K-12 Outreach: Unique Contributions through AIChE and How YOU can get involved!

Katherine S. Ziemer
Associate Professor, Chemical Engineering
Northeastern University
September 23, 2009

AIChE®

Why Get Involved?

We need engineers to maintain and advance our technological innovation – our creative edge in facing societal challenges – our economic strength

"The key to educating students to thrive in this competitive global economy is introducing them to the engineering design skills and concepts that will engage them in applying their math and science knowledge to solve real problems. This is the way to harness the creativity of young minds. This is also the process that fuels innovation of new technologies."

Ioannis N. Miaoulis, Ph.D.
president and director of the Museum of Science, Boston
former dean of Tufts University's engineering school
6/09 article in ieee-usa today's engineer online

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Why Get Involved?

Pipeline for Workforce

2006 data from National Science Foundation Division of Science Resources Statistics: [www.nsf.gov/statistics/]

32.1 % of undergraduate degrees awarded in Science and Engineering

(4.6 are engineering degrees)

Lower and not that different from the most recent high value: 35.7% in 1969..... (5.7 are engineering degrees)

…. and we are not using our complete population….

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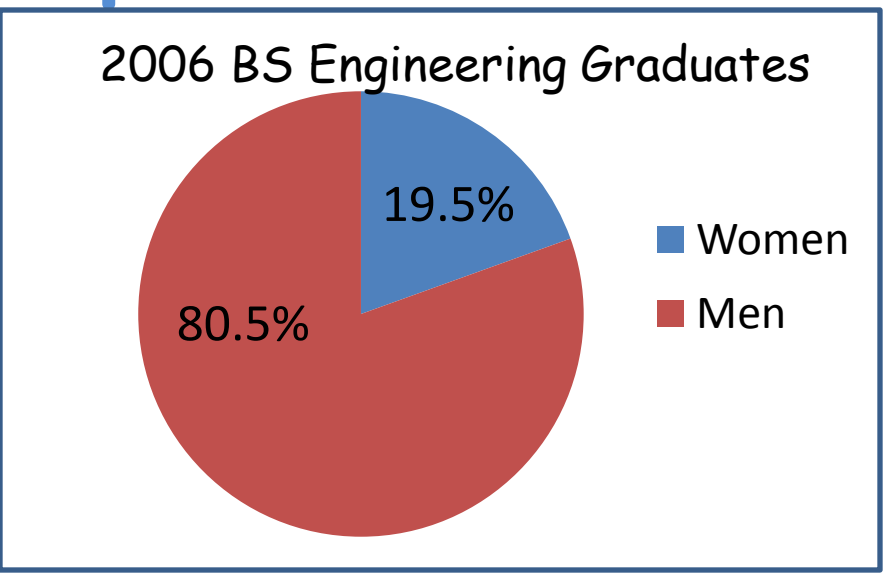
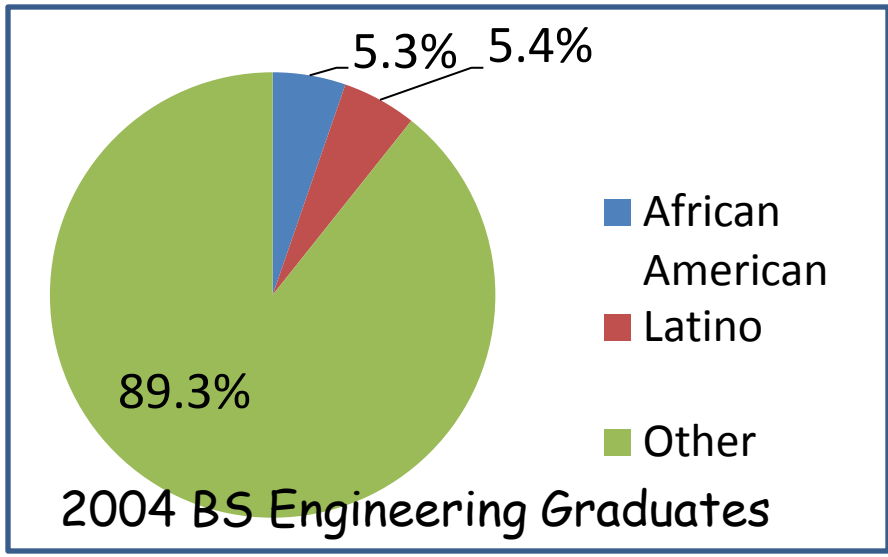
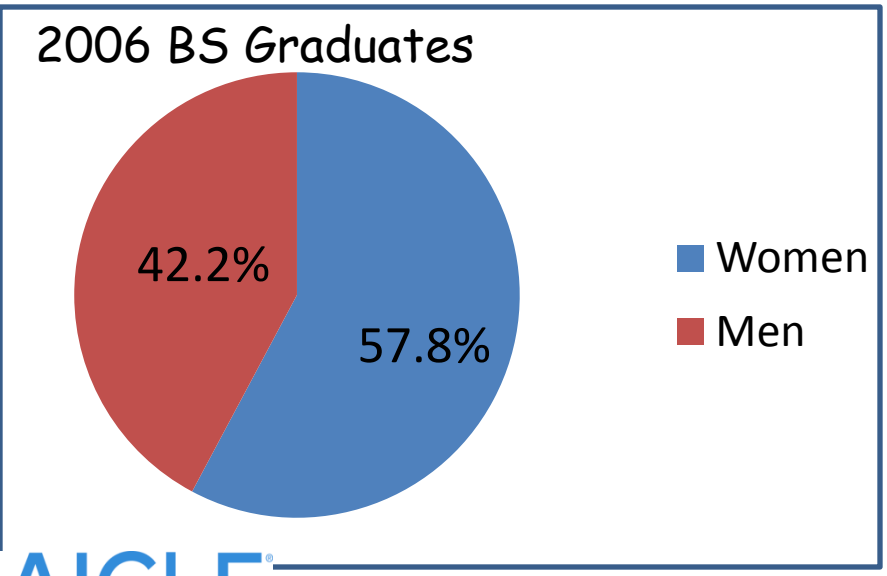
Why Get Involved?

