Sally Ride Science/NSTA Web Seminar:

Igniting Students’ Interests in Science Careers

Dr. Karen Flammer, Sally Ride Science  Julie Miller, Olathe District Schools, KS

Thursday, January 8, 2009
Overview

Discuss a model to ignite students’ interest in science careers which shows

- The wide variety of science careers
- The diverse women/men involved in science
- Ways to get students thinking about their interests, strengths and goals
Encouraging interest in science has never been more important

- In 4th grade, two thirds of boys and girls like science.
- But, by ~6th grade . . . many turn away from science girls > boys
- Why?
  - Some face lingering stereotypes
    Some aren’t encouraged
  - Many students don’t know what scientists do or who makes a good scientist.
  - Many students do not see the relevance of science, or connect it to the real world.
Encouraging interest in science has never been more important

• Science plays a greater role in our lives than ever before.

• Students who have a solid background in science are prepared for a wide variety of opportunities.

• Science improves and grows only through the contributions of diverse perspectives.
It’s suicidal to create a society that depends on science and technology…in which no one knows anything about science and technology.  

Carl Sagan
Is this statement TRUE or FALSE?

Of the 20 fastest growing professions, 17 are health- and science-related.
Everyone take a minute to draw what a scientist looks like.
What does a scientist look like?

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What does a scientist look like?

Stephanie C. 

By Nicole W.
What does a scientist look like?

By Serena M.

By Maddy B.
What does a scientist look like?
What does a scientist look like?

By Caroline S.
Let’s Pause for Two Questions from the Audience
What does a scientist look like?

Young people have an image of scientists as eccentric old men with wild hair, smoking cigars, deep in thought, alone. Basically, they think of Einstein.

We need to change that image and give our children a much richer, nuanced view of who scientists are, what scientists do, and how they work.

Jacqueline Eccles, 2005
Key Concepts –
Teaching Science Careers

• Science advances through the contributions of many different women and men from different social and ethnic backgrounds

• Some scientists work in teams, and some work alone, but all scientists communicate

• There are many different paths to becoming a scientist
Who could they be drawing?

Ellen Ochoa – Astronaut

- Wanted to be president as young girl
- Changed majors five times in college
- Eventually earned a degree in physics
- Became interested in becoming an astronaut in graduate school
- Went on to become the first Hispanic woman to go into space
**WHAT ARE YOUR STRENGTHS?**

Many skills that you use every day are important skills for many different careers. Underline your skills. Then circle the top 10 underlined skills you would most enjoy using.

<table>
<thead>
<tr>
<th>Communication</th>
<th>Teamwork</th>
<th>Investigate</th>
<th>Service to Others</th>
<th>Physical</th>
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</thead>
<tbody>
<tr>
<td>Write</td>
<td>Solve problems</td>
<td>Communicate ideas</td>
<td>Social skills</td>
<td>Build</td>
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<td>Edit</td>
<td>Time management</td>
<td>Analyze ideas</td>
<td>Listening</td>
<td>Construct</td>
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<td>Summarize</td>
<td>Make decisions</td>
<td>Analyze data</td>
<td>Working in a group</td>
<td>Invent</td>
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<td>Verbal communication</td>
<td>Meet deadlines</td>
<td>Research</td>
<td>Sensitivity to others</td>
<td>Operate equipment</td>
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<td>Listen</td>
<td>Motivate</td>
<td>Read for information</td>
<td>Empathize</td>
<td>Repair</td>
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<td>Lead discussion</td>
<td>Recruit</td>
<td>Interview for information</td>
<td>Social activism</td>
<td>Use physical coordination</td>
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<td>Teach</td>
<td>Resolve conflicts</td>
<td>Gather data</td>
<td>Use intuition</td>
<td>Participate in sports</td>
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<td>Train</td>
<td>Initiate projects</td>
<td>Evaluate</td>
<td>Coach</td>
<td>Dance</td>
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<td>Sell</td>
<td>Organize</td>
<td>Summarize information</td>
<td>Provide care</td>
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<td>Promote</td>
<td>Coordinate</td>
<td>Observe</td>
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<td>Use languages</td>
<td>Handle logistics</td>
<td>Outline</td>
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<td>Interview</td>
<td>Put theory into practice</td>
<td>Formulate hypotheses</td>
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<td>Ask questions</td>
<td>Delegate</td>
<td>Develop theory</td>
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<td>Make presentations</td>
<td>Give directions</td>
<td>Calculate/compare</td>
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<td>Debate</td>
<td>Assume responsibility</td>
<td>Collaborate with others</td>
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<td>Think on your feet</td>
<td>Determine rules</td>
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<td>Carry on conversations</td>
<td>Set priorities</td>
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<td>Entertain, perform</td>
<td>Strategize</td>
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<td>Deal with public</td>
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<tr>
<td>Public speaking</td>
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<tr>
<td>Create art</td>
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<tr>
<td>Humor</td>
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Managing Information Using the Computer

- Math skills
- Organize information
- Manage information
- Keep records
- Attend to details
- Logical ability
- Categorize
- Summarize

Planning and Design

- Anticipate problems
- Design
- Display
- Layout/format
- Design programs
- Anticipate consequences
- Brainstorm new ideas
- Think visually
- Improvise
- Compose
- Create images

NSTA WEB SEMINARS
What skills/strengths does an astronaut need?

