ESTABLISHING EFFECTIVE PARTNERSHIPS BETWEEN K-12 CLASSROOMS AND HIGHER EDUCATION

UNIVERSITY OF UTAH, COLLEGE OF ENGINEERING
OUTREACH MISSION

- Show real-world applications of science and math.
- Demonstrate ways engineers use science and math in their jobs.
- Serve as a resource for K-12 teachers to provide meaningful science and math activities.
TYPES OF PARTNERSHIPS

- **State:** Utah State Office of Education
- **District:** Canyons School District
- **School:** 2 Elementary, 2 Junior High and 2 High Schools
- **Federal:** Hill Air Force Base
HOW WE CHOOSE PARTNERSHIPS

• **State:** Serve as a resource to teachers

• **District:** Innovative science and math teachers

• **Schools:** Underrepresented student groups—low socioeconomic status, students of color and schools with low numbers in engineering

• **Federal:** Need for more engineers in the work force
As proposed by the project sponsor.  As specified in the project request.  As designed by the senior analyst.

As produced by the programmers.  As installed at the user's site.  What the user wanted.
THINK AHEAD

FACT: All needs will not be met.
LESSON: Learn to prioritize needs.

FACT: Your emergency is not necessarily my emergency.
LESSON: Be courteous and honest.

FACT: Surprises happen even with the best planning.
LESSON: Create a back-up option and always share with your partner organization.
FACILITATORS NOT GATEKEEPERS

FACILITATOR  GATEKEEPER
KNOWING HOW YOUR PARTNER ORGANIZATION WORKS IS THE KEY

Method of Processing Requests, Calendar Schedule, Organizational Chart, Financial Limitations, Personnel Constraints, Resource Capabilities, Stakeholders, Time Constraints, Scope of Influence, etc.
TEACHER RESOURCES

Lesson plans, Equipment, Activity check-out, Information on engineering programs

www.coe.utah.edu/k12/teachers
ENGINEERING ACTIVITIES

Brief Sampling of College of Engineering Activities Used with Partner Agencies
CATAPULTS

Age Group: 3rd - 12th grade

Used By: Science Classes, Math Classes, Engineering Clubs

Concepts: Physics

Description: Students build a catapult and test it. Different games and/or design considerations are introduced, depending on the age of the students.
HEART VALVE

Age Group: Junior High – High School

Designed for: Science and Math Classes

Concepts: Biology, Physics and Mass Flow Calculations

Description: Students build a valve that allows fluid to flow in one direction. The valves are tested from both directions. Students conduct a cost benefit analysis.
WIND TURBINES

Age Group: 7th-12th grade

Used By: Science Classes and after school programs

Concepts: Physics, Alternative Energy

Description: Students learn about wind energy and where it comes from. They work in teams to build wind turbine blades. Groups usually compete to light an LED and to generate the highest voltage.
COOKIE PROCESSING

Age Group: K-12th grade

Used By: Science Classes, Engineering Clubs

Concepts: Process Engineering

Description: Students learn that Chemical Engineers are responsible for mass production. They work in large groups to compete to see which group can make the most cookies that look the most consistent. Groups are responsible for creating their own process. This activity can be differentiated depending on the age of the students involved.
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