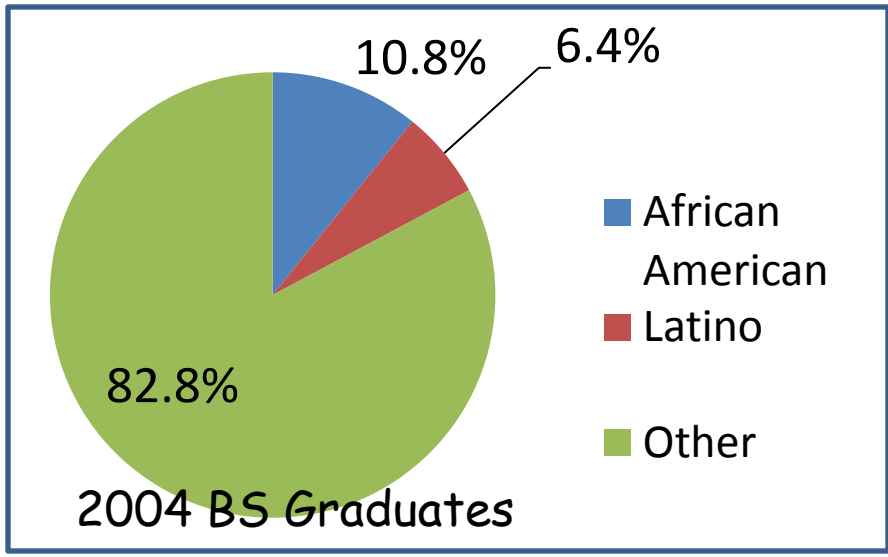
Pipeline for Workforce

www.nsf.gov/statistics/









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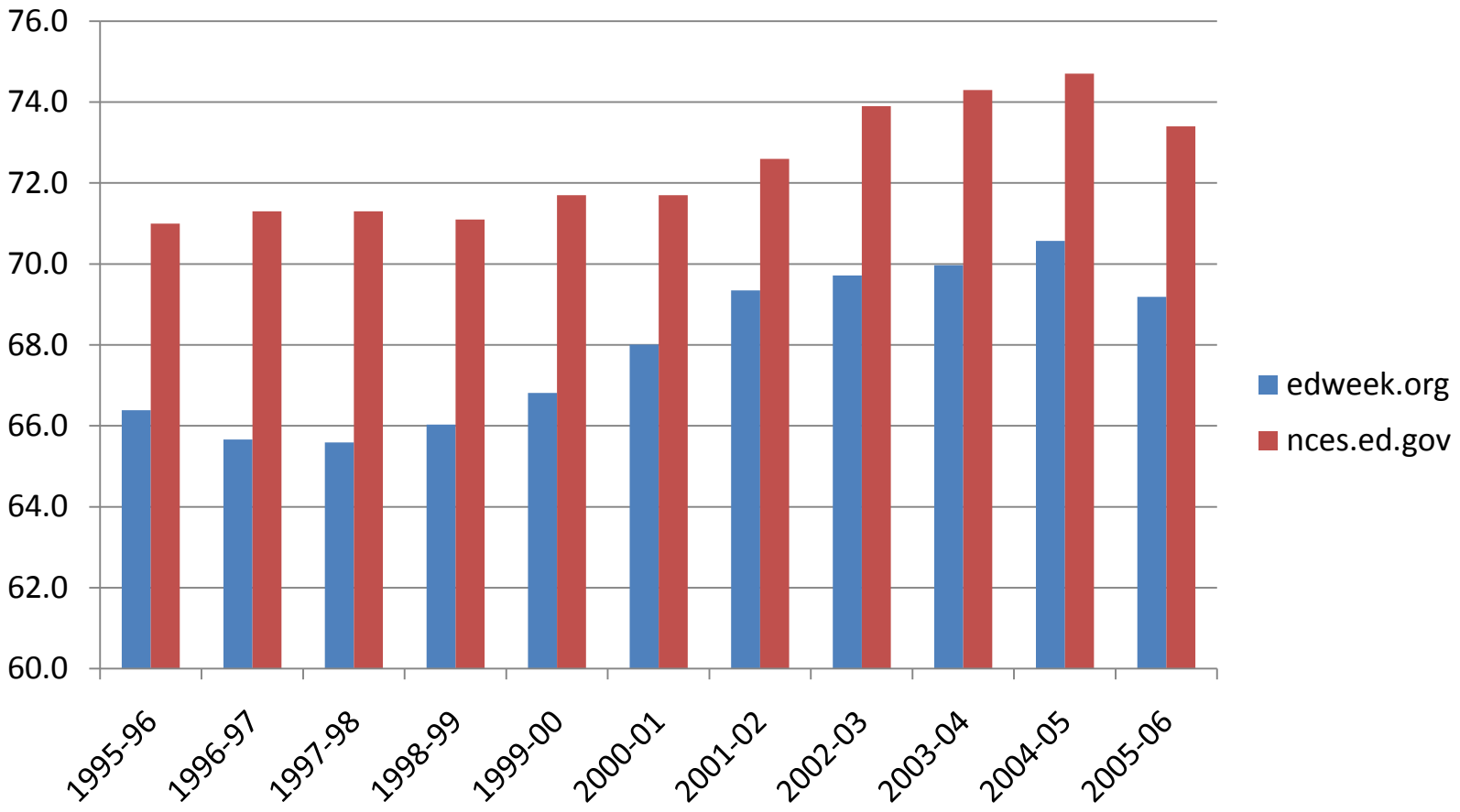
Why Get Involved?

Percent of freshman students who graduate from High School – Average across United States



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Why Get Involved?

We need a technically literate society

to maintain and advance our technological innovation – our creative edge in facing societal challenges – our economic strength

"Available evidence shows that American adults and children have a poor understanding of the essential characteristics of technology, how it influences society, and how people can and do affect its development……To take full advantage of the benefits and to recognize, address, or even avoid some of the pitfalls of technology, we must become better stewards of technological change. Unfortunately, we are ill prepared to meet this goal. This report represents a mandate—an urgent call—for technological literacy in the United States"

From: Technically Speaking: Why All Americans Need to Know More About Technology (2002)
National Academy of Engineering [http://www.nap.edu]

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Why Get Involved?

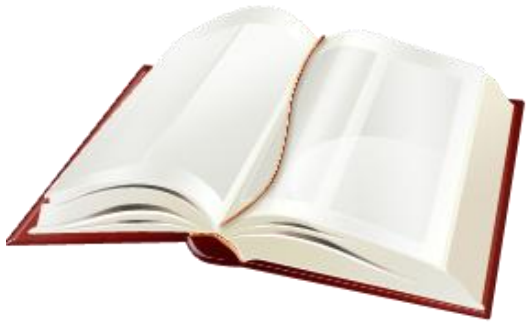
Education Standards

- State Standards

- National Coming??

http://www.nae.edu/cms/14729.aspx

Need engineer involvement to train and guide



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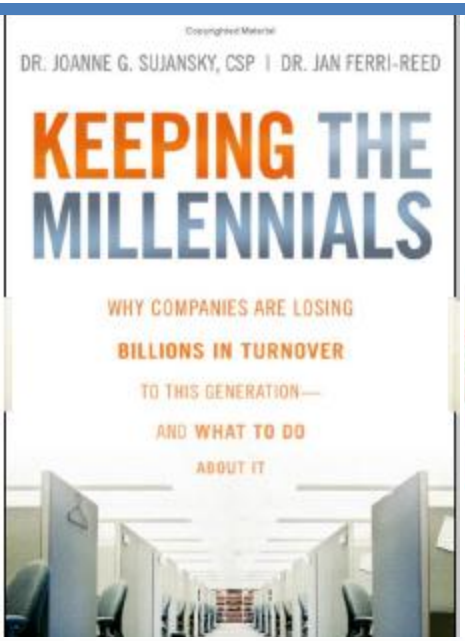
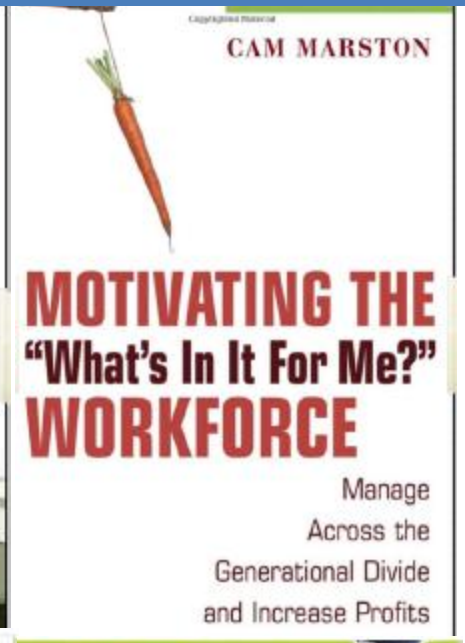
Benefits of K-12 Outreach

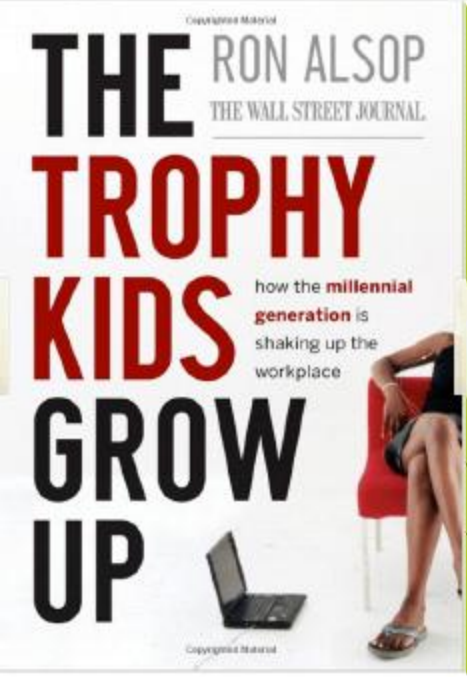
Companies and Professional Organizations

