



May - June 2004

News

AEROSPACE EDUCATION

Inspiring Students to Excel



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If you have news, events, or ideas we might consider for the newsletter, please submit them electronically to jstone@cap.gov.

AVIATION AND SPACE IN ATLANTA

The 2004 National Congress on Aviation and Space Education conference in Atlanta, GA was one of the best ever. One picture is worth a thousand words.....



Ken Blackburn - General Assembly Speaker



Winner of Educator Space Camp Door Prize with General Bowling, CAP



Scott Crossfield with young NCASE attendees



Concurrent Session on Kites



Concurrent Session - A Family Affair



Tuskegee Airmen sign and inspire!



Dr. Kochersberger and the Wright Experience

Register now for the 2005 National Congress on Aviation and Space Education conference to be held in the Washington DC area April 27-30. For registration and flyer for 2005, go to <http://www.cap.gov/events/nc/ncase05www.pdf>.

AIAA and CAP: PARTNERSHIP TO ENGAGE THE NEXT GENERATION



Space Rocks! Kids Festival at the World Space Congress.

The American Institute of Aeronautics and Astronautics (AIAA) and CAP have forged a unique partnership to benefit educators. The American Institute of Aeronautics and Astronautics is the largest technical society for aerospace professionals worldwide, devoted to the progress of science and engineering in both aviation and space.

The AIAA's professional membership - 30,000 engineers, scientists, researchers, educators - play principal roles in aerospace design and research. Therefore, the CAP/AIAA partnership enables critical hands-on activities and workshops, as well as high visibility events - leveraging the professional, technical base of AIAA members with fresh perspectives from the leaders at CAP.

Additionally, CAP AEM members are invited to become AIAA Educator Associate members. Through this membership, a classroom teacher may apply for a classroom grant of up to \$200 from the AIAA Foundation. The grants are designed to excite students about hands-on math and science activities in the classroom. Teachers may qualify for one grant per lifetime.



Students flying kites with teacher, Ellen Holmes, AIAA Educator Achievement Award winner, at Fairmont Elementary School in Bangor, ME.

The AIAA Foundation also provides recognition for teachers. Bi-annually, AIAA names up to seven teachers and presents each the AIAA Foundation Educator Achievement Award. The award, given at the AIAA Honors Night Banquet, includes a trip to the event for the teacher and a guest.

Other benefits of becoming an AIAA Educator Associate member include free advance registration to AIAA technical conferences, participation in local section events, access to classroom mentors, and discounts on technical publications and special educational events.

12-14 July 2004

AIAA will hold the first "Passport to the Future Educator Workshop" in Ft. Lauderdale at the 40th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit. This three-day workshop, co-sponsored by CAP and the Challenger Learning Center for Space Education, will include exhibit hall guest speakers, hands-on activity seminars which will be advised by members of AIAA Technical Committees, plus, participation in the Joint Propulsion Conference. For more information go to: www.aiaa.org and click on confer-

ences/workshops.

28-30 September 2004

"Education Alley" will return to the Space 2004 Conference in San Diego, CA. Education Alley is an interactive exhibit designed for teachers and students to hear speakers, meet aerospace professionals and experience aerospace education demonstrations by NASA, CAP, Space Day, FIRST, USA Today and others.

To learn more about AIAA educational programs, please go to their web site, www.aiaa.org. If you have questions, please contact Lisa Bacon at lisab@aiaa.org. AIAA and CAP are charting a course for the next generation of scientists, pioneers and explorers. Get your passport to the future and join them!

Cappy's Quiz



What was the name of America's first manned space flight program?

