

It's All In The Family

Hosting Family Science & Engineering Events

National Science Teachers Association

San Francisco, CA

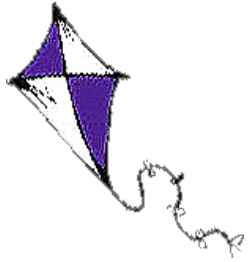
March 11, 2011

Presenters

David Heil, President, David Heil & Associates, Inc.
Founding President, Foundation for Family Science & Engineering
Principal Author, Family Science

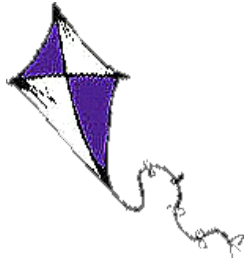
Mia Jackson, Associate, David Heil & Associates, Inc.
Principal Author, Family Engineering

www.familyscience.org
www.familyengineering.org



Parental Involvement Impacts Students' Academic Success & Career Choices

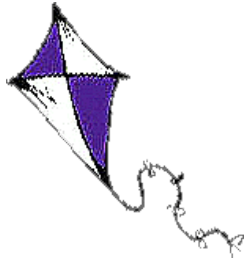
- Student's attitudes about science, math and careers are often formed before the high school years and are influenced by their parents' values.
- 70% of waking hours are outside of school.
- Family participation in education was twice as predictive of student academic success as family socioeconomic status.
- Most consistent predictors of academic achievement and social adjustment are parent expectations.
- Greater parental involvement results in increased confidence as science learners.



What are the Specific Goals of FAMILY SCIENCE?

To make science more accessible to families by offering:

- a non-threatening, hands-on approach to learning scientific processes, concepts and themes.
- cooperative learning activities which develop problem-solving, questioning and communication skills.
- strategies for encouraging all students to pursue scientific study.
- opportunities for families to participate in group science activities.



What are the Specific Goals of FAMILY SCIENCE?

To get parents more involved in their children's science education by encouraging:

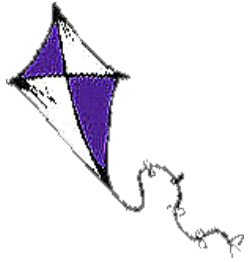
- participation in informal learning activities which supplement children's formal school science experiences.
- parental interest and involvement with school science curriculum.
- families to do science activities at home using inexpensive and readily available materials.
- adults and children to be partners in learning.



What are the Specific Goals of FAMILY SCIENCE?

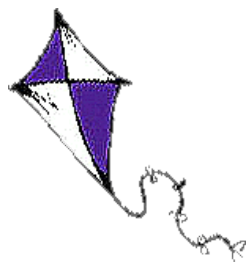
To demonstrate the relationship between science education and future career choices by providing:

- activities that highlight the relevancy of science to daily life.
- a forum for guest presenters to share information with families about various jobs and how they relate to science.
- a historical perspective on science discoveries that highlight various contributions of people from different cultures.



Family Science Supports National Standards & No Child Left Behind

- Science Literacy
- Unifying Concepts & Processes
- Science Inquiry
- Investigations
- Problem Solving
- Physical Science
- Life Science
- Technology & Design
- Career Awareness
- Science in Personal and Social Perspectives
- History and Nature of Science
- Supplemental Resources for Schools, Communities
- Parent Engagement and Choice



Sample Family Science Activity

Age:

8-13

Participants:

Group, Family, Pair

Supplies

- paper, a variety of types
- paper clips
- clear plastic cups
- small flashlight
- small portable mirror
- plastic soda straw
- sheet of aluminum foil
- tape
- balloons
- spoons
- rubber bands
- pencil
- string
- ruler
- resealable sandwich bags

Evidence, Please

Why

To test ideas and offer explanations for findings.

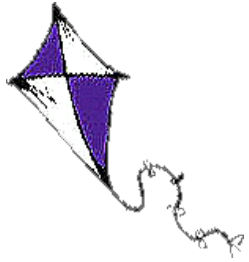
What

Scientists ask questions about the world around them and search for evidence to confirm their ideas. Evidence can support some things, but it may require ongoing investigation before a conclusion is reached. The challenge of this activity is to find evidence that demonstrates a science idea or concept for others using household items.