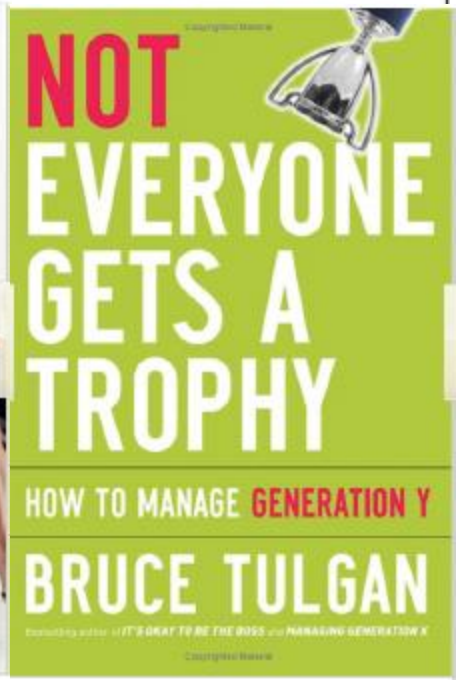
- Pipeline
- Societal Responsibility
- Employees Involved [Millennial Generation]

Engaging the Millennials









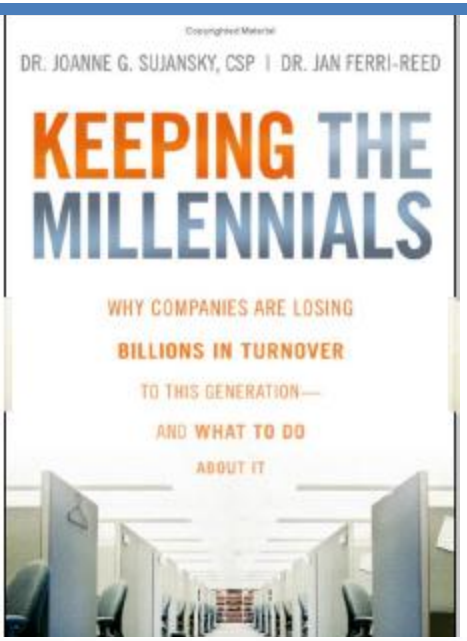
Who?

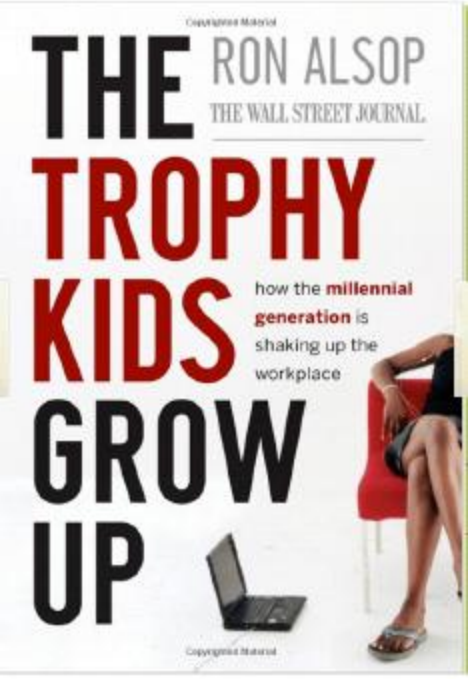
Born 1982 to 2000
75 Million people

Globally Common Characteristics including ……..

This section inspired by Scott Fogler, AIChE President and Professor at University of Michigan

Engaging the Millennials





Common Characteristics include:

- Their job does not define who they are
- Expect immediacy in everything they do.
- Feel they can get anything they want off the Internet.
- Multi-task – Look at CNN; hear comments, read text bottom of screen and listen to iPhone at same time.
- Connected via technology and not overwhelmed by information tidal wave
- Don't want to pay their on-the-job dues
- Social networking
- Altruistic

Benefits of K-12 Outreach

Teachers and Schools

- Hands-on, Interactive Learning
- Real World Connection
- Training Opportunities
- Role Models
- Standards

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ASEE ENGINEERING K12 CENTER

www.engineeringk12.org

- Engineering is **Academic Glue** – it binds complex math and science concepts to real-world experiences and leads to learning that sticks with students.
- Engineering is **Creativity** – the need for problem-solving and innovation brings out the best ideas from every student.
- Engineering is **Group Work** – students learn to communicate and work together while they learn math and science by applying engineering principles.
- Engineering is **Everywhere** – students learn that engineers have designed, created, or modified nearly everything they touch, wear, eat, see, and hear in their daily lives.
- Engineering is **FUN!**

Benefits of K-12 Outreach

Volunteers

- Impact local community
- Work to improve education for all
- Engaging learning experience
- Activity for local section or student chapter
- Fun!!

AIChE

You CAN make a Difference!

- Change attitudes about science and engineering
  - exposure to ideas and activities
  - role model
  - relate to experiences
- Reach underrepresented groups through target activities, language and use of role models
- Teacher knowledge and comfort level
- Longer term…. Harder to assess…..

  "What Good Is a Scientist in the Classroom? Participant Outcomes and Program Design Features for a Short-Duration Science Outreach Intervention in K–12 Classrooms", Sandra Laursen, Carrie Liston, Heather Thiry, and Julie Graf, CBE—Life Sciences Education, Vol. 6, 49–64, Spring 2007

What is Being Done in AIChE (or by AIChE members)

Curriculum Development & Dissemination

Teacher Development

Volunteer Development

Corporate Partnership Outreach

University Partnership Outreach

In-class interactions

After-School interactions




AIChE

UOP EWeek in Chicago

Courtesy Alan Zagoria Chicago Local Section

Local AIChE and Connections

- Hershey Company Shadow Programs-High School 10-12 grade, 15 years
- School Career Day programs-5th-12th grades, Presentation, Exhibit, or Panel Discussion
- Future City Competition, E-Week Sponsor and Exhibit Chemistry and Engineering-1000 students/parents
- Link with local after school groups: Scouting
- What-in-the World Career Program-Lancaster County-grades 5th to 6th
- Senior High School Annual Scholarship sponsor for south central Pennsylvania region

Courtesy Lou Felice and John McCormick,
AICHE SUSQUEHANNA SECTION

AIChE

Industry and University together…

The American Institute of Chemical Engineers
And The University of Illinois, Chicago
WELCOMES HIGH SCHOOL STUDENTS

- All day event
- Hundreds of students bused in
- Speakers
- Activities

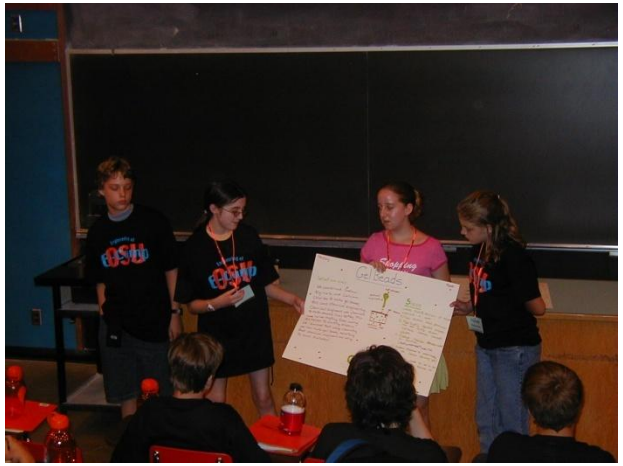
… a strength of local chapters and local young profesionals

Courtesy Alan Zagoria Chicago Local Section

University Connections/After School

Middle School Engineering Camp (E-Camp)

Girls and boy get a chance to learn about and experience hands-on engineering in a fun and supportive environment



Courtesy Skip Rochefort, Oregon State University

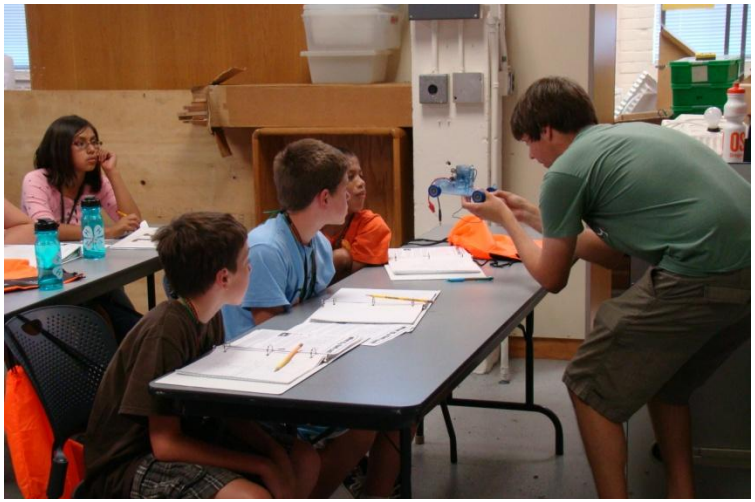
University Connections/After School

SKIES - Spirited Kids in Engineering and Science
provides many "wow" and "how" science and engineering experiences to the K-5 Student

AIChE

Courtesy Skip Rochefort, Oregon State University

University Students



Courtesy Skip Rochefort, OSU

- Energy K-12 Outreach Contest
- Curriculum Development
- Excited people ready to go

a Eniola Adefeso, Michigan

A great Resource of effective role models!!!