1. 
2. 
3. 
4. 
5. 
6.
Who could they be drawing?

Neil DeGrasse Tyson – Planetarium Director

- Visited the Hayden Planetarium as a young boy and wanted to become an astrophysicist
- Eventually earned PhD in astrophysics
- Became director of Hayden planetarium
CLUES ABOUT YOU

1. What subjects fascinate you?

2. What is your dream career? You can name two or three.

3. What do you naturally do well?

4. What local, national, or world issues interest you?

5. What is the most satisfying thing you ever did?

6. If you knew you couldn’t fail, what would you most like to do?
How many of you had a “dream career”? What were they?

Ask your students back in the classroom.
Who could they be drawing?

Interests can be combined

Donald Bliss – Medical Illustrator

- Loved art as a child but planned on becoming a doctor
- Majored in biology in college
- Noticed a poster outside a professor’s door listing careers with a biology degree
- One was medical illustration!
- Don now combines his passion for art and biology as a medical illustrator
WHAT ARE YOU LIKE?

Circle 5-7 of your personal qualities.

Attitude
Positive
Doer
Straight forward
Open minded
Realistic
Imaginative
Non-judgmental
Never give up

Social Style
Humorous
Tactful
Adventurous
Enthusiastic
Cooperative
Competitive
Fair
Caring

Personal Style
Assertive
Motivated
Energetic
Independent
Responsible
Persevering
Flexible
Calm

Work Habits
Efficient
 Dependable
Resourceful
Detail oriented
Take initiative
Decisive
Risk taking
What qualities does a medical illustrator have?

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Joy Crisp – Geologist

- As a girl, Joy loved English, reading and math
- Discovered geology when she was in college
- She now enjoys collecting rocks and figure out how they formed
- Joy was chosen to be the lead scientist for NASA’s Mars Exploration Rover mission.

Who could they be drawing?

Personal interests evolve
HOW DO YOU LIKE TO WORK?

Mark the point on each line below where you see yourself. Try to resist choosing the middle and take a stand.

on a team

by yourself, or one-on-one

reading, analyzing information, mostly on a computer

brainstorming or analyzing with people

practical, concrete problems

complex, theoretical ones

short-term assignments

long-term projects

play it safe

take risks
How does a geologist like to work?

A. On a team visiting exotic places
B. Outside, analyzing real data samples
C. At a museum in a big city
D. Inside an office at a computer
E. In a lab, simulating the surface of Mars
Who could they be drawing?

Personal interests evolve

Andrew Revkin – Environmental Reporter

- Studied biology in college and wanted to be a scientist
- Went overseas for two years and joined a sailboat crew in New Zealand
- Saw so many environmental changes taking place that he wanted to share what was happening with the rest of the world
WHAT'S MOST IMPORTANT TO YOU?

Circle the 10 top values most important in your life and in a career.

**Work Environment**
- Flexibility
- Deadline pressure
- Surroundings
- Time freedom
- High earnings
- Action, fast pace
- Structure
- Relaxed pace
- Location
- Public contact

**Personal Values**
- Integrity
- Prestige
- Achievement
- Respect
- Responsibility
- Power
- Influence
- Appreciation
- Helping
- Belonging
- Equality
- Independence
- Contributing

**Work Relationships**
- Teamwork
- Trust
- Cultural identity
- Caring
- Competition
- Cooperation
- Humor
- Harmony
- Independence
- Open communication

**Work Content**
- Challenge
- Leading
- Competence
- Risk
- Leading edge
- Detail oriented
- Social activism
- Learning
- Excellence
- Creativity
- Variety
- Growth
- Knowledge
- Adventure
What current topics does an environmental reporter cover?

Type your response on the chat window
How do we get students from

By Nicole Y.
WHAT DO YOU WANT TO BE?

Here are just a few of the science careers you could choose from.

