



# Aerospace Education

Fall 2010

# News

Inspiring Students To Excel

*Space Shuttle Program manager, John Shannon, said, "The assembly of the space station could not have been done without the space shuttle, and the assembly of the space station is one of the great engineering achievements of mankind."*

## CAP's Eric Boe to Pilot Last Discovery Shuttle Mission

The final flight of the Space Shuttle Discovery (STS-133) is scheduled to launch on November 1, 2010. The crew of this historical last mission for the faithful Discovery will include one of CAP's own, Lt Col Eric Boe. Eric has piloted one other mission for NASA's space shuttle program, STS-126 Endeavour.

space after adding their names to posters last May as part of the annual Space Day celebration in events across the country.

Eric Boe, a former CAP cadet and currently a senior member of the Florida Wing, will be one of six crew members to take the last flight of the Space Shuttle Discovery. Read more about the mission and crew of STS-133 at [http://www.nasa.gov/mission\\_pages/shuttle/shuttlemissions/sts133/index.html](http://www.nasa.gov/mission_pages/shuttle/shuttlemissions/sts133/index.html).

### IN THIS ISSUE

<b>AEM Spotlight.....</b>	<b>2</b>
<b>AEO Spotlight .....</b>	<b>3</b>
<b>ACE Update.....</b>	<b>4</b>
<b>AE Notes.....</b>	<b>5</b>
<b>Curriculum Corner ...</b>	<b>6-9</b>
<b>AFA News.....</b>	<b>10</b>
<b>From Dep Dir Desk.....</b>	<b>11</b>
<b>Region to Region.....</b>	<b>12</b>



STS-133 crew with Robonaut (Eric Boe is the 5th astronaut going clockwise from Robonaut.)



See associated STS-133 mission lesson plans inside →

*Aerospace Education News*  
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If you have news, events, or ideas we might consider for the newsletter, please submit them electronically to [jstone@capnhq.gov](mailto:jstone@capnhq.gov).

The STS-133 launch will be the 35th mission to the International Space Station (ISS). This mission will deliver and install the Permanent Multipurpose Module and the Express Logistics Carrier 4, and provide critical space components to the ISS. Robonaut 2 will also travel to the ISS to possibly assist with EVAs and become a permanent resident on the ISS. Robonaut 2 will become the first human-shaped robot to fly into space.

Another significant mission element for this shuttle flight is to carry the signatures of students participating in the 2010 Student Signatures in Space program. The students are the latest group to have their signatures flown in

### Questions:

1. What is the significance of the STS-133 launch scheduled for November?
2. What CAP member will be the pilot for this mission?
3. What is a first for this mission?
4. What event is responsible for the Student Signatures in Space program?

(Answers on page 5)



## Aerospace Education Member (AEM) Spotlight ...

### Rachael Manzer, CT National CAP AE Teacher of the Year



Rachael Manzer (left) with CAP National Commander, Maj Gen Amy S. Courter (right) at CAP National Board Awards Banquet

Rachael Manzer has the “right stuff” to be the CAP National AE Teacher of the Year for 2010. Rachael’s students are actively engaged in their own learning as they design their own investigations, collect information, and share ideas with others. Her classroom is a learning environment that captures the essence of science and fun and where every child is successful. Rachael’s educational philosophy is that her role as a teacher is not to be the bearer of all knowledge as much as it is to facilitate learning so

***“Just imagine 240 students gathered in the gymnasium around a 21 inch television watching the first shuttle flight. It was at that moment that I became inspired and fascinated about the exploration of space.”***

***–Rachael Manzer***

students use the inquiry skills she has taught them to construct meaning for themselves.

From the beginning of her teaching career in New Hartford, Connecticut, in 1991, she became a leader in science education from local to state to national venues. Locally, Rachael volunteers her time by presenting aerospace programs at museums and local libraries. On the state level, in 2008, she was elected by her peers across the state to serve as President Elect of the Connecticut Science Teachers’ Association. Nationally, Rachael has been the kick-off presenter for NASA, the National Institute of Aerospace (NIA), and Virginia Space Grant Consortium two-week educator workshops.

One of Rachael Manzer’s many accomplishments was designing and securing funding for the Frontiers in Science: Career Exploration Program. The purpose of the program was to help minority students build an awareness of STEM (Science, Technology, Engineering, and Mathematics) careers and show pathways to help students enter the STEM career pipeline. This program immersed 150 middle school students from 21 towns in STEM career exploration. Rachael Manzer brought industry leaders right into the classroom and the students out to the industry to see careers in aerospace in action. Students visited Pratt and Whitney where jet engines are built and Hamilton Sundstrand where the space suit is built.

This year Rachael will initiate the implementation of CAP’s K-6 Aerospace Connections in Education (ACE) Program at her new STEM Magnet

School where she is the STEM coordinator.