AIChE

Activities During School

Modules/Activities

Presentations

Need to be aware of local requirements …..
Direct teacher connections are always best….

AIC

Activities After School

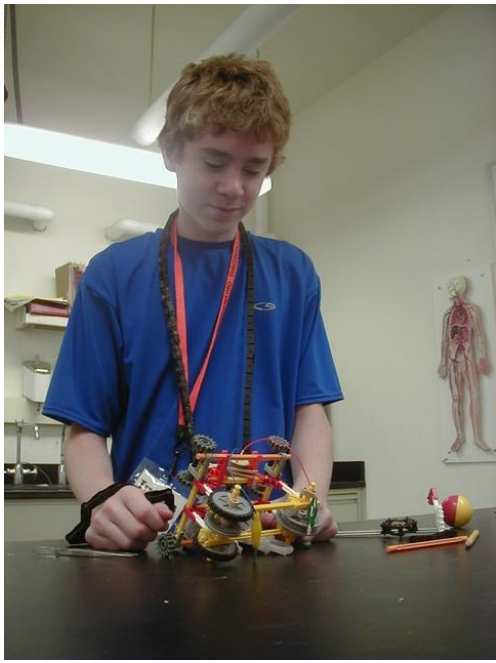
Museum Programs

Scout troops

YMCAs

Boys and Girls Clubs

Others…..



ANY activity will do…..

AIChE

What do I need to participate in Outreach?

A target audience and venue

A contact for the audience and venue

Materials and Instructions

Maybe a team of volunteers

Lots of energy and love of engineering

AIChE

How can I as an Individual Get Involved?

Contact an already active group in your area

Participate in National Programs

Use/Modify Established Material and Make your own Connections

Take advantage of available resources – especially in AIChE!

Resources for Getting Involved

Activity Outlines/Plans and "How Tos"

Some trusted online sites:

http://egfi-k12.org

http://www.teachengineering.org

http://www.engineeryourlife.org

http://aspire.swe.org

http://eweek.org

And coming soon….. k-12.aiche.org !!

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eGFI is proudly brought to you by the American Society for Engineering Education (ASEE). We are committed to promoting and enhancing efforts to improve K-12 STEM and engineering education.

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Overview Lesson Plans Class Activities Outreach Programs Web Resources Features K-12 News

Lesson Plans (36)
- Grades K-5 (6)
- Grades 6-8 (18)
- Grades 9-12 (11)

Class Activities (40)
- Grades K-5 (23)
- Grades 6-8 (25)
- Grades 9-12 (12)

K-12 Outreach Programs (127)
- Grades K-5 (32)
- Grades 6-8 (53)
- Grades 9-12 (101)

Web Resources (63)

Activity: Build a Hard Drive

Posted on September 16th, 2009 by als

In this two-hour activity for grades 7-9, students learn about the practical uses, structure, mathematics and terminology of the binary number system. They learn how to convert a given number from the binary to the decimal number system and vice versa, and perform binary addition and subtraction as part of a class game. They use this understanding to build their own simple, mechanical "hard drive" — a box that uses binary numbers to represent words for later retrieval.

Read More

Filed under: Class Activities | Comment »

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TEACH Engineering *Resources for K-12*

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EPSE

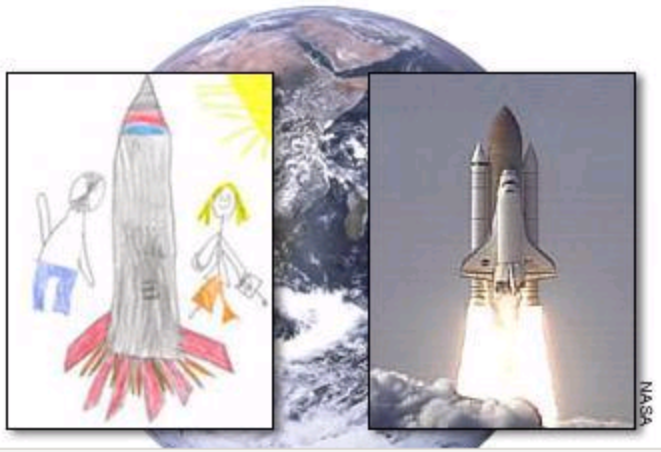
Welcome to the world of K-12 engineering education!

Now celebrating over 500 activities!

Engineers have a hand in designing, creating or modifying nearly everything we touch, wear, eat, see and hear. Introducing engineering into the K-12 classroom connects science and math concepts to the everyday engineering that surrounds us. This teacher resource, *TeachEngineering.org*, helps teachers enhance learning, excite students and stimulate interest in science and math through the use of hands-on engineering.

The *TeachEngineering* digital library provides teacher-tested, standards-based engineering content for K-12 teachers to use in science and math

Just a cute kid with a great imagination...
or an aspiring engineer who will shape our world?



TEACH Engineering Resources for K-12

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TE Subject Area: Science and Technology

Summary

The goal of engineering is to solve practical problems through the development or use of technologies. Technology/engineering works in conjunction with science to expand our capacity to understand the world.

Related Curricular Units

- Air Pollution
- All Caught Up: Bycatching and Design
- Biodomes
- Building Towards the Future
- Energy
- Environment
- Evolutionary Engineering: Simple Machines from Pyramids to Skyscrapers
- Exploring Solar Power
- Intro to Engineering
- Laser Light Properties: Protecting the Mummified Troll!
- Life Science
- Mission to Mars
- Rockets
- Sound
- Space
- Surgical Device Engineering
- Weather and Atmosphere

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> Home > Curriculum > Activities > Energy Detectives at Work

Activities may be standalone, or part of lessons or curricular units.

TE Activity: Energy Detectives at Work

Summary

Students search for clues of energy around them. They use what they find to create their own definition of energy. They also relate their energy clues to the engineering products they encounter every day.

Engineering Connection

Energy is all around us. Engineers study the different forms of energy to help create things that make our lives easier, such as appliances and assistive technologies. Energy is also considered when designing auditoriums, buildings, bridges and space flight. To use energy, engineers need to understand the characteristics of energy, where it comes from and how it can be transformed and transferred. Engineers need to be able to locate energy and its sources visually and quantitatively. Building systems engineers who install or maintain lighting or heating and ventilation systems in building examine the building for its sources of energy.

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Contents

1. Learning Objectives
2. Materials
3. Introduction/Motivation
4. Vocabulary
5. Procedure
6. Attachments
7. Troubleshooting Tips
8. Assessment

TeachEngineering.org Activity - Energy Detectives at Work - Windows Internet Explorer

http://teachengineering.org/view_activity.php?url=http://www.teachengineering.org/collection/cub_/activities/cub_energy2/

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TeachEngineering.org Activity - Energy Detectives at ...

Page

Grade Level: 4 (3-5)
Group Size: 2
Time Required: 45 minutes
Activity Dependency :None

Expendable Cost Per Group : US$ 0
Keywords: energy, energy engineer, energy sources, types of energy, what is energy
Reviews: Read Reviews | Be the First to Write a Review

Related Curriculum :

subject areas: Physical Science; Science and Technology
curricular units: Energy
lessons: What is Energy?

