Van Allen Probes
Pre-service Teacher Workshop

February 4, 2014

Space Department Education and Public Outreach

Alexandra Matiella Novak
Dawn Turney
Linda Butler
## Today’s Activities

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Materials/Activity Type</th>
<th>Activity Facilitator</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:00-12:00</td>
<td>Van Allen Probes Mission</td>
<td>Science Lecture</td>
<td>Dan Smith</td>
</tr>
<tr>
<td>12:00-12:30</td>
<td>Activity I: Sun-Earth Scales</td>
<td>WorkshopBinder/Hands-on</td>
<td>All</td>
</tr>
<tr>
<td>12:30-1:00</td>
<td>Break for Lunch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1:00-1:45</td>
<td>Activity II: Magnetic Field Lines and Exploration Stations</td>
<td>WorkshopBinder/Hands-on</td>
<td>All</td>
</tr>
<tr>
<td>1:45-2:45</td>
<td>NASA Wavelength Overview and Science Across Curriculums</td>
<td>WorkshopBinder/Presentation</td>
<td>Alexandra Matiella Novak</td>
</tr>
<tr>
<td>2:45-3:20</td>
<td>Activity III: States of Matter</td>
<td>WorkshopBinder/Hands-on</td>
<td>All</td>
</tr>
<tr>
<td>3:20-3:30</td>
<td>Evaluation</td>
<td>WorkshopBinder</td>
<td>All</td>
</tr>
<tr>
<td>3:30-3:45</td>
<td>Closing Remarks and Board Bus</td>
<td></td>
<td>All</td>
</tr>
</tbody>
</table>

Next Workshop – April 22!!!
Overview

1. Goals of Workshop

2. Binder Materials

3. Science Across Curriculum
   - STEM
   - Language Arts
   - Art, Music, Health
   - Business
   - Special Ed

3. NASA Resources for Teachers
   - NASA Wavelength (www.nasawavelength.org)
   - NASA Pre-Service Teacher Workshops and Institutes
   - Van Allen Probes Educator Resources
     (http://vanallenprobes.jhuapl.edu/education/index.php)

4. Classroom Implementation Plan
   ✓ Browse during lunch break
   ✓ Fill in during Science Across Curriculum presentation
   ✓ Finish before you leave

5. 10-minute Survey – your feedback is critical data!
Goals of Workshop

**Education Portfolio Strategic Framework**

**Higher Education**

Outcome 1: Contribute to the development of the STEM workforce in disciplines needed to achieve NASA's strategic goals, through a portfolio of investments.

**Informal Education**

Outcome 3: Build strategic partnerships and linkages between STEM formal and informal education providers that promote STEM literacy and awareness of NASA's mission.

**Elementary/Secondary Education**

Outcome 2: Attract and retain students in STEM disciplines through a progression of educational opportunities for students, teachers and faculty.

**Cultivate Diversity of Workforce Disciplines and Practitioners**

**Principles/Criteria**

<table>
<thead>
<tr>
<th>Relevance</th>
<th>NASA Content</th>
<th>Diversity</th>
<th>Evaluation</th>
<th>Continuity</th>
<th>Partnerships/Sustainability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Science, Technology, Engineering and Mathematics (STEM)</td>
</tr>
</tbody>
</table>

**NASA Education**

**Employ**

**Educate**

**Engage**

**Inspire**
A Need for Opportunities for Pre-service Teachers

- NASA recognizes that Pre-service teachers are an important community to serve
  - Many NASA Centers offer Pre-service Teacher Institutes and Workshops ranging from multi-day to multi-week experiences
  - Training for pre-service teachers is unique because it addresses both workforce development and education opportunities (Outcomes 1 and 2)
  - *Science education and literacy are at critical points and facing major issues in the U.S.*
  - *Science is for everyone!!!!!*
Resources – What You’ll Find in Your Binder