How

- Divide into teams. Collect one large set of supplies for the whole group. You may want to add other household materials to your supply list.
- Each team selects one of the topics on the *Evidence, Please List* to investigate using their collection of household materials (see page 90). For a challenge, one team can choose a topic for another team to investigate and demonstrate.
- Decide how much time you will have to investigate the selected topic, and prepare a demonstration of your evidence.
 - Use the *Evidence, Please List* for ideas on what evidence to demonstrate. Practice your demonstration to be sure it shows the evidence you want.
- Each team presents their evidence on the selected topic.
- During the presentations, record other science ideas you discovered on the *Evidence, Please List*.
- Add answered and unanswered questions to a Question Quilt (see page 86 for a full description of this activity).

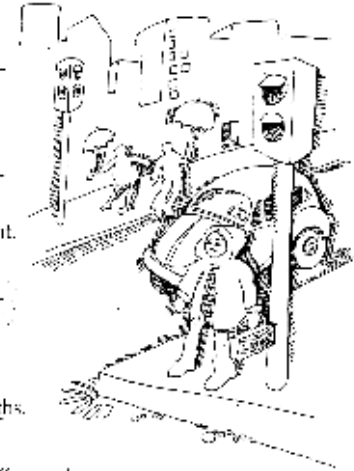


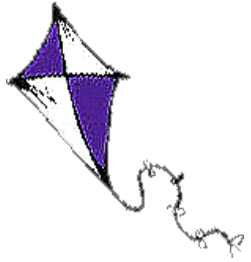


Teams Select From This List

Evidence, Please List

Topic	Properties to demonstrate as evidence
Air	Air has weight and takes up space. Air can move objects. Air pressure is reduced by moving air.
Friction	Friction produces heat. Friction causes objects to resist movement. Friction can produce static electricity. Wheels reduce friction.
Water	Water can be absorbed. Some substances dissolve in water. Stirring shortens the dissolving time. Water pressure is not the same at all depths.
Shadows	A shadow is cast when light is blocked. One object can cast shadows of many different shapes. The distance between the object and the light source affects the size of the shadow.
Sound	Vibrating objects produce sound. Objects can be identified using sound. Sound can move through solid objects.
Human Beings	The senses help people identify objects, substances and events. Thumbs give humans a manual dexterity advantage. People adjust their center of gravity to remain balanced.
Reflection	Reflection is one way light changes direction. A reflection of a reflection can be viewed. Images reflected in a flat mirror are reversed. The location of an image in a mirror depends on the distance of the object from the mirror.
Light	Light travels in a straight line. Light can be reflected.
Structures	A hollow structure can be light and strong. The stronger the structure the more weight it can support. The shape of a structure affects the rigidity and strength of the structure.





Looking for a new and different way to
spend time with your family?

Then check out...

FAMILY SCIENCE!

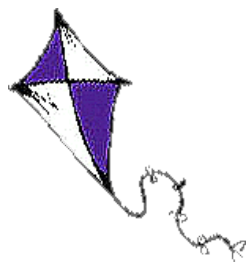
- * Work as a family and build your science skills.
- * Try hands-on activities that make learning fun.
- * Free admission. Treats!
- * All ages welcome.



Date:
Time:
Place:

FAMILY SCIENCE is sponsored by:

Sample Promotion for Local Event



Family Science Event

Sample Schedule: 7:00 - 8:30 p.m.

5:30 - 6:30	Event Set-Up
6:30 - 7:00	Registration/ Opener Activities
7:00 - 7:15	Continue Opener Activities
7:15 - 7:30	Welcome, Introductions
7:30 - 8:20	Facilitated Activities (2-3 max.)
8:20 - 8:30	Wrap-Up, Refreshments, Prizes
8:30 - 9:15	Event Clean-Up

COMING SOON – SPRING 2011

Family Engineering

For Parents & Elementary-Aged Children

Supported by the



National Science Foundation
WHERE DISCOVERIES BEGIN

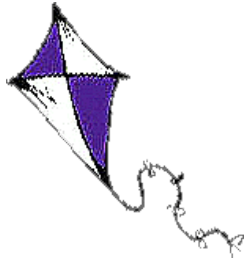
Michigan Tech
Michigan Technological University



Foundation For
Family Science



Foundation for Family Science & Engineering



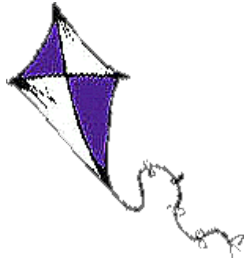
Family Engineering Program Goals

1. Engage families in engineering with fun, hands-on activities.
2. Increase public understanding and appreciation of the role engineering plays in everyday life.
3. Introduce children at an early age to the many career opportunities in engineering.
4. Increase parents' interest in and ability to encourage their children to pursue an engineering career.
5. Provide age-appropriate resources to support volunteers in conducting informal engineering education programs with elementary-aged children and their parents.