Educational Standards :

Colorado Science

Does this curriculum meet my state's standards? Massachusetts Submit

Learning Objectives (Return to Contents)

After this activity, students should be able to:

- Have an idea about the definition of energy.
- Determine what energy is, where it comes from and how it can be used.

Materials List (Return to Contents)

Each group needs:

- Energy Detective Worksheet
- Pen or pencil for writing

Introduction/Motivation (Return to Contents)

Energy is something we use every day. We do not always think about it, but we are using energy even when we walk or sit up straight. Energy is being used when we open the refrigerator or turn on a radio, and energy is around us when we listen to a song or watch a television. There are so many types and sources of energy that sometimes energy is hard to define.

We know that energy may be seen in the form of light when we turn on a light bulb. It also may be felt

Engineer Your Life - Homepage - Windows Internet Explorer

http://www.engineeryourlife.org/

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Engineer Your Life™

A guide to engineering for high school girls

Dream big. Love what you do.

- Why Engineering?
- Meet Inspiring Women
- Find Your Dream Job
- Making It Happen

- For Counselors & Parents
- For Engineers
- For Middle School Girls (see engineergirl.org)

Welcome to Engineer Your Life, a guide to engineering careers for high school girls! Imagine what life would be like

What Girls Think About Engineering
What Girls Want From Their Careers
Compelling Engineering Messages
Ways We Can Inspire
Get Involved

Compelling Engineering Messages

Once the coalition identified what girls wanted, it enlisted the market research firms BBMG and Global Strategy Group to develop and test various career messages that would motivate girls to consider engineering. This effort was undertaken in collaboration with a larger, ongoing campaign sponsored by the National Academy of Engineering's Public Understanding of Engineering program, which seeks to broaden Americans' knowledge of engineering and its place in our society.

Four messages tested the strongest among high school girls:

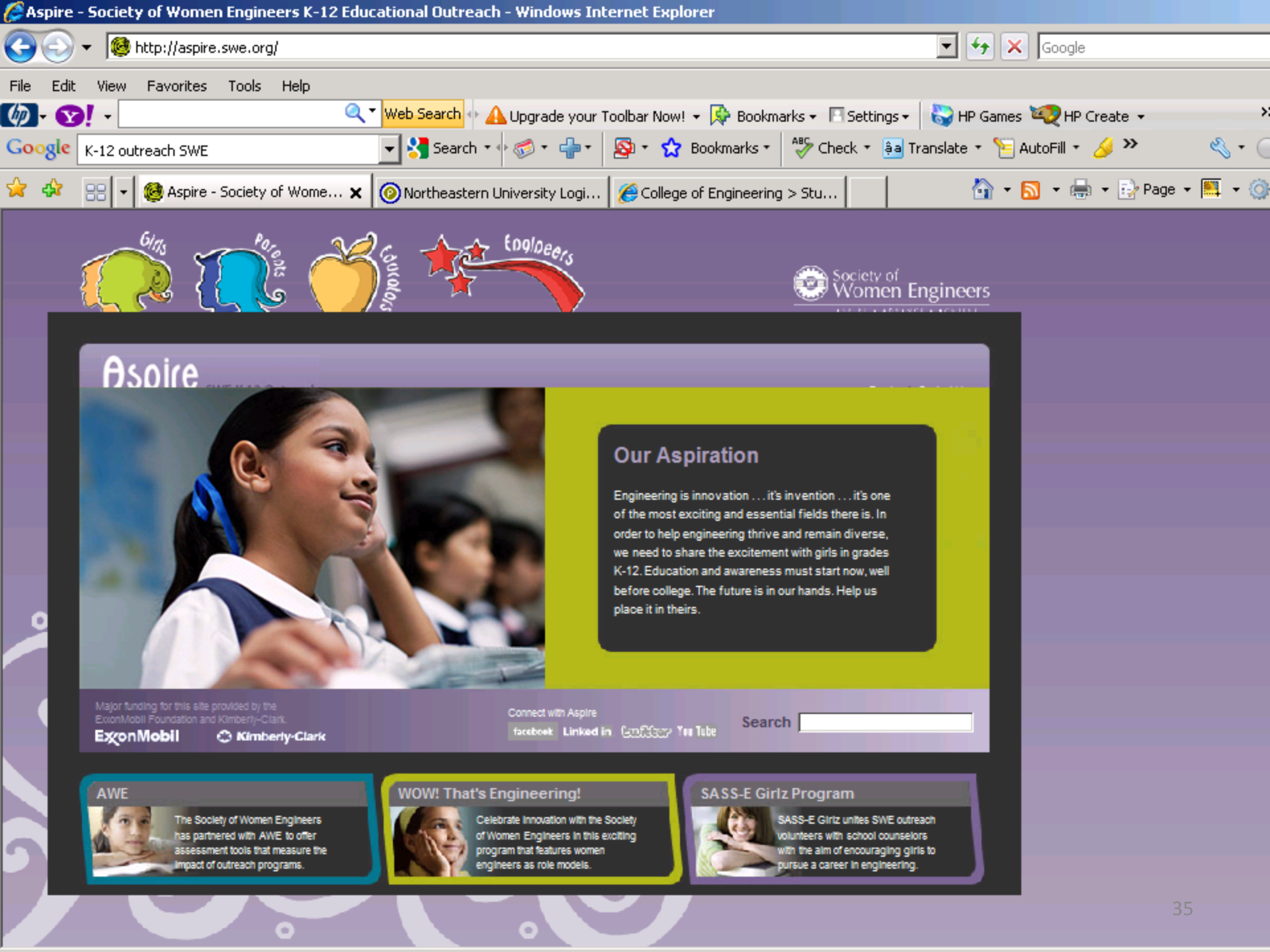
Live your life, love what you do. Engineering will challenge you to turn dreams into realities while giving you the chance to travel, work with inspiring people and give back to your community.

Creativity has its rewards. Women engineers are respected, recognized and financially rewarded for their innovative thinking and creative solutions.

Make a world of difference. From small villages to big cities, organic farms to mountaintops, deep-sea labs to outer space, women engineers are going where there is the greatest need and making a lasting contribution.

Explore possibilities. Women engineers often use their skills to go into business, medicine, law, or government. An engineering education will prepare you for many different careers.