1. Agenda
2. Contact Information
3. Workshop Overview and Goals (printed out PPT)
4. Van Allen Probes Mission (printed out PPT)
5. Workshop Activities
   I. Kinesthetic Astronomy – Sun-Earth Scales (Solar Pizza)
   II. Exploring Magnetism – Magnetic Field Lines
   III. Four of the States of Matter
6. Take Home Activities
   I. Van Allen Poster
   II. Creature Feature
   III. How Cosmic Rays Affect Humans
   IV. Space Sounds
   V. Kinesthetic Astronomy
7. NASA Wavelength and Science Across Curriculum (printed out PPT)
   – NASA Wavelength Home Page
   – NASA Pre-service Institute Home Page
   – Special Ed Website Home Page
8. Classroom Implementation Plan (You Keep for Next Time)
9. Questionnaire (Give to Us)
Here we are presenting to you NASA resources interwoven into different disciplines with the Van Allen Probes as the case study

- **Science Across Curriculum**
  - STEM
  - Language Arts
  - Art, Music, Health
  - Business
  - Special Ed

- **Van Allen Probes Content**
  - Two spacecraft have been engineered to not only withstand the extremes of space weather, but to also study space weather and the Sun-Earth connection (more on this from Dr. Dan Smith);
  - Scientists and engineers must be excellent communicators to be able to overcome the challenges present with these types of missions;
  - This mission has depended on a diverse team that brings a variety of talents and perspectives to the table and understands how to maximize resources.
NASA Resources for Teachers

http://nasawavelength.org/

Landsat: Exploring our World for over 40 years!

Explore Landsat activities

View Landsat Activities
NASA Resources for Teachers Across Curriculums

http://nasawavelength.org/

- **STEM**
  - Practical use of Math and Science - PUMAS
  - Van Allen Probes Poster

- **Language Arts**
  - Van Allen Probes Poster

- **Art**
  - Creature Feature

- **Health**
  - How Cosmic Rays Affect Humans

- **Music**
  - Solar Wind Website ([http://cse.ssl.berkeley.edu/stereo_solarwind/sounds.html](http://cse.ssl.berkeley.edu/stereo_solarwind/sounds.html))

- **Business**
  - You Get What You Pay For

- **Special Ed**
  - Kinesthetic Astronomy

MORE ON THIS SLIDE THIS AFTERNOON
NASA Opportunities for Pre-service Teachers

Pre-Service Teacher Institutes

(Educators Grades K-8 & Students Higher Education)
[Available Nationally]

The Pre-Service Teacher Institute, or PSTI, was developed to provide a more in-depth experience for pre-service teachers. At the PSTI, pre-service teachers spend two weeks in an intensive experience where they are exposed to problem-based learning, mathematics, science and technology enrichment activities. Pre-service teachers are able to interface with NASA personnel and tour NASA facilities. The educators learn to incorporate NASA's cutting-edge research into lesson plans for elementary and middle school students. The institute culminates with the pre-service teachers developing and teaching problem-based lessons to children from local schools.

PSTIs are held at Ames Research Center, Johnson Space Center, Kennedy Space Center, Langley Research Center, Marshall Space Flight Center, and Stennis Research Center. Please check the web links below for current PSTI information. Contact the center directly for more information about that center's summer institute.

NASA Contact
Ms. Theresa Martinez
Project Manager
Mailcode: EX-E
Kennedy Space Center, FL 32899
Phone: 321-887-0900
E-mail: theresa.c.martinez@nasa.gov

NASA Center PTSI Web Sites
- NASA Ames Research Center's Pre-Service Teacher Institute
- NASA Johnson Space Center's Pre-Service Teacher Institute
- NASA Kennedy Space Center's Pre-Service Teacher Institute
- NASA Langley Research Center's Pre-Service Teacher Institute
- NASA Marshall Space Flight Center's Pre-Service Teacher Institute
- NASA Stennis Space Center's Pre-Service Teacher Institute
Van Allen Probes Mission Education Resources

http://vanallenprobes.jhuapl.edu/education/index.php
Will now have break – as you listen to the mission overview next, think about how the science can fit into your curriculum