Family Engineering Supports Next Generation Science Standards & 21st Century Skills

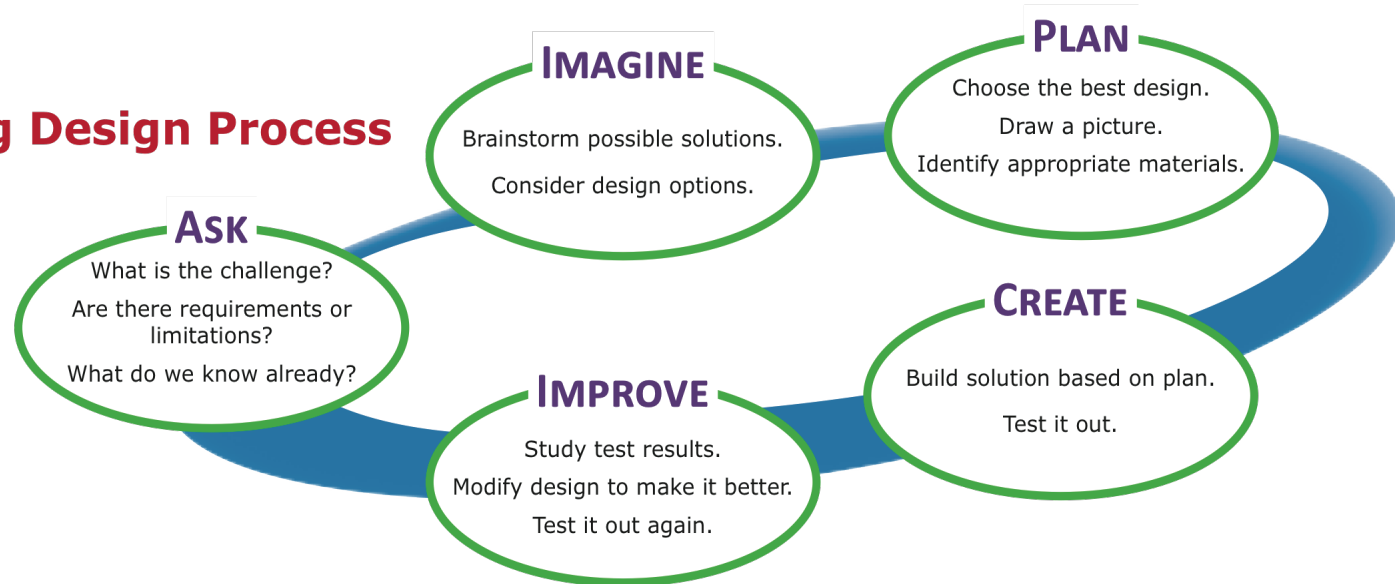
- Asking Questions
- Problem Solving
- Modeling
- Conducting Fair Tests
- Exploring Systems
- Form and Function
- Teamwork
- Engineering Design
- Communication
- Career Awareness
- Cultural Connections and Role Models
- Societal Impacts and Consequences
- Supplemental Resources for Schools, Communities
- Parent Engagement and Choice



Engineering Design Process

The Engineering Design Process is a series of steps that engineers use to guide them as they solve problems.