1. Project Apollo
2. Project Gemini
3. Project Mercury
4. Project Redstone

AEO NEWS AND VIEWS



AEROSPACE EDUCATION FOUNDATION GRANTS

In our last AE newsletter, we announced the winners of the winter cycle for Aerospace Education Foundation's CAP unit grants. However, it's not too soon to be thinking about the next unit cycle. The deadline for the next cycle is June 30, 2004. Be sure to get your applications in on time. Remember, if you haven't won a grant in over a year you are eligible to apply again. The grants are for \$250 each and are awarded to CAP units for promoting aerospace education. One other reminder for our recent winners, if you haven't already submitted the form on how you spent your grant money please do so. Submit to HQ CAP/LMA. **This applies to both CAP unit and teacher grant winners.** We are very grateful for the continued support AEF provides CAP.

YEAGER TESTS AND SPECIALTY TRACK 215 TESTS

It all started in early December 2003, when Civil Air Patrol Lieutenant Colonel Barry Herrin, Georgia Wing's Group 2 commander, called the Aerospace Education staff at National Headquarters with a simple question. "Why can't the Yeager test be on line?" Why not indeed? After months of testing and coordination to assure test integrity, the Aerospace Education Program for Senior Members test, known as the Yeager test, and the Aerospace Education Officer's specialty track



(215) tests for Technician, Senior, and Master, are now on line! Both the Yeager and the 215 Specialty Track Tests can be accessed at: <https://ntc.cap.af.mil/tests/default.cfm>

The tests had not been on line more than a few hours when the South Dakota Wing Director of Aerospace Education, Civil Air Patrol 2nd Lieutenant Eric Hineman, enthusiastically wrote to National Headquarters, "I really like having the AEPSM and the AEO tests online. I finally got them both done because of them being online." Thank you Lt Hineman; and thank you Lt Col Herrin - another step in meeting our membership's needs has been taken!

NATIONAL AEO SCHOOL

The National AEO School will be held in Pensacola, Florida, from June 24-27, 2004. For registration and more information, go to: <http://level2.cap.gov/index.cfm?nodeID=5176>.

Model Rocketry Program

The newly approved Model Rocketry program is on its way to every unit in the Civil Air Patrol. The new regulation, CAP Regulation 50-

20, CAP Model Rocketry Program, the accompanying CAP Model Rocketry book, and the mandatory Model Rocketry tests (CAPT 50) were mailed at the beginning of April in the all-unit mailout. The new program is about the basics, and was developed so that even the youngest cadets could participate in and have fun building inexpensive rockets. The program was also developed to include those cadets who live in areas where solid fuel rockets are against the law. When cadets complete this new program they are eligible for the official Civil Air Patrol Model Rocketry Badge, available from www.capmart.org/. While the new program is an introduction to the world of model rocketry, it does not pretend to be the last word on the subject. Beyond this basic introduction, the possibilities for further rocket flight activities are almost unlimited. The degree of sophistication in engaging in model rocketry activities is limited only by one's imagination. Model rocketry is also an excellent vehicle for getting across the various aspects and concepts of aerospace, including Newton's laws of motion. To create an advanced rocketry program, units are encouraged to contact the National Association of Rocketry (NAR) at: <http://nar.org>.



REGION TO REGION

NORTHEAST REGION

May 8

The New Jersey Aviation Conference is the premier annual event celebrating New Jersey aviation. This event will be held at McGuire Air Force Base, NJ. For more information, go to:

<http://www.njaviation.com/conference/nj2004.html>.

May 20-24

The York County Astronomical Society will be presenting the 15th annual Mason Dixon Star Party at a new location at the Codorus State Park near Hanover, PA. For more information, go to:

<http://masondixonstarparty.org/>.

June 27-July 2

20th Annual Conference on Secondary School Mathematics, Science and Technology will be held at Phillips Exeter Academy, 20 Main St., Exeter NH. For more information, go to: <http://matconf.exeter.edu/>.

MIDDLE EAST REGION

June 10

8th Annual NASA/JPL Space Science Symposium will be held at The Hamilton Crowne Plaza, Washington, D.C. For additional information, go to:

<http://acquisition.jpl.nasa.gov/boo/conferences.htm>.