Rachael Manzer is continuing to expand her knowledge and resources to share with her students and her peers. She goes to great lengths to present her passion to them...even to the edge of space. As one of the finalists in the Teacher in Space initiative, she has joined six other teachers from across the country as the Pathfinder 7, a group of astronaut teachers who will travel into suborbital space to conduct experiments and then bring the experience back to the classroom. Similarly, Rachael has experienced the CAP Teacher Orientation Program (TOP) Flight which takes teachers on flights in CAP aircraft to get them excited about flying and share that experience with their students.

With educators, such as Rachael Manzer, promoting aerospace to students through their own personal experiences and excitement, the next generation of scientists, engineers, and air and space pioneers are on the threshold of even more exciting discoveries and exploration. Congratulations, Rachael!



Rachael with aviation pioneer, Mary Feik, at CAP National Board.

*Photo courtesy of: Maj Stephen Rocketto, Director of Aerospace Education CT WG*



## Aerospace Education Officer (AEO) Spotlight.....

### Maj Robert H. Thomas (WI-I84 AEO) National CAP Aerospace Education Officer of the Year



Left: CAP National Commander, Maj Gen Amy Courter, presents Maj Robert Thomas with the AEO of the Year Award

Major Robert H. Thomas, Aerospace Education Officer for Walco Composite Squadron in the Wisconsin Wing, received the National Aerospace Education Officer of the Year Award in San Diego at the CAP Annual National Board and Conference for 2010. Maj Thomas enthusiastically promotes all aspects of the Aerospace Education Program in his squadron. The cadets, senior members, and education community benefit from Maj Thomas's dedication and willingness to go above and beyond to provide hands-on aviation, space and technology opportunities. From promoting the Yeager test for senior members to participation in the Aerospace Education Excellence (AEX) program for cadets, Maj Thomas devotes time and energy to a program that he has a great interest in seeing succeed.

Since 2001, Maj Thomas has set a high standard for the members of his squadron. He has not only achieved benchmarks in his own CAP professional development (attending both the National Aerospace Education Officers School and the Great Lakes Region AEO School, passing the Yeager test, and achieving the senior rating in the AE Specialty Track), but also expecting great strides forward from the other members of his squadron in aerospace education.

Maj Thomas also gives freely of his time, experience, and knowledge in the community through career presentations, aerospace education classes for organizations and schools, and Teacher

*After a Teacher Orientation Program (TOP) Flight with Maj Thomas, teacher Jeff Tracy said excitedly, as he exited the airplane, "My goal for aerospace education is to take my students higher than the plane ride I just took!"*



Above left: Maj Thomas instructs teachers during a TOP Flight  
Above right: Maj Thomas shares his enthusiasm for airplanes with a student at the Experimental Aircraft Association's AirVenture

Orientation Program (TOP) Flights for community educators who are CAP Aerospace Education Members (AEMs).

Maj Thomas's desire to pass on his experiences and knowledge dates back to childhood when he spent his allowance on airplane model kits and aviation magazines. He soloed at age 16, got his private pilot's license at age 18, flew A-7s in the Navy, and retired

from American Airlines in 2007. The professionalism and commitment that he has exhibited his entire life is being shared with the members of the Walco Composite Squadron. They are truly fortunate to have him as their Aerospace Education Officer and inspiring mentor. Congratulations to Maj Thomas and to CAP for recognizing his worth and value.



## K-6 Aerospace Connections in Education (ACE) Program

The 2010-2011 ACE Program has grown from 6,500 students to 9,500 students, with more schools registering weekly. About 350 educators across 26 states are involved in this high-interest, structured enrichment program.

What is the ACE Program? It is a grade-level specific aerospace-themed program that focuses on enriching STEM subjects to provide relevance to academics, encourage good moral character, and teach physical fitness habits for living a healthy and drug-free lifestyle. All program materials are provided free to teachers and include a national academic standards-based curriculum guide, a lesson manipulative item for each student, and special ACE t-shirts (while supplies last). Upon completion of the program, teachers receive an ACE plaque, and each student receives an ACE certificate. The ACE



Students build team spirit, as well as an interest in STEM subjects, with ACE curriculum activities.....

Program materials are additional to the materials received as an Aerospace Education Member (AEM).

If you are an elementary educator in grades K-6 and are interested in this program, please contact [ace@capnhq.gov](mailto:ace@capnhq.gov). Learn more about this exciting program and keep up with current ACE announcements by clicking the "ACE" link at [www.capmembers.com/ae](http://www.capmembers.com/ae).



ACE Mascot "Cappy" talks with ACE students

### Aerospace Education Workshops 2010

Read about three of the many examples of exciting AE professional development opportunities supported by CAP this year. Check out the AE Announcement page at [www.capmembers.com/ae](http://www.capmembers.com/ae) during the year to find out about upcoming opportunities. Let the editor know of anything YOU have going on to include in our Region to Region section of this publication.

