"NASA/NSTA Symposium: Preparing for the Journey to Space" Friday, October 21, 2005

1:00 PM – 1:15 PM
Registration

1:15 PM – 1:35 PM
Welcome, Introductions, Goals for the Symposium

Al Byers, Assistant Executive Director of Government Partnerships and e-Learning, NSTA
Peg Steffen, NASA Explorer Schools Program Manager, NASA
Flavio Mendez, Symposia and Web Seminars Program Manager, NSTA

- About NSTA Symposia
- Agenda/Goals
- Forms/Credit Info/Logistics
- Introductions

Carla Rosenburg, Assistant Education Program Manager for Space Operations, NASA Headquarters
Dr. Art Poland, Senior Research Scientist, George Mason University
John Weis, Aerospace Education Specialist, NASA Goddard Space Flight Center
Dave McKissock, Aerospace Engineer, NASA Glenn Research Center

1:35 PM – 2:00 PM
Human Exploration of Space: An Overview and Update on the Space Shuttle and the International Space Station

Carla Rosenburg, NASA HQ

Learning Outcomes:

After participating in the presentation,

- Participants will describe how different cultures have made technology contributions to the International Space Station (ISS).
- Participants will name a risk that is part of living in the ISS and flying in the Space Shuttle, and a safety measure that helps address the risk.
- Participants will name one NASA project for student participation and will explain how to find information about the project.

2:00 PM – 2:35 PM
The Sun: Our Energy Source

Dr. Art Poland, George Mason University

Learning Outcomes:

After participating in the presentation,

- Participants will explain in simple terms how atoms give off light.
- Participants will explain why a hotter gas gives off more light than a cooler gas.
- Participants will describe how each solar layer contributes to the flow of energy from the Sun.
- Participants will explain the difference between radio waves, visible light, ultra-violet light, and x-rays.

2:35 PM – 3:30 PM

Activity 1: Differential Rotation of the Sun

John Weis, NASA GSFC and Dr. Art Poland, GMU

Learning Outcomes:

- After analyzing sunspots data, participants will determine the rotation rates of the Sun.
- Participants will utilize the knowledge provided in the session to modify and customize a lesson plan for their students.

3:30 PM – 3:40 PM

Break

3:40 PM – 4:15 PM

Space Power Systems 101

Dave McKissock, NASA GRC

Learning Outcomes:

After participating in the presentation,

- Participants will list the three types of spacecraft power systems, and for each type of power systems, they will provide one example of an application.
- Participants will list and describe the key components of the International Space Station Power System.

4:15 PM – 5:10 PM

Activity 2: Solar Collectors and You

John Weis, NASA GSFC and Dave McKissock, NASA GRC

Learning Outcomes:

- After the activity, participants will be able to construct a simple solar collector experiment and collect data from it.
- Participants will utilize knowledge from group discussion of variations on the solar collector to customize a lesson appropriate to the level of their students.

5:10 PM – 5:30 PM

Final Words

- Post-assessment form
- Evaluation form/Survey
- NSTA Web Seminars
- Raffle of door prizes

National Science Education Standards Addressed:
Content Standards, 5-8

Content Standard B:
Physical Science
As a result of their activities in grades 5-8, all students should develop an understanding of

- Transfer of Energy
  - Energy is a property of many substances and is associated with heat, light, electricity, mechanical motion, sound, nuclei, and the nature of a chemical. Energy is transferred in many ways.
  - Electrical circuits provide a means of transferring electrical energy when heat, light, sound, and chemical changes are produced.
  - The sun is a major source of energy for changes on the earth's surface. The sun loses energy by emitting light. A tiny fraction of that light reaches the earth, transferring energy from the sun to the earth. The sun's energy arrives as light with a range of wavelengths, consisting of visible light, infrared, and ultraviolet radiation.

Content Standard D:
Earth and Space Science
As a result of their activities in grades 5-8, all students should develop an understanding of

- Earth in the Solar System
  - The earth is the third planet from the sun in a system that includes the moon, the sun, eight other planets and their moons, and smaller objects, such as asteroids and comets. The sun, an average star, is the central and largest body in the solar system.
  - The sun is the major source of energy for phenomena on the earth's surface, such as growth of plants, winds, ocean currents, and the water cycle. Seasons result from variations in the amount of the sun's energy hitting the surface, due to the tilt of the earth's rotation on its axis and the length of the day.

Content Standard E:
Science and Technology
As a result of their activities in grades 5-8, all students should develop the ability to

- Design a Solution or Product
  - Students should make and compare different proposals in the light of the criteria they have selected. They must consider constraints--such as cost, time, trade-offs, and materials needed--and communicate ideas with drawings and simple models.

Content Standard F:
Science in Personal and Social Perspectives
As a result of their activities in grades 5-8, all students should develop understanding of

- Natural Hazards
  - Internal and external processes of the earth system cause natural hazards, events that change or destroy human and wildlife habitats, damage property, and harm or kill humans. Natural hazards include earthquakes, landslides, wildfires, volcanic eruptions, floods, storms, and even possible impacts of asteroids.

Content Standard G:
History and Nature of Science
As a result of their activities in grades 5-8, all students should develop understanding of

- Science as a Human Endeavor
  - Women and men of various social and ethnic backgrounds--and with diverse interests, talents, qualities, and motivations--engage in the activities of science, engineering, and related fields such as the health professions. Some scientists work in teams, and some work alone, but all communicate extensively with others.

Standards for School Mathematics Addressed:

Students should estimate, make and use measurements to describe and compare phenomena; select appropriate units and tools to measure to the degree of accuracy required in a particular situation; develop formulas and procedures for determining measures to solve problems.