GREAT LAKES REGION

July 11-13

The Digital Library for Earth System Education (DLESE) annual meeting will be held at the University of Wisconsin in Madison, WI. For more information, visit : <http://www.dlese.org/annualmtg/2004> or contact David Steer;

phone 330-972-2099; email steer@uakron.edu.

July 27-Aug 2

The world's greatest general aviation event, EAA (Experimental Aircraft Association) AirVenture Oshkosh, is launching the next century of flight during EAA AirVenture 2004, which will be held at Wittman Regional Airport in Oshkosh, WI. For additional information, go to: <http://www.airventure.org/>.

SOUTHEAST REGION

May 21-23

First annual Star Party for the Flint River Astronomy Club will be held at Camp McIntosh (Indian Springs State Park) in Jackson, GA. To find out more, go to: www.flintriverastronomy.org/GSY2004.htm.

June 5-6

"Wings of Victory" Maxwell-Gunter Air Force Base Air Show in Montgomery, AL. will commemorate the 60th anniversary of D-Day and feature the United States Air Force Thunderbirds. To find out more, go to: <http://www.maxwell.af.mil/airshow/>

June 22-25

A conference sponsored by the Alabama Aerospace Teacher's Association in partnership with the Von Braun Scholars Program will teach more about the new NASA Destiny Classroom Program. The event will be held at Foley High School in Foley, AL. To register, visit the website at: <http://www.aata.net/conference>

July 12-14

Passport to the Future Teacher Workshop in Ft. Lauderdale, FL. This AIAA workshop will be on engineers and educators working together in the classroom. More information can be found by email to **Lisa Bacon at lisab@aiaa.org**.

NORTH CENTRAL REGION

June 4-6

Fly Iowa, Iowa's annual air fair will be at Washington Municipal Airport in Washington, Iowa. Go to <http://www.flyiowa2004.com/index.html> to find out more.

June 25-27

5th annual Balloons in June will be held at the Clinton Municipal Airport and on the Riverfront in Clinton, IA. For more information, go to: <http://www.balloonsinjune.us/pages/1/index.htm>.

SOUTHWEST REGION

June 4-5

Bartlesville, OK - National Biplane Exposition & Convention; Static displays, forums, seminars & exhibits. Biplane pilots & crews and National Biplane Association members are admitted free. Info: **Charles W. Harris at 918-622-8400**.

June 22-25

Aerospace Education Workshop will be held at Tarrant County College in Fort Worth, TX. Contact Chuckie Hospers, Vintage Flying Museum by phone at: **817-624-1935 or email chuckie@vintageflyingmuseum.org** or contact Debra Myers, Federal Aviation Administration at: **817-222-5833** - email: debra.myers@faa.gov.

July 22-24

Embry-Riddle Aeronautical University and AeroRacers Inc. proudly present the second annual Great American Aero Derby (GAAD). This event will be held in Prescott, AZ. For more information, go to: <http://www.aeroderby.com/>.

AEO IN THE SPOTLIGHT... Lt Col Ronald E. Sandhop, CAP

Lt Col Ronald Sandhop joined Civil Air Patrol as a cadet in May 1963. Ron held many positions in the Wenatchee Composite Squadron, Washington Wing, and rose to the rank of Cadet Captain. He later became a Cadet Lt Col while involved in AFROTC at Central Washington State College. After graduation from Central Washington State in 1969, he was commissioned a 2nd Lieutenant in the United States Air Force (USAF). During his Air Force time (1969-1981), he was assigned to such locations as U-Tapao RTNAFB Thailand, Hill AFB Utah, and Wurtsmith AFB Michigan. Ron remained an active CAP Senior Member while serving in the United States Air Force.