• **The Tennessee Aerospace Education Workshop** at the University of Tennessee in Knoxville, Tennessee from July 5-23 awarded three hours of graduate credit to each teacher who participated. Not only did the teachers earn professional development credit, but they also enjoyed an orientation flight aboard a KC-135 tanker, observing the refueling of twelve F-22 fighters over northern Florida at an altitude of 35,000 feet. The teachers described this flight as a "once in a lifetime experience." The director of this course is

SER Deputy Chief of Staff for Aerospace Education, Lt Col Dave Garner.

• **The Space Exploraton Educators Conference (SEEC)** at the Johnson Space Center in Houston, Texas was a great success in February 2010. CAP taught several sessions and the Texas Wing flew AEMs in Teacher Orientation Program (TOP) Flights. The same experiences will be offered at the February 3-5, 2011 SEEC event. For information, go to <http://www.spacecenter.org/TeachersSEEC.html>.

• **Sun 'n Fun** in Lakeland, Florida is the place to be if you love airplanes and hands-on activities. Sun 'n Fun is one of the one of the world's greatest aviation fly-ins. CAP is involved in many aspects of this event including AE participation in the special Aerospace Educator's Workshop that is held one day during the fly-in. Be sure to look for information on the 2011 Sun 'n Fun event scheduled for March 29-April 3 at <http://www.sun-n-fun.org/FlyIn.aspx>.



Top: 2010 Tennessee AE Workshop participants visiting the US Space & Rocket Center  
Center: Teacher activities at SEEC 2010  
Bottom: Workshop fun at Sun 'n Fun



## Aerospace Education Notes.....

### TOP Flights Continue to Inspire Educators

CAP Teacher Orientation Program (TOP) Flights have had tremendous success in many wings that have participated. Teachers who take the flights are excited, rejuvenated, and motivated about teaching STEM subjects. The pilots who fly the teachers are equally excited to share the wonder of flight with the teachers.

This year sixteen CAP wings have flown over 200 teachers in TOP Flights. Several states are implementing the program this fall. Two current examples of successful programs are Idaho Wing and Florida Wing. The excitement that the volunteers in these wings are sharing with teachers is inspiring.



Idaho Superintendent of Public Instruction, Tom Luna; teacher, Kimmie Arrasmith and pilot, Lt Col Ralph Getchel (left to right)



Teachers from Kenwood Elementary in Florida receive a pre-flight briefing before their TOP Flight

*"Kenwood teaches the parts of the plane and their functions. Now I get to give first-hand experience. It was great!"*  
--- from a Kenwood teacher's evaluation of TOP Flight

**Note to all AEMs:** If you are a current Aerospace Education Member and have not taken a Teacher Orientation Program Flight, please let Judy Stone ([jstone@capnhq.gov](mailto:jstone@capnhq.gov)) know of your interest and she will put you in touch with the person in your state who can make the flight happen. If you have renewed your membership for the year and want to take a flight in the new fiscal year (Oct. 1 - Sept. 30), contact Judy for information. You are eligible to fly once a year as long as you remain an AEM or a teacher who is a regular senior member of CAP.



### Aerospace Education Excellence (AEX) Award Program Starts New Year!

It's time to sign up for the 2010-2011 AEX program. Each year the program begins October 1 and ends the following September 30.

What is AEX? AEX is a fun and popular hands-on activity program free to our members. Since the AEX application and program completion reports are online, many units and schools easily take advantage of this program. To sign up for this year, go to e-services at <https://www.capnhq.gov>, enter your password, and click on AEX on the right side of the page. When you complete the

program, simply go back into e-services and fill out the completion form. The unit or classroom receives a plaque and each cadet or student receives a certificate upon completing the program.

If additional information is needed about the AEX program, please go to <http://www.capmembers.com/ae>. If you have further questions, contact Debbie Dahl at [ddahl@capnhq.gov](mailto:ddahl@capnhq.gov).



#### Answers to front page story questions:

1. The STS-133 launch will be the last one for the orbiter Discovery.
2. Eric Boe will be the CAP senior member that will be the pilot on the STS-133 mission to the ISS.
3. Robonaut 2 will become the first human-shaped robot to fly into space.
4. Annual Space Day celebrations across the country are responsible for the 2010 Student Signatures in Space program.



STS-133



## CURRICULUM CORNER....GRADES K-4

# ROBOTS-HELPERS FOR ASTRONAUTS

**Objective:** Students will learn what a robot is and how robots help astronauts. They will also simulate how difficult it is for a robot to do human tasks.