Aerodynamicist
Aerospace Biomedical Engineer
Aerospace Engineer
Astrobiologist
Astronaut
Astronomer
Astrophysicist
Atmospheric Chemist
Aviation Safety Engineer
Behavioral Biologist
Biochemist
Botanist
Building Physicist
Chemical Engineer
Civil Engineer
Civil Systems Engineer
Climate Scientist
Communications Engineer
Computational Physicist
Computer Graphics Engineer
Design Engineer
Earthquake Seismologist
Ecologist
Electrical Engineer
Entomologist
Environmental Engineer
Environmental Mapper
Environmental Reporter
Epidemiologist
Flavor Chemist
Food Scientist
Forensic Pathologist
Forest Ecologist
Inventor
Geneticist
Geochemist
Geographer
Geologist
Geophysicist
Limnologist
Marine Biologist
Marine Geophysicist
Materials Engineer
Materials Scientist
Mechanical Engineer
Medical Illustrator
Meteorologist
Microbiologist
Mission Designer
Navigation Engineer
Neurobiologist
Neuroengineer
Nutritionist
Obstetrician
Oceanographer
Orthotist
Paleoclimatologist
Pediatric Neurosurgeon
Physical Therapist
Planetarium Director
Planetary Scientist
Plant Physiologist
Professor of Public Health
Psychologist
Robotics Engineer
Science Writer
Software Engineer
Soil Engineer
Space Historian
Space Reporter
Systems Engineer
Transportation Engineer
Veterinarian
Veterinary Geneticist
Volcanologist
Wildlife Officer

Add to the list:

1. 
2. 
3. 
4. 
5. 
6.
Let’s Pause for Two Questions from the Audience
IGNITING INTEREST IN SCIENCE

UNDERSTAND THE WIDE VARIETY OF SCIENCE CAREERS

AQUAINT YOURSELF WITH SCIENTISTS

MAP OUT YOUR FUTURE

KNOW YOURSELF
• all kinds of careers
• all levels of education (2-year to Ph.D.)
• combine interests (art and biology)
• all kinds of careers
• all levels of education (2-year to Ph.D.)
• combine interests (art and biology)

• all walks of life
• many paths
• interesting, vibrant, normal people
- all kinds of careers
- all levels of education (2-year to Ph.D.)
- combine interests (art and biology)

- all walks of life
- many paths
- interesting, vibrant, normal people

- interests
- strengths
- values
- dreams

IGNITING INTEREST IN SCIENCE

UNDERSTAND THE WIDE VARIETY OF SCIENCE CAREERS

MAP OUT YOUR FUTURE

KNOW YOURSELF

AQUAINT YOURSELF WITH SCIENTISTS
• all kinds of careers
• all levels of education (2-year to Ph.D.)
• combine interests (art and biology)

• what's your goal?
• what classes prepare you?
• what college major matches your goal?

IGNITING INTEREST IN SCIENCE

• interests
• strengths
• values
• dreams

• all walks of life
• many paths
• interesting, vibrant, normal people

KNOW YOURSELF

AQUAINT YOURSELF WITH SCIENTISTS

UNDERSTAND THE WIDE VARIETY OF SCIENCE CAREERS
Know yourself

What can educators do?

• Help students match their interests to careers

• Help students get to know themselves better
  Strengths
  Values
  Interests
  Dreams
What are you like?

- Attitude
- Personal Style
- Social Style
- Work Habits
Map out your future

What can educators do?

Guide students as they think about their goals and map out their paths

- classes
- extracurricular activities
- college majors
Map out your future

### Sally Ride Science

**MAP OUT YOUR FUTURE**

Map out your past and your future—in ANY way you’d like. Here are some ideas to get you started.

**You might want to include:**
- Hobbies
- Sports
- Math classes
- Science classes
- Personal goals
- Things you want to work on

**Ways you might want to fill in your timeline:**
- Write
- Draw
- Paste photos
- Use icons

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<th>WHEN I WAS YOUNGER:</th>
<th>MIDDLE SCHOOL:</th>
<th>HIGH SCHOOL:</th>
<th>COLLEGE &amp; GRADUATE SCHOOL:</th>
<th>MY CAREER:</th>
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**NSTA Web Seminars**
**Example: Carolyn Porco**

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<th>MY CAREER:</th>
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</thead>
<tbody>
<tr>
<td>4 kids named after the Beatles</td>
<td>Loved science; played the guitar</td>
<td>Saw Saturn through a telescope</td>
<td>Physics and Astronomy; studied Saturn’s rings</td>
<td>Space Science Institute</td>
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</table>
What about you?

Two volunteers from the Audience!
“It is important to help students--particularly girls--feel like they belong in science and help them connect to the scientific community.”

Sally Ride
Let’s Pause for Two Questions from the Audience
Sally Ride Science
http://sallyridescience.com
Thanks to our presenters, Dr. Karen Flammer and Julie Miller, and to Sally Ride Science for sponsoring this program.
http://learningcenter.nsta.org
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