In light of engineering's persistent public image problem, these tested messages—which are aligned with the values and aspirations most important to girls—can help us convince them that engineering is exciting, meaningful, and definitely worth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Our Aspiration
Engineering is innovation . . . it's invention . . . it's one of the most exciting and essential fields there is. In order to help engineering thrive and remain diverse, we need to share the excitement with girls in grades K-12. Education and awareness must start now, well before college. The future is in our hands. Help us place it in theirs.
Major funding for this site provided by the ExxonMobil Foundation and Kimberly-Clark
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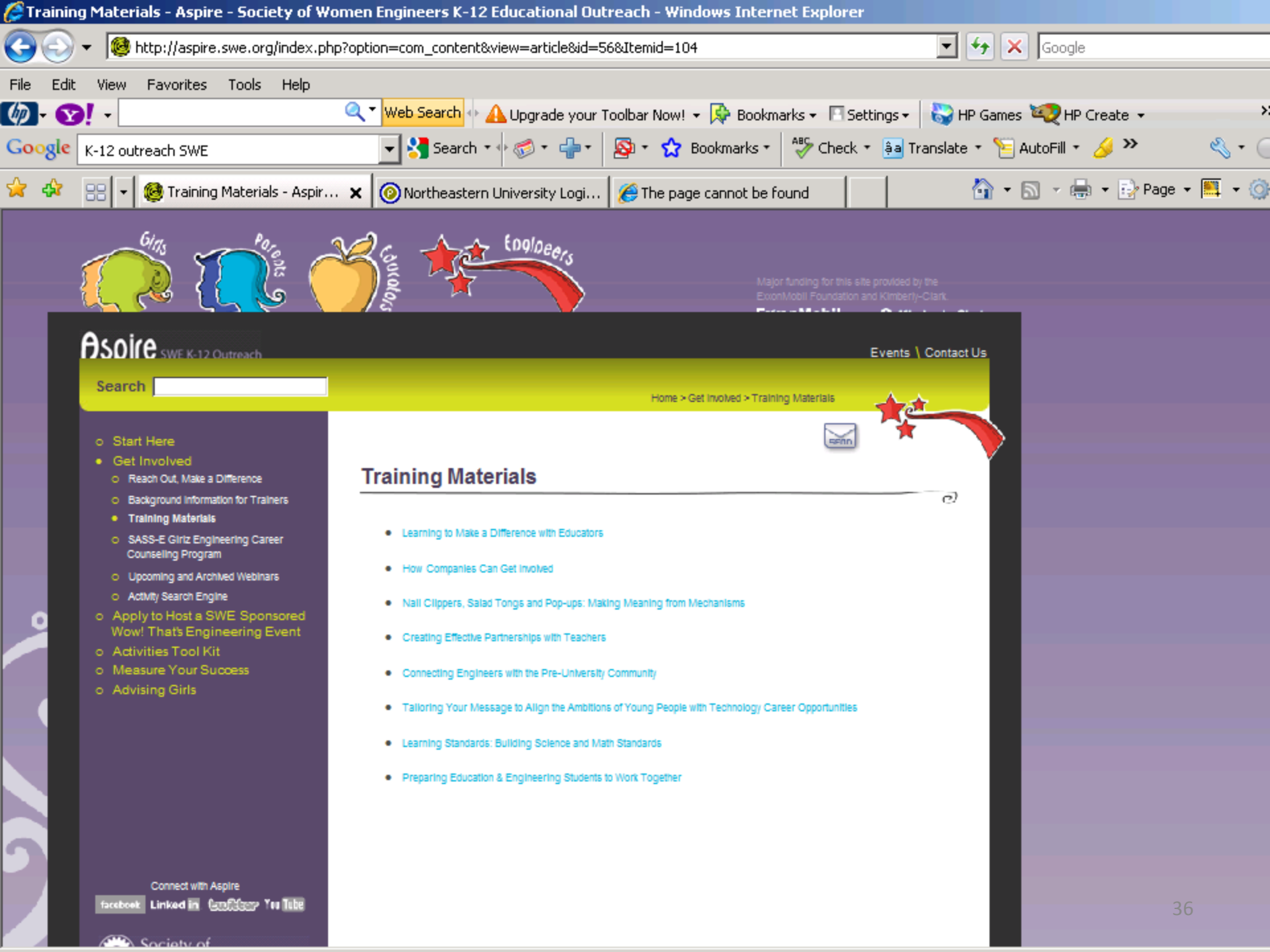
AWE
The Society of Women Engineers has partnered with AWE to offer assessment tools that measure the impact of outreach programs.
WOW! That's Engineering!
Celebrate Innovation with the Society of Women Engineers in this exciting program that features women engineers as role models.
SASS-E Girlz Program
SASS-E Girlz unites SWE outreach volunteers with school counselors with the aim of encouraging girls to pursue a career in engineering.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Activities Tool Kit
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Advising Girls
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How Companies Can Get Involved
Nail Clippers, Salad Tongs and Pop-ups: Making Meaning from Mechanisms
Creating Effective Partnerships with Teachers
Connecting Engineers with the Pre-University Community
Tailoring Your Message to Align the Ambitions of Young People with Technology Career Opportunities
Learning Standards: Building Science and Math Standards
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Welcome

Reach. Respect. Recognize.

Welcome to the National Engineers Week Foundation Online. The Foundation and our coalition strive to be the global leader in cultivating and celebrating the engineering profession.

Our cornerstone program is Engineers Week. All programs are designed to reach out to current and future generations of engineering talent. We respect the value each coalition partner brings while recognizing that to prepare for the future we must work together because none of us is as strong as all of us.

National ENGINEERS WEEK Foundation

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Million HOURS OF STEM OUTREACH

Announcements

2010 Engineers Week
February 14-20

Events

Million Hours Campaign

Engineer Your Life

Resources for Getting Involved

National Programs and Other Cool Sites….

http://eweek.org

Engineers Week Programs: presentations, etc.

Future Cities Competition: 100s of participants across the country – listings near you, and how to start a new team

http://www.greatachievements.org/

http://acs.org/

http://discoverengineering.org/

And coming soon….. k-12.aiche.org !!

AIChE


Discover Engineering - Windows Internet Explorer
http://www.discoverengineering.org/
Google
File Edit View Favorites Tools Help
Web Search
Upgrade your Toolbar Now!
Bookmarks
Settings
HP Games
HP Create
Search
Check
Translate
AutoFill
Discover Engineering
Page
Discover ENGINEERING
Sponsors
WARNING:
Clicking on this screen might change your life.
WANT TO SAVE THE Planet?
WANT TO HELP Others?
WANT TO DESIGN WITH Computers?
What's Engineering
Video Activities
Did You Know?
What's New In Engineering
Cool Stuff
2008 National Engineers Week Foundation. All rights reserved.
FLUOR
Rockwell Collins
bp
intel
ConocoPhillips

What an AIChE K-12 Website is going to Offer?

Reduce the Energy Barrier for ChEs to get involved

- Target interests of Chemical Engineers
- Enable Connections
- Ready-to-use-or-modify *tested* presentations, activities, programs
- Provide PR for YOUR activities

K-12 Web Initiative

Mission: Increase interest, awareness , and excitement for science and engineering, and chemical engineering in particular, in K-12 students ***by utilizing web-based tools to enable local volunteers to focus on exciting students in K-12 about engineering and science by disseminating national best practices and making local connections between the ultimate customers (students and teachers) and the resources (volunteers, information, companies, and resources), while increasing awareness of AIChE activities to the general public.***

Centralize, Connect, Coordinate, and Communicate: Leveraging The National Volunteer Base and Ideas for Enhanced and Expanded Local Impact in K-12 Outreach.

K-12 Web.. What will it be?

- **Searchable and interactive database housed on AIChE server**
  - Collection of screened and formatted best practices from around the country
  - Search based on audience level, topic, length, expense
  - Search for "how to's" [contact school, start own program, talk with middle school children, etc…]
  - ***Provide real person contact…..***
- **Way to make connections**
  - for volunteers to find activities/programs in their local area
  - way for teachers to find activities or local volunteers
  - way for new volunteers to find a way to contribute in their local area
  - ***Way to make appointments and submit questions….***

NOTE: dark purple and italics means goal for second round…..

AIChE

K-12 Web.. What will it be? (continued)

- ***Way for AIChE to develop new outreach opportunities enabled by web technology***
  - **Globalization**
  - **Networking with mentors and other students**
  - **webinars**
  - **Interactive web activities**
  - **????**

NOTE: dark purple and italics means goal for second round…..

k-12.aiche.org Timeline

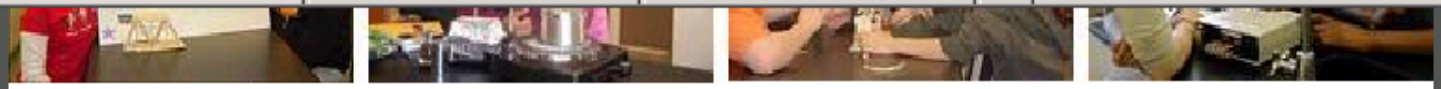
Now: Under construction

[Still time to get your program or activity in!! Send to kziemer@coe.neu.edu]

National Meeting in November:

Available for testing and feedback as part of K-12 outreach networking event from 11:00 to 2:00 on Monday, Nov. 9

January: Public rollout of Phase 1



Fun Science Facts
The only letter not appearing on the Periodic Table is the letter J.