**National Science Standards:**

Content Standard A: Science as Inquiry

- Understanding about scientific inquiry

Content Standard E: Science and Technology

- Abilities of technological design

Content Standard G: History and Nature of Science

- Science as a human endeavor
- Unifying Concepts and Processes
- Form and function

**Grade Level(s):** K-5

**Teacher Background Information:**



STS 133 crew with Robonaut 2

The STS-133 mission of the Space Shuttle Orbiter Discovery will have a first event for spaceflight; the astronauts will be joined by a robot with human-like

form. Robonaut 2 (R2) will be transported to the International Space Station aboard Discovery to help astronauts with future tasks on the ISS. Robonaut 2 looks like the upper body of a person. It has a chest, head, and arms. Robonaut 2 has the ability to use space tools similar to a human astronaut. Robonaut 2 is expected to help astronauts on the ISS do the routine, repetitive jobs that have to be done to keep the ISS in working order. The plans to get R2 to the space station and operational have involved many engineering challenges. The stresses if launch on

the sensitive parts of R2 have to be taken into consideration, as well as the microgravity conditions in which R2 will perform in when it reaches the ISS pose many challenges. The future of robotic interaction with the space environment (as well as with and without human partners) is where R2 becomes the first of its kind to "go where no human-like robot has gone before."

**Student Information (taken from a NASA electronic storybook for young children on robots found at <http://www.nasa.gov/audience/forstudents/k-4/stories/ames-robots-storybook.html>):**

Robots are machines. They can do some things that people can do, and they can do some things that people can't. Robots don't have to eat. They don't have to drink. And they don't get lonely.

Robots can do the same things over and over exactly the same way. They don't get bored. They don't get tired. And best of all, robots can do things that are too dangerous for us to do.

That is why NASA uses robots. They send robots on long trips. They send them to places where there is no air to breathe. They send them where people can't go, or can't go yet.

The list below will tell you about a few NASA robots. Some are still being tested. Some are being used right now!

- **Robonaut** looks a lot like a human. It has a head, arms, and upper body. Robonaut will go outside the International Space Station. It may work with astronauts on spacewalks. It may even go where it's not safe for humans.

- The space shuttle has a robot arm. It helps move things into and out of the shuttle. It can also hold an



astronaut who is working in space.

- Mars rovers are robots. They drive around on the land. Three NASA rovers are on Mars. Two of them are still working!

- Stardust was the first robot sent to a comet. It brought bits of the comet back to Earth in January 2006.

In the past, robots have helped with NASA's exploration initiatives. In the future, we will use robots to help in preparation and deployment of humankind's return to the moon, and to Mars and beyond.

**Materials:**

- Pictures from the NASA electronic storybook to share either on a computer or by putting together a physical display
- Objects to use for robot assistant simulation such as: unsharpened pencils; hand-held pencil sharpener; safety scissors; coat or jacket with buttons; piggy bank (non-breakable kind); pennies
- 4-8 pair of heavy gloves, such as workman's gloves or snow gloves (if you can get children-sized gloves, the activity will be more successful)
- Robot picture to color and cut out (the picture provided on the next page may be enlarged if desired)
- Crayons

**Preparation before activity:**

1. Prepare pictures of robots from the NASA electronic storybook in a display, copied individually for each student, or viewed in the computer lab electronically for background on robots.



2. Prepare materials for robot assistants to accomplish such as: putting pennies in piggybank, sharpening pencils, buttoning a coat or jacket, cutting out a robot picture, or anything you think will demonstrate the difficulty a robot has when trying to manipulate human tools.

3. Copy the robot picture for students to color at the end of the activity. Cut out and add children's names for a classroom display.

**Procedure:**

1. Ask students what they think a robot is and what a robot can do. Post their responses on sentence strips or on a chart tablet to discuss when they are finished with the activity.

2. Talk with students about NASA's robots, and, particularly, Robonaut 2.

3. Show them pictures of robots that you have prepared in preparation for this activity.

4. Tell students that they will be simulating (or pretending) to do a task that a robot assistant might do.

5. Have students try to do the task without the gloves and then with the gloves.

6. Ask students what the gloves represent in this activity. (Answer: The gloves represent the difficulty most robots have with fine motor skills, such as buttoning, cutting, and using tools (like the pencil sharpener) due to their limited finger

and hand movement.)

7. Remind students that robots are being improved every day, but most of the time robots have a lot of trouble doing the tasks that most humans find easy.

**Extension:**

- Ask students what they think would be the difficulty (from the human's point of view) of a person doing the job of a robot. (Such things as the task being dangerous, too repetitive, or bringing on fatigue and boredom, are possible answers.)

- Have students share their pictures of robots that they colored and tell the class one thing they learned about a robot from this activity.