Upon completion of his military service, Lt Col Sandhop (then USAF Captain Sandhop) was hired as a civil servant with the USAF. Ron's first aerospace education assignment was Director of Aerospace Education in the Rocky Mountain Region in 1981. Lt Col Sandhop later worked as the Internal Aerospace Education Officer, assisting his wife, Jane, who was the Oklahoma Wing Director of Aerospace Education. A



Lt Col Ronal Sandhop, CAP

highlight of this assignment was to rejuvenate the aerospace education content of Oklahoma Wing Encampments in the 90's while serving as Encampment Commander for two years. He also served as the Air Force Association Aerospace Education Vice President for the Tinker Chapter and co-chaired a NASA Community Involvement Project that culminated with a teacher workshop. His current assignment is Director of Aerospace Education for Oklahoma Wing under the command of another aerospace educa-

tor, Virginia Keller.

Lt Col Sandhop has remained active with CAP throughout his career in the Air Force and as a civilian working for the Air Force. He has held many positions and handled different responsibilities within Civil Air Patrol. Ron has earned many awards in CAP including the Gill Robb Wilson in 1986; Paul E. Garber Award in 1985; and the Grover Leoning Award in 1985. He has also received the Air Force Association Medal of Merit in 1992.

Lt. Col Sandhop is dedicated to Civil Air Patrol's Missions for America -- especially in Aerospace Education. Ron has shown through his years of service in CAP that he truly believes in aerospace education as a building block to the cadet and senior member programs. Through his involvement in conducting seminars, conference sessions, and classes, he has shown his commitment to Civil Air Patrol and Aerospace Education. The list of achievements and awards are amazing! We congratulate Ron on his career with Civil Air Patrol and wish him the best as he continues his efforts as an aerospace educator. ■

Region to Region (continued from page 4)

ROCKY MOUNTAIN REGION

July 12-22

Educator workshop - NASA Satellites Study Earth's Atmosphere: CALIPSO, CloudSat and Aura working with the GLOBE Project, Fort Collins, CO. Go to: <http://www-calipso.larc.nasa.gov/> and click on **OUTREACH**.

PACIFIC REGION

May 15-16

The Jet Propulsion Laboratory

at Pasadena, CA will once again open its doors to the public during its annual Open House. For more information, go to: <http://www.jpl.nasa.gov/psd/oh.cfm>

AEOs and AEMs - Who are They?

This newsletter serves two groups of aerospace educators who both share the same mission of Civil Air Patrol's MARS program - to build our nation's future aerospace workforce. The CAP Aero-

space Education Officers (AEOs) are Senior Member volunteers whose quest is to promote aerospace education as an integral part of the CAP cadet and senior member programs and to encourage teachers to become Aerospace Education Members (AEMs). Likewise, the AEMs fulfill CAP's educational outreach program to promote the wonders and possible career opportunities of aerospace in our nation's classrooms. It is hoped that CAP's AEOs and AEMs will join hands to support each other as we all strive to Make Aerospace Real for Students! ■

IN THE AEM SPOTLIGHT...Anita Pahman

Ms. Pahman has been actively involved in aerospace education since she attended Space Camp in 1990. In 1994, her flight to San Diego in an Air Force cargo plane with other Civil Air Patrol Educators, further fueled her fire for aerospace education. She, along with the other CAP Educators, attended the National Congress on Aviation and Space Education. A few of the aerospace legends she met included: Scott Crossfield, Chuck Yeager, Hoot Gibson, Mary Feik and Konrad Dannenberg. These experiences were a turning point in her teaching career. Anita has been on the volunteer staff for NCASE for several years. She was also chosen to be a teacher participant in the Brewer National Conference on Aerospace Education in Washington, D.C. in 2002.

Ms. Pahman was one of eight teachers to represent the state of Alabama in Russia in 1997 with the International Aerospace Connection sponsored by the University of Alabama Huntsville and the State Department of Education. She taught science lessons for some of the students at the International Space Camp in Siberia and spoke at the International Conference for Educators in Russia. She was asked to present at the International Conference for the National Geographic the lesson on "GEOGRAPHY FROM SPACE." She has presented this lesson, as well as other lessons, at the National Congress on Aviation and Space Education. These lessons have been published in The Alabama Geographic Alliance's GEOLINK and Newsletters, the National Congress on Aviation and Space Education curriculum guide, the International Conference for Educators, the Alabama Education Association and Alabama Aero-space Teachers' Association (AATA) publications. She was one of 30 teachers nationally chosen for the National Space



Biomedical Research Institute in 2001 and has done presentations at the National Science Teachers Association.