Search for Module

Audience Level: Any

Desired topics:
or browse by **category**

Module type: ☐ Presentation ☐ In-class Activity ☐ Program

Length of Module: Any

Approximate Cost: Any

Math Difficulty:
Within selected audience level ○ Easy ○ Medium ○ Advanced

Science Difficulty:
Within selected audience level ○ Easy ○ Medium ○ Advanced

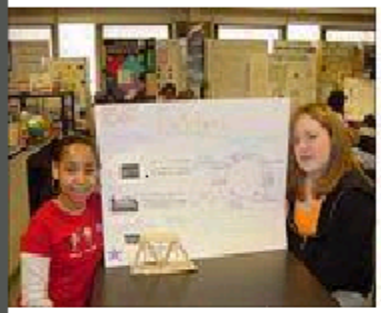
Who is presenting: ○ Group ○ Individual ○ Either

Recommended presenter : ☐ Professional ☐ College Student ☐ Parent ☐ Teacher

Standards covered:

Search Module

AIChE K-12 Web Initiative




Home
Module Search
Connections
Resources
Students
About Us
Upload Module
(Admin user only!)

Fun Science Facts
Hydrogen is the first element on the periodic table. It has an atomic number of 1. It is highly flammable and is the most common element found in our

Search for activity, program or presentation by topic and audience level or browse by category

Audience Level: Any

Desired topics:
or browse by category

Category:
Hide category
Engineering
Earth Science
Energy
Chemistry

Module type:
(Select all that apply)
☐ Presentation ☐ In-class Activity ☐ Program

Length of Module: Any

Approximate Cost: Any

Math Difficulty:
Within selected audience level
○ Easy ○ Medium ○ Advanced

Science Difficulty:

AIChE K-12 Web Initiative

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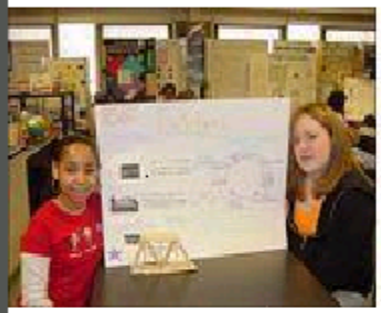



- Home
- Module Search
- Connections
- Resources
- Students
- About Us
- Upload Module (Admin user only!)

Fun Science Facts
The amount of carbon in the human body is enough to fill about 9,000 'lead' pencils.

Search for activity, program or presentation by topic and audience level or browse by category

Audience Level: Any

Desired topics:
or browse by **category**

Category:
Hide category
Motion
Gases
Electricity
Biology

Module type:
(Select all that apply)
☐ Presentation ☐ In-class Activity ☐ Program

Length of Module: Any

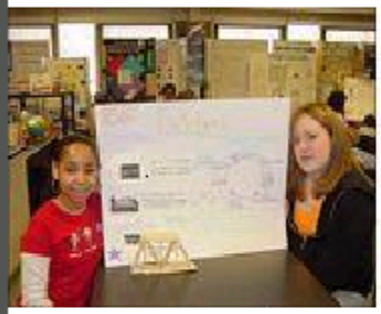
Approximate Cost: Any

Math Difficulty:
Within selected audience level
○ Easy ○ Medium ○ Advanced

Science Difficulty:

AIChE K-12 Web Initiative

Home · Connections · Module Search · About Us




Links

- Home
- Module Search
- Connections
- Resources
- Students
- About Us
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Fun Science Facts
Liquid air looks like water with a bluish tint.

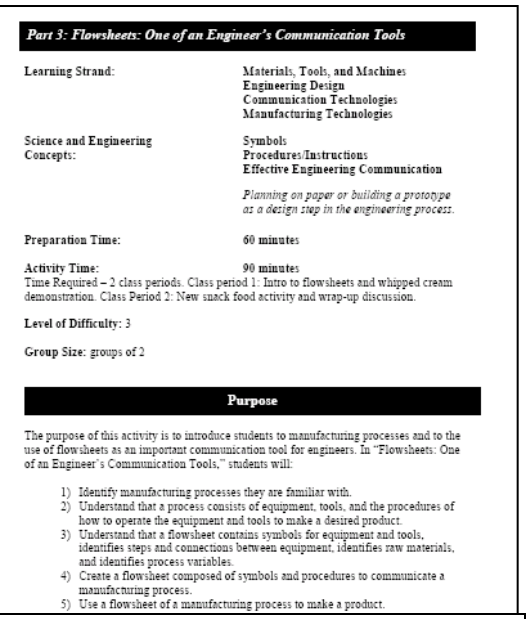
Search Results

Results 1 - 2 of 2

Artificial Pancreas.pdf Summary Quick Reference
Keywords: biology, engineering, human body, waste
Category: Engineering , Chemistry , Biology **Standards covered:** Unknown
Practice Type: In-Class **Length of module** 60 minutes **Cost:** < $20
Audience Level: 4-6 **Math Difficulty Level:** Easy **Science Difficulty Level:** Medium
Presenter: Group or Individual **Presenter Characteristics:** Professional ,College Student ,Parent ,Teacher

Biopolymer.pdf Summary Quick Reference
Keywords: biology, polymer, chemistry, reactions, kinetics,
Category: Engineering , Chemistry , Biology **Standards covered:** Unknown
Practice Type: In-Class **Length of module** 30 minutes **Cost:** < $50
Audience Level: 4-6 **Math Difficulty Level:** Easy **Science Difficulty Level:** Easy
Presenter: Group or Individual **Presenter Characteristics:** Professional ,College Student ,Parent ,Teacher

What is a "formatted" module?



Part 3: Flowsheets: One of an Engineer's Communication Tools

Learning Strand: Materials, Tools, and Machines; Engineering Design; Communication Technologies; Manufacturing Technologies

Science and Engineering Concepts: Symbols; Procedures/Instructions; Effective Engineering Communication

Planning on paper or building a prototype as a design step in the engineering process.

Preparation Time: 60 minutes

Activity Time: 90 minutes

Time Required – 2 class periods. Class period 1: Intro to flowsheets and whipped cream demonstration. Class Period 2: New snack food activity and wrap-up discussion.

Level of Difficulty: 3

Group Size: groups of 2

Purpose

The purpose of this activity is to introduce students to manufacturing processes and to the use of flowsheets as an important communication tool for engineers. In "Flowsheets: One of an Engineer's Communication Tools," students will:

1) Identify manufacturing processes they are familiar with.
2) Understand that a process consists of equipment, tools, and the procedures of how to operate the equipment and tools to make a desired product.
3) Understand that a flowsheet contains symbols for equipment and tools, identifies steps and connections between equipment, identifies raw materials, and identifies process variables.
4) Create a flowsheet composed of symbols and procedures to communicate a manufacturing process.
5) Use a flowsheet of a manufacturing process to make a product.

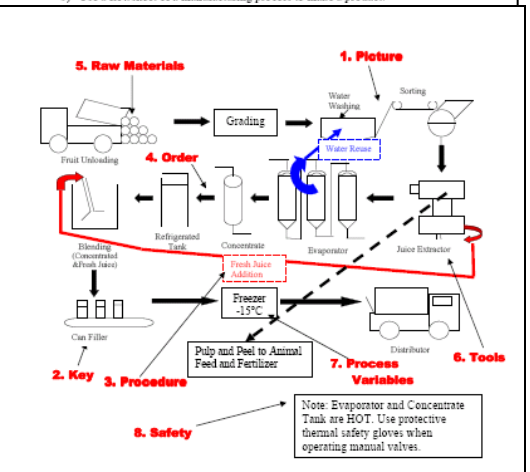
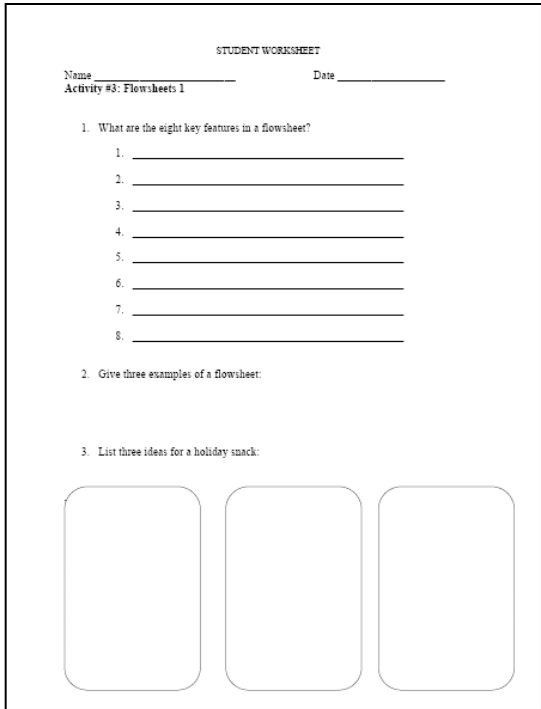


Figure 2: More Complex Flowsheet for Producing Concentrated Orange Juice

This sketch is based on the flowsheet of Richard F. Matthews, Frozen Concentrated Orange Juice from Florida Oranges, Fact Sheet FS 8, a series of the Food Science and Human Nutrition, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Publication date: April 1994. See the following website for more information: www.ultimatecitrus.com/pdf/fcoj.pdf.