## Directions and student sheet for "Robots - Helpers for Astronauts"

Name: \_\_\_\_\_

1. See how fast you can do the task your teacher shows you.

2. Now put on the gloves your teacher gives you and try to do the same task again.

3. What was the difference between doing the task without gloves and with gloves?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

4. Do you think a robot could do this task easily? \_\_\_\_\_  
Why or why not?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

5. Discuss your answers with your teacher and your class.

My Robot \_\_\_\_\_

By: \_\_\_\_\_

**NAME AND COLOR THE ROBOT. CUT OUT THE FINISHED PICTURE AND GIVE IT TO YOUR TEACHER TO SHARE WITH THE CLASS. DISCUSS WHAT YOUR ROBOT CAN DO.**



## CURRICULUM CORNER (GRADES 5- 12)

### "Ship the Chip"

(Developed by the Institute of Electrical and Electronics Engineers (IEEE) as part of TryEngineering at [www.tryengineering.org](http://www.tryengineering.org))

**Objective:** Students will learn the importance of providing the correct packaging material to protect their "chiponaut" during transport. Students will be able to apply this activity to the coming STS 133 mission and the preparation of Robonaut 2 for transport.

**National Science Standards:**

Content Standard A: Science as Inquiry

- Abilities necessary to do scientific inquiry
- Understandings about scientific inquiry

Content Standard E: Science and Technology

- Abilities of technological design
- Understandings about science and technology

Content Standard F: Science in Personal and Social Perspectives

- Science and technology in local, national, and global challenges

Content Standard G: History and Nature of Science

- Science as a human endeavor

**Grade Level(s): 5-12**

**Background Information:**

Eric Boe and the crew of the STS-133 will not only take the Permanent Multipurpose Module (PMM), the Express Logistics Carrier 4, and critical spare components to the International Space Station, but will also have a VIR (Very Important Robot) onboard. Robonaut 2 (R2) will be the first human-like robot to go into space. R2 will not occupy a seat alongside the astronauts. Instead, R2 will be gently packed in a carefully-constructed box inside the PMM. Many modifications had to be engineered for this sensitive piece of equipment to travel to the ISS. Such considerations as launch vibrations, lack of repair parts for R2, noise requirement level for the ISS, and harmful electromagnetic waves, were addressed by the engineers and other scientists. Trying to come up with pack-

aging that would not only protect R2 and its delicate systems, but would also work in the time, space, and weight requirements for the mission, was a daunting task. NASA and its engineering partners tackled this problem with ingenuity and the ability to overcome seemingly insurmountable odds and time tables to come up with a protective box that would reduce the launch-induced vibrations, but also allow R2 to be removed from the box with minimal effort. Mission accomplished! If all goes according to plan, R2 is ready to blast off with Eric Boe and the STS-133 crew on **November 1, 2010 at 4:40 pm EST.**



Robonaut 2 with crew of STS-133

**Materials: (per group)**

- Student sheet (next page)
- Project materials: one potato chip, paper, cardboard, glue, tape, string, cotton balls, plastic wrap, toothpicks, popsicle sticks, foil, other materials you have on hand, items students may suggest to bring in for everyone's use, and a preaddressed mailing label to your school
- Graph paper and pencils



Note: Be sure each team has the same materials available to them.

**Procedure:**

1. To find more background material to begin discussing the manufacturing engineering and packaging process, go to this complete lesson at: <http://www.tryengineering.org/lessons/shipthechip.pdf>.

2. Divide students into groups of 2-3 students, providing a set of materials per group.

3. Explain that the students must work as teams of "engineers" who have been given the challenge of designing the smallest, lightest package of all the engineering teams in your classroom that will protect a single potato chip (representing the "passenger") through the mail from a remote location to your school. The arriving chip must be edible, although students shouldn't eat them after their journey through the postal system. (This rule simple prevents students from applying any substance to the chip to make it stronger.)

4. Students will need to research their local postal regulations to determine if there are minimum sizes, weights, or other considerations they'll need to consider in their design.

5. Students will first meet, plan, and draw their planned package.

6. Next, students will construct their packages and provide them to the teacher for mailing.

7. Once all mailed packages have arrived back at the school, students will weigh, measure, and evaluate the contents of the packages.

8. Students will complete the evaluation sheet and present their reflections to the class.



## Student Worksheet and Evaluation for "Ship the Chip"

Engineering Team Names:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Date: \_\_\_\_\_

**Engineering Teamwork and Planning:**  
You are a team of manufacturing engineers given the challenge of designing the smallest, lightest package of all the engineering teams in your classroom that will protect a single potato chip - your "chimpanaut" (provided by your teacher) shipped through the mail from a remote location back to your school.



**• Planning and Design Phase**

Each team should be provided with a set of materials. Review these as a group and draw your packaging design on a sheet of graph paper. Think about package strength, size, and weight as you design your package. You might want to consider how well your package will survive if it finds itself at the bottom of a stack of heavy boxes during mailing! There are also several rules you must follow, which your teacher will review with you so your package is not disqualified.