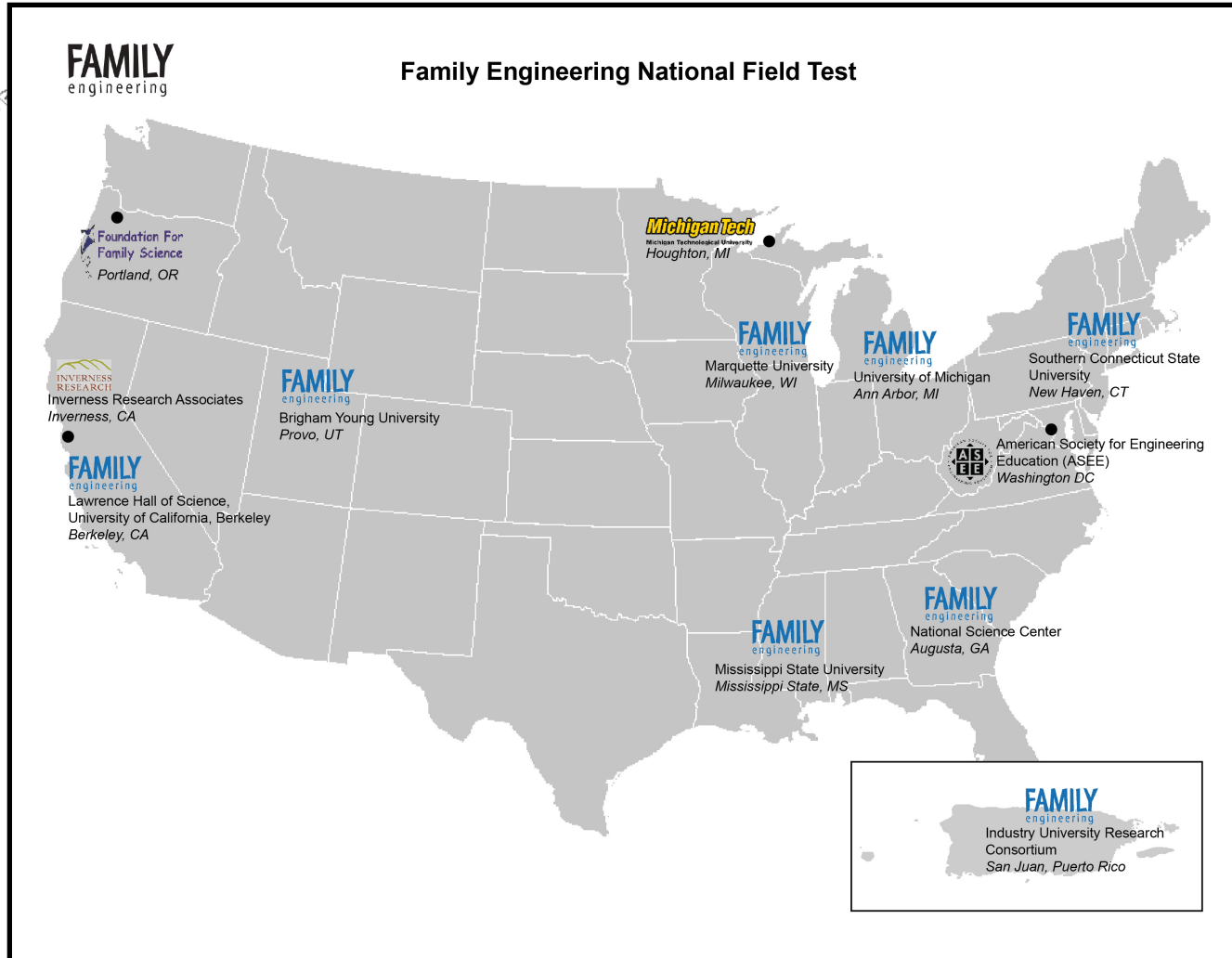
Engineering Design Process



Adapted From: Engineering Is Elementary

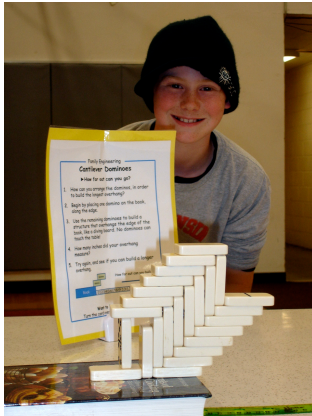


National Field Test Sites





What does a Family Science & Engineering Event look like?

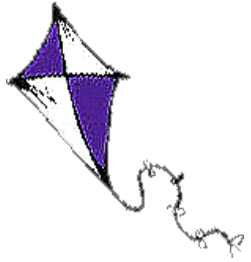


Self Directed Openers



Facilitated Activities





Getting Involved in Family Science & Engineering

Who Can Organize an Event?

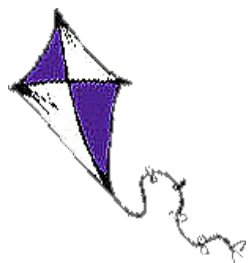
- Professional scientists & engineers
- College science and engineering (STEM) students
- K-5 classroom teachers and administrators
- Parent teacher organizations (PTA)
- High school science or engineering clubs
- Members of professional science and engineering societies
- Informal educators at museums, community centers, scouts, etc.
- Parents



How ?

- Obtain a copy of *Family Science* or *Family Engineering*
- Participate in Family Science & Engineering workshop
- Attend or host a Family Science & Engineering event





It's All In The Family

Hosting Family Science & Engineering Events

National Science Teachers Association

San Francisco, CA

March 11, 2011

Presenters

David Heil, President, David Heil & Associates, Inc.
Founding President, Foundation for Family Science & Engineering
Principal Author, Family Science

Mia Jackson, Associate, David Heil & Associates, Inc.
Principal Author, Family Engineering

www.familyscience.org
www.familyengineering.org