Even before "Spirit" landed on the surface of Mars, the students in Anita Pahman's classroom took a Martian trip in a real-time simulation at the Challenger Center in Birmingham, Alabama in 2003. With a grant from Hats-Stedtrain in Huntsville and a matching Wal-Mart grant, the class experienced a virtual reality trip to the Red Planet. Her 9th grade Computer Applications class was the first to visit the Moon via "Moonlink" in 1999 with a grant sponsored by the AATA and the Space Explorers Program.

Technology is used daily in the third grade classroom that Anita teaches at Mt. Hope School in Lawrence County, Alabama. Her students just recently completed an exciting day taking pictures from the International Space Station using the EarthKam digital camera. Anita was one of 20 teachers of the 50 states to be chosen in the summer of 2003 to learn how to use the EarthKam project sponsored in part by NASA and the National Geographic. Anita has also been trained by the GLOBE and S'COOL programs to supply scientists with weather in Mt. Hope, Alabama.

As President of the Alabama Aerospace Teachers' Association in 2000-2003, Anita has assisted with the planning of a National Aerospace Teachers' Association. In conjunction with this endeavor, aerospace enthusiasts are being

contacted to further the promotion of aerospace education in the U.S. The focus is to make aerospace education a viable entity in teaching of all subjects in the K-12 schools in America. AATA has a large teacher membership and has sponsored thousands of students throughout the state in competitions such as "Astro Art" and "Astro Bowl". Anita currently is serving as Parliamentarian.

Anita received the Von Braun Educator of the Year Award in 1999. She has worked with the AGA, the National Geographic Alliance and NASA in promoting geography from space. Anita, the 1999-2000 Alabama State Coordinator for Geography Awareness Week, utilized the theme Geography and Technology: Global Positioning Systems. As one of two people selected to represent Alabama, she spent two weeks in Washington, D.C. and a week at Texas A&M in preparation of training teachers.

Ms. Pahman's philosophy of teaching is that every child has the potential to achieve anything that they want in life. Each child was born with many talents that are not realized. However, to become successful requires that each child be taught to set personal goals for themselves and then believe that they can be achieved. She uses the Chinese proverb: Tell me, I forget; Show me, I remember; involve me, I understand. All children can fly if given their wings. Aerospace educators can give them their wings.

CURRICULUM CORNER

LIFT AND WEIGHT

The activity for this edition of the newsletter comes from *NASAexplores* (also an exhibitor and presenter at NCASE 2004). This is a good activity to introduce the forces of flight to young children. The website is: www.nasaexplores.com.



Objective: Students will learn how a plane's flight is affected by the forces of lift and weight.

Grade Level(s): K-4

National Standards:
Science Standards (Source: National Research Council)

- *Content Standard A: Science as Inquiry*
 - Abilities necessary to do scientific inquiry
 - Understanding about scientific inquiry
- *Content Standard B: Physical Science*
 - Position and motion of objects
- *Content Standard E: Science and Technology*
 - Abilities of technological design

Background Information:

The way an airplane flies may seem magical. How can something so

big and so heavy fly? Several forces act on an airplane. A force is a push or a pull on something. You use force when you throw a ball, pull a wagon, or walk. When you walk, you push backward on the floor, and the resistance from the floor pushes you forward. Forces always work in pairs, on different bodies, in opposite directions, and at the same time.

Four main forces act on airplanes. **Lift** acts upward and allows the airplane to fly. The **weight** of the airplane acts downward. **Thrust** is the force that moves the airplane forward. The force that holds an airplane back is called **drag**.

Lift is generated as a result of the special shape of an airplane's wing. The top of the wing is curved more than the bottom of the wing. The air that flows over the top of the wing moves faster than the air moves along the bottom. The air that is moving faster exerts less force than the slower moving air. Thus, the air pushes down on top of the wing less than the air pushes up on the bottom of the wing. The greater push upward is the lift of the wing. Lift holds an airplane up.