**• Construction Phase**

Build your package, and then complete the questions below (on the back side of this paper):

1. How similar was your design to the actual package you built?
2. If you found you needed to make

changes during the construction phase, describe why you made the revisions.

**• Shipping Phase**

Your teacher will devise a mailing system for all the packages created in your classroom. Be sure your package has a unique code on the outside to identify to which team it belongs. Packages may be marked fragile. No overnight shipping!

**Evaluation Phase:**

Once all packages have arrived in the mailbox back at your school, you will work in teams to evaluate the packages. You will not evaluate your own package.

**Scoring:**

The following three measurements must be made for each incoming package (the mass and volume measurements must be rounded to three significant digits):

1. Mass of the package in kilograms. (Use a metric scale to determine mass.)
2. Volume of the package in cubic centimeters. (To find the volume of a rectangular box, multiply the length x width x height of the box after measuring each in centimeters.)
3. Intactness score of the "chimpanaut" on the following scale:
  - 100 points: like new; perfect
  - 50 points: slightly damaged; cracked, but still in one piece
  - 10 points: broken in 2-5 pieces
  - 5 points: broken in 6-20 pieces
  - 1 point: broken into more than 20 pieces; crumbled

Determine the overall score for each package to determine the top scoring "engineering team." Use the following equation:

$$\text{Overall Score} = \frac{\text{Intactness score (c)}}{[\text{mass in kg (a)} \times \text{volume in cc (b)}]}$$

Example:  
 mass (a) = 0.145 kg  
 volume (b) = 240 cc  
 intactness score = 100  
 $100 / 0.145 \text{ Kg} \times 240 \text{ cc} = 2.87$

Make a chart to keep track of the packages for each engineering team in your class and see who has the best overall score.

**Reflection:**

1. What aspect of the design of the package that had the best overall score do you think led to its success?
2. If you had a chance to do this project again, what would your team have done differently?

**Presentation:**

As a group, make a presentation to the class about what you learned during this activity and how this activity illustrates how important packaging design and engineering are to the process of shipping delicate materials, such as R2 or your "chimpanaut."



(Top) Engineers placing R2 in his protective box  
(Bottom) R2 secured in his box for the STS-133 mission



## Air Force Association Partnership

CAP applauds the Air Force Association each quarter for the many years of financial support to CAP's units and teacher members to perpetuate the AE mission of both the AFA and CAP. Once again, CAP sends appreciation to the AFA for its belief in the worth of CAP's youth development programs. Congratulations to this quarter's AFA/ CAP Educator \$250 Grant Winners to complete excellent AE projects and programs, as noted below:

- **Melanie Byers**, Kettering Middle School, OH - "Design and Physics of Rocketry Project"
- **Danna Chatwell**, Woodlawn Beach Middle School, FL - "Flight Simulator Design and Flight Project"
- **Carla Chin**, San Jose Catholic School, FL - "Aerospace Physical Fitness and Solar System Project"
- **Brandi DeSandro**, Pike County Indian Education, AL - "Aerospace History, Career Exploration, and Exhibit Project"
- **Grant Felice**, Mason County Middle School, KY - "Logitech Physics, Geography, and Geometry of Flight Project"
- **Kelly Flindt**, Owasso 7th Grade Center, OK - "Venier Sound Meter and Glider Project"
- **Revonne Hammond**, Oakmont Elementary School, OH - "National Museum of the USAF Tour and Hubble Imax Trip"
- **Tracy Huemoeller**, Anthem School, AZ - "Third Grade ACE Program Component Project"

- **Heidi Humecky**, McKelvie Intermediate School, NH - "5th-6th Grade After-School Aerospace Club"
- **Jennifer Kane**, Rio Hondo Elementary, CA - "AEX Award Program with Griffith Observatory Trip"
- **Brenda Kuhns**, Jardine Middle School, KS - "Venier Labquest and Photogate/Laser Physics Project"
- **Matthew Maisano**, Conestoga Valley High School, PA - "Airport Career Exploration & Discovery Flight Experience"
- **Cynthia Miller**, Anthem School, AZ - "Lunar Station Project for Tosito's Aerospace Challenge"
- **Jean Pelezo**, Morgantown Road Elementary School, NC - "Family Night Star Gazing Party"
- **Dorinda Risenhoover**, Union City Public Schools, OK - "Motions and Forces Rocketry Project"
- **Ricardo Soria**, Choctawhatchee High School, FL - "Engineers for America STEM Initiative"
- **Lynn Toney**, Boaz Intermediate School, AL - "Planet Earth Environmental Project"
- **Megan Tucker**, Kenwood Elementary, FL - "Space Exploration Educators Conference Presentation"

To find out about all the partnership programs between the AFA and CAP, please go to the AFA Partnership link at [www.capmembers.com/ae](http://www.capmembers.com/ae). If you are not a member of a local AFA chapter, you can find information on how to become a part of the AFA's community outreach programs in your area at that

same Web site.