Contains all needed information to run an activity

- Level(s) of intended audience
- Materials
- Time required
- Purpose – learning objectives – standards
- Background information
- Planning instructions
- Presentation materials
- Student worksheets
- Quick instructors guide
- Assessment tools
- *Contact person*



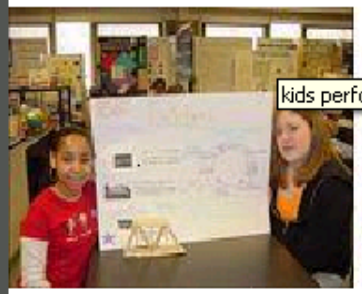
STUDENT WORKSHEET

Name _____ Date _____

Activity #3: Flowsheets 1

1. What are the eight key features in a flowsheet?
   1. _____
   2. _____
   3. _____
   4. _____
   5. _____
   6. _____
   7. _____
   8. _____
2. Give three examples of a flowsheet:
3. List three ideas for a holiday snack:

AIChE K-12 Web Initiative





Home
Module Search
Connections
Resources
Students
About Us
Upload Module
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Fun Science Facts
An ounce of gold can be stretched into a wire 80 kms (50 miles) long.

Search Results

Results 1 - 1 of 1

liquid crystal.pdf

Keywords: nanotechnology, nanoscience, chemistry, physics
Category: Engineering **Standards covered:** Unknown
Practice Type: In-Class ,Program **Length of module** 30 minutes **Cost:** < $20
Audience Level: General **Math Difficulty Level:** Easy **Science Difficulty Level:** Easy
Presenter: Either **Presenter Characteristics:** Professional ,College Student ,Parent ,Teacher

How do “Connections” work?

Lists of contacts for outreach by state, region, city

List of expert contacts by subject area/topic

Chat Rooms

Open forms for posting volunteer opportunities and volunteer needs

AIChE

How Do I know my outreach is "good"?

Use material from trusted sites that you are comfortable with

Communicate with successfully active organizations in AIChE/other volunteers

Take advantage of training/learning opportunities

Do assessment [modules, SWE, ….]

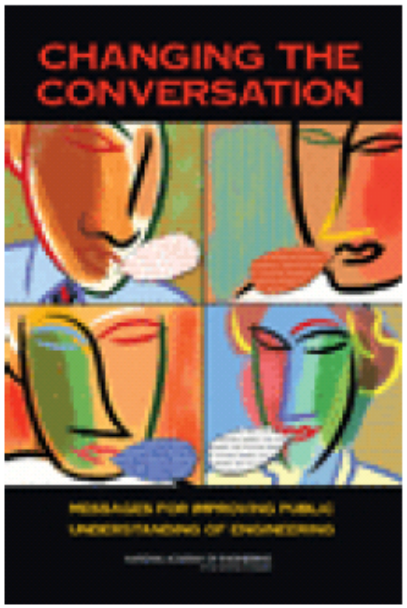
Remember the end goal:

Help students enjoy science and engineering so that they are effective learners and can contribute to and participate fully in our ever increasingly technical society

AIChE

Keeping the goal in mind…

Free Executive Summary



Changing the Conversation: Messages for Improving Public Understanding of Engineering

Committee on Public Understanding of Engineering Messages, National Academy of Engineering

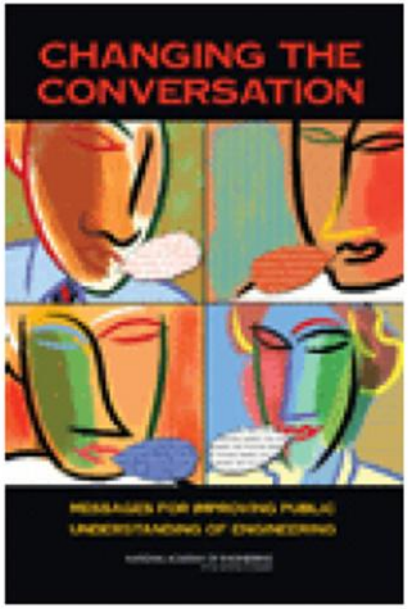
ISBN: 978-0-309-11934-4, 164 pages, 6 x 9, paperback (2008)

http://www.nap.edu/

Changing the Conversation
National Academy of Engineering

"No profession unleashes the spirit of innovation like engineering. From research to real-world applications, engineers constantly discover how to improve our lives by creating bold new solutions that connect science to life in unexpected forward-thinking ways. Few professions turn so many ideas into so many realities. Few have such a direct and positive effect on people's everyday lives. We are counting on engineers and their imaginations to help us meet the demands of the 21st century."

Keeping the goal in mind…



Engineers make a world of difference

Engineers are creative problem solvers

Engineering is essential to our health, happiness, and safety

Engineers help shape the future

Tested messages

Preliminary Taglines

Turning ideas into reality
Designed to work wonders
The power to do
Behind the next big thing

Because dreams need doing
Life takes engineering
Bolder by design

How AIChE is helping….

At the National Meeting:

- Student Chapters Workshop on energy K-12 outreach
  - 10:30 to Noon on Saturday, Nov. 7

- Education Division K-12 outreach session
  - 8:30 to 11:00 on Monday, Nov. 9

- Networking opportunity
  - 11:30 to 2:00 on Monday, Nov. 9 – see other activities, gather information, make contacts, see and provide feedback on the web site

- Changing the Conversation Workshop
  - 8:30 to 11:00 on Wednesday, Nov. 11

Come and Join in!!

How AIChE is helping….

Ongoing:

Increase effective connections through SIOC
Irvin W. Osborne-Lee

k-12.aiche.org

- Education
- Building network of K-12 volunteers
- building central location for resources and contacts
- making connections among members

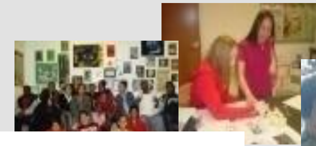
We need YOUR help, too!!

Come to the network event at the National meeting and give us feedback!

Ideas? Modules? Programs? Contact: kziemer@coe.neu.edu

AIChE

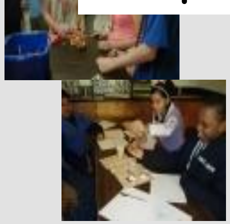


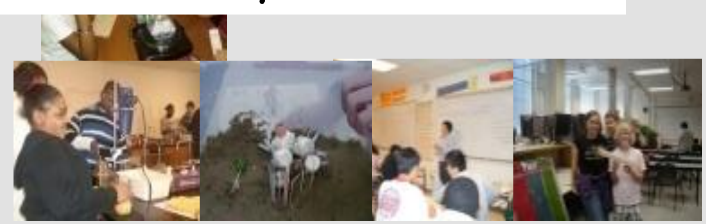




Increasing interest, awareness, and excitement for science and engineering in K-12 students.




Preparing future engineering students and professionals to creatively solve technical challenges in an ethical, environmentally responsible, and socially conscious way.





Outreach

Special Thanks…..

To all the K-12 Web Team, especially

Skip Rochefort
Alan Zagoria
John McCormick
Lou Felice

And to Lola Adefeso for discussions of her curriculum development work….

I am happy to take any questions!

Please feel free to contact: kziemer@coe.neu.edu