and error and learn from their mistakes.
- Learn basic engineering principals.
- Engage in active listening.
- Understand the position and motion of an object can be changed by pushing or pulling.
- Move in different ways (straight line, zigzag, vibration, circular motion).



Artist Bio: Paige Ahlenius

Paige Ahlenius has been teaching in Kansas City since 1999. She started out as a scenic designer and has a Masters of Fine Arts in Scene Design from the University of Virginia. She has developed various process-based art, social studies and science arts integration programs for students

ages 3 through 18. Some of them include Construction Physics, Galimotos, The Magic of Science, and Portraits for Social Justice. Paige also facilitates STEM + Arts Integration workshops for students and professional development sessions for teachers.

Vocabulary

Physics: the study of how things work.

Aesthetics: beautiful; pleasing in appearance.

Construction: the building of something, especially a large structure such as a house, road, or bridge; the way in which something has been built, especially with regard to the type and quality of the structure, materials, and workmanship.

Experiment: an attempt to do something new or see what will happen: use of repeated tests and trials: the use of tests and trials in order to make discoveries.

Workshop Choices

Marble Rollercoasters: by hands on trial and error, the students will learn the principals of velocity, friction, kinetic energy, gravity, potential energy and rate of speed. Concepts: loops, corkscrews, struts and rails.

Skyscrapers: The students will learn the basics of building and designing skyscrapers. They will explore the impact that tornadoes and earthquakes can have. Concepts: Balance, weight, counterweight, suspension and support.

Balloon Blast: Students work as a team to build a simple machine to accomplish hitting a target across an 8ft span. Concepts: Acceleration, Mass, Velocity and Action Force.



Post-Workshop Activities

1. Make a parachute! Grab a plastic bag and cut out an octagon. Cut a small whole near the edge of each side. Attach 8 pieces of string of the same length to each of the holes. Tie the pieces of string to an object that could be used as a weight. Stand on a chair to drop your parachute and test how well it worked (it should fall slowly).

2. Use the following web resources for follow up activities that explore engineering and physics concepts.

- pbskids.org/designsquad/parentseducators/
- www.teachengineering.org/
- Childrensengineering.org

Contact KCYA for more information about this and other programs

816.531.4022
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