Some photos from recent CAP unit grant recipients show the diversity of programs conducted to inspire youth toward STEM subjects and careers:



Top: The Chicago Composite Squadron, under the leadership of 1Lt Barb Buckner, partnered with the Air Force Academy High School to conduct a rocketry program funded by an AFA Grant. Bottom: The SER-GA-023 Blue Knight Squadron, under the leadership of Capt Geoffrey M. Chandler, held a community Aerospace Fair with the funds received from the AFA Grant.



### CAP and STARBASE Collaboration

The CAP is working with DoD STARBASE Academies across the nation to help perpetuate teacher and student STEM subject interest. By providing CAP programs and products, teachers can continue to inspire students toward STEM careers. At printing, over 30,000 students had been provided CAP resources to promote aerospace education and the CAP's Drug Demand Reduction Program's "Better Things to Do Than Drugs" message to young people.



Eager young rocketeers during CAP Sq AL-118's Community Rocket Day in Pell City; funded by AFA grant. (Photos by Beth Shurbutt, PAO)



### CAP and AFA - Supporting STEM with ACE

The Air Force Association and CAP are supporting a new college-level ROTC Arnold Air Society and Silver Wings initiative, the Elementary STEM Orientation (ESO) Program. ROTC cadets are mentoring elementary students toward an interest in STEM subjects and careers by using CAP's K-6 Aerospace Connections in Education (ACE) Program. It is hoped that through mentorship and school collaboration these positive role models will help young students choose positive personal and professional life goals.



## From The Deputy Director's Desk.....Dr. Jeff Montgomery



### AE Summit 2010

Another successful AE Summit was recently completed at the National Board and Conference in San Diego on September 2, 2010. Twenty CAP members attended with most being either a Region Deputy Chief of Staff for Aerospace Education or a Wing Director of Aerospace Education. The goal of this year's summit was to take inventory of where CAP's AE program is today and where we are headed in the future. The summit was presided over by Lt Col Mike McArdle, the

National AE Advisor, with some of NHQ AE staff also in attendance. Status reports were given on all of the current and upcoming AE products and programs. Future curriculum programs currently under development include robotics, remote control aircraft, and satellite imagery. Collaborative partnership initiatives are underway with STARBASE, AFJROTC, Aeronautical Modeling Academy, and National Flight Academy which should greatly enhance the AE program for cadets and schools across America. Program updates will continue to be disseminated via the AE Web site

and in CAP's AE news publications. Lt Col McArdle is creating a leadership team to continue improving the many aspects of CAP's AE mission to include better communication with and support to the AEOs in the field. Lt Col McArdle will be accepting applications for these positions very soon. More detailed minutes of the summit are being sent to the region and wing Directors of AE. They, in turn, will send this information to their field Aerospace Education Officers, who are encouraged to dialogue with DAEs about ideas, concerns, and, of course, best practices to share nationwide.

### National AE Awards

The following Aerospace Education awards were announced at the September 2010 National Board and Conference in San Diego:

**AEO of the Year** – Maj Robert Thomas, Walco Composite Sq, Wisconsin Wing  
**Teacher of the Year** – Rachael Manzer, East Hartland, Connecticut  
**Frank G. Brewer CAP Memorial AE Awards:**

- Cadet-C/Lt Col Haley Blevins-MER
  - Senior-Lt Col Randy Carlson-RMR
  - Individual/Organization-Evergreen International Aviation-PCR
  - Lifetime-Lt Col John Johnson-MER
- AFA AE Cadet of the Year-** C/Lt Alexa Solorio – Arizona Wing  
**AE Mission Awards:**  
National 1st Place – Wisconsin

National 2nd Place – Texas  
National 3rd Place – Florida  
**Region Mission Winners:**  
NER – New York  
MER – North Carolina  
SER – Florida  
GLR – Wisconsin  
NCR – Minnesota  
SWR – Texas  
RMR – Utah  
PCR – California

**National AE Award Winners (pictured on right with Maj Gen Amy S. Courter, CAP National Commander):**  
Top left to right: Brewer Organization, Evergreen International; CAP Teacher of the Year, Rachael Manzer; Brewer Cadet, C/Lt Col Haley Blevins;  
Bottom left to right: Brewer Senior, Lt Col Randy Carlson; AEO of the Year, Maj Robert Thomas; Brewer Lifetime, Lt Col John Johnson



### Aerospace Dimensions

The second edition of the Aerospace Dimensions modules has been completed. Beginning Oct 1, the modules will be available as part of the new member packet for cadets. Cadets using the current modules may continue to use them or may switch to the new modules. Online tests will be available for both editions. By January 1, 2012,

we anticipate that all cadets will be using the second edition modules. In October, NHQ AE will send a copy of



the new modules to each cadet and composite squadron, each group, wing, and region AEO, and to the aerospace education members. Please be on the lookout for this new set of excellent middle school-leveled AE resources. These products are also available on eServices, and for download from the Lessons and Resources section of [www.capmembers.com/ae](http://www.capmembers.com/ae).



## REGION TO REGION

For information on other pertinent dates for CAP Members and Educators, go to our calendar at [www.capmembers.com/ae](http://www.capmembers.com/ae).

### NORTHEAST REGION

**October 12-13**  
The New Jersey Science Convention will be held at the Garden State Exhibit Center, DoubleTree Hotel, and Holiday Inn in Somerset, New Jersey.  
<http://www.njsc-online.com/>

**October 22-24**  
The Northeast Region of Civil Air Patrol will hold an Aerospace Education Officer School at the USS Intrepid Sea, Air, and Space Museum in New York City, New York. For registration and more information, visit:  
<http://www.ner.cap.gov/ae/AEOAcademy.php>

### MIDDLE EAST REGION

**October 10-24**  
The first annual USA Science & Engineering Festival will be held on the National Mall and surrounding areas in Washington, D.C. This is a FREE event with a culminating event of more than 1500 hands-on science activities on October 23-24.  
<http://www.usasciencefestival.org/>

**November 3-5**  
The South Carolina Science Council will hold its annual conference at Myrtle Beach, South Carolina.  
<http://www.southcarolinascience.org/conference.html>

**November 11-13**  
National Science Teachers Association will hold an area conference at the Hilton Baltimore in Baltimore, Maryland.  
<http://www.nsta.org/conferences/2010bal/?lid=hp>

### GREAT LAKES REGION

**November 13**  
The Detroit Area Council of Teachers of Mathematics and The Metropolitan Detroit Science Teachers Association will hold their joint Fall Conference at Lamphere High School in Madison Heights, Michigan.  
<http://www.dactm.org/mc/page.do?sitePageID=90324>

### SOUTHEAST REGION

**October 19-21**  
The National Business Aviation Association (NBAA) will hold its 63rd Annual Meeting and Convention at the Georgia World Congress Center in Atlanta, Georgia.  
<http://web.nbaa.org/events/amc/2010/>

**October 31-November 3**  
STEMtech, the League for Innovation in the Community College's first annual Science, Technology, Engineering, and Mathematics conference, will be held at the Walt Disney World Swan and Dolphin in Orlando, Florida.  
<http://www.league.org/2010stemtech/>

**December 2-4**  
National Science Teachers Association (NSTA) will hold an area conference at the Gaylord Opryland Hotel & Convention Center in Nashville, Tennessee.  
<http://www.nsta.org/conferences/2010nas/?lid=hp>

### NORTH CENTRAL REGION

**October 28-30**  
National Science Teachers Association (NSTA) will hold its first fall area conference at the Kansas City Marriott Downtown in Kansas City, Missouri.  
<http://www.nsta.org/conferences/2010kan/?lid=hp>

**January 19-22, 2011**  
The Association for Science Teacher Education (ASTE) will hold its International Conference at the Hilton Minneapolis in Minneapolis, Minnesota.  
<http://theaste.org/meetings/2011conference/>

### SOUTHWEST REGION

**October 30-31**  
The Fort Worth Alliance Air Show will be held at Fort Worth Alliance Airport in Fort Worth, Texas.  
<http://www.allianceairshow.com/>

**October 30**  
Sally Ride Science Festival for 5th-8th grade girls will be held at the University of Texas at Arlington in Arlington, Texas. The featured talk will be given by educator astronaut, Barbara Morgan.  
<http://www.sallyridescience.com/festivals/10uta1030>

**November 6**  
Sally Ride Science Festival for 5th-8th grade girls will be held at Rice University in Houston, Texas.  
<http://www.sallyridefestival.com/festivals/10rice.1106>

### ROCKY MOUNTAIN REGION

No events for this issue.

### PACIFIC REGION

**October 22-24**  
The California Science Education Conference will be held in Sacramento, California.  
[http://www.cascience.org/csta/conf\\_home.asp](http://www.cascience.org/csta/conf_home.asp)

**January 4-7, 2011**  
The 9th Annual Hawaii International Conference on Education will be held at the Hilton Hawaiian Village Beach Resort & Spa in Honolulu, Hawaii.  
<http://www.hiceducation.org/>

### Special Events

**November 1, 2010**  
Launch target for final mission of orbiter Discovery.