Lift acts in opposition to the weight of an airplane, which acts downward. **Weight** is the force generated by gravity. Weight always pulls downward toward the Earth. For an airplane to fly, lift must equal weight. Weight holds an airplane down.

The way the four forces act on the airplane determines what the plane will do. When the forces are balanced, a plane flies in a level direction. If the forces of lift and thrust are greater than the forces of gravity and drag, the airplane will go up or ascend in the air. If gravity and drag are greater than the forces of lift and thrust, the plane goes down or descends. Just as drag holds something back as a response

to wind flow, lift pushes something up. The air pressure is higher on the bottom side of a wing, so it is pushed upward.

Materials: Clear funnel, ping-pong ball, straws, duplicating paper, and student sheets

Procedure:

1. Discuss the **Background Information** with students.
2. Distribute the Student Sheets. Have students look at the drawing as you describe each force.
3. Tell them, "Thrust, drag, weight, and lift are the four forces that work together to make things fly. Having stronger muscles helps you jump higher. This is thrust. That is the force that pushes the plane when it is flying. A parachute keeps you in the air longer. This is drag, the pushing of air against things that fly. Weight is the force that holds you to the ground. Lift is a push that comes from the air. Wearing wings or holding helium balloons could help you jump higher; this is lift. Planes and birds have to be moving to get enough lift to fly. Hot-air balloons are light enough for their size that the air will lift them up—even if the balloon is not moving."
4. Tell the students, "Air is pretty pushy stuff. It never pulls or sucks; it pushes. Air is pushing on us right now from every direction. Why



Lift and Weight (continued)

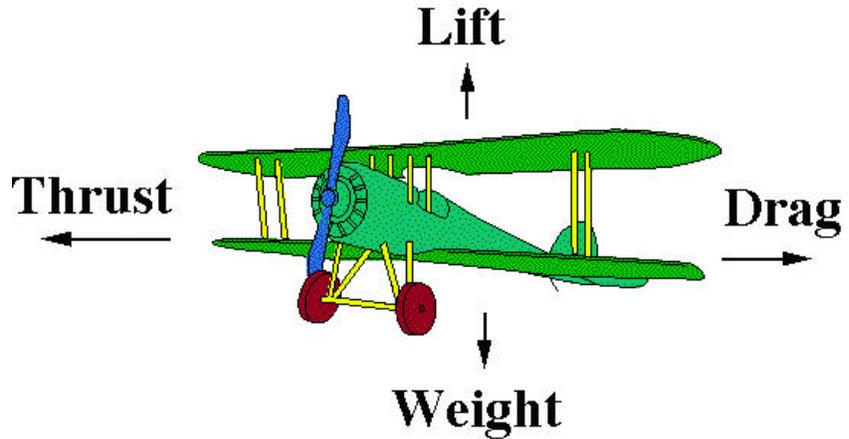
don't we feel it? We're so used to it! The endless push of air is called air pressure."

- Complete the Lift Demonstration. Bend your head back so that you will be able to blow the ping-pong ball toward the ceiling. Put the ball in the top of the funnel, and blow hard and fast into the stem of the funnel. Have the students share what happens orally. Bend your head down so that you will be able to blow through the funnel straight down toward the floor. Hold the ball inside the funnel close to the hole and take a deep breath and blow into the small end as you let go of the ball. The ball does not fall but stays lodged in the end of the funnel.
- Ask the students, "Why did this happen?" *By blowing into the funnel, the speed of the air is faster above the ping-pong ball than below. When the air reaches the large section of the funnel, it spreads out and slows down. The pressure is less where the air is going faster—above the ball—and greater where the air is going slower—below the ball. A force is created going from high to low pressure, and this keeps the ball up even though gravity is trying to pull it down.*
- Have the students jump into the air from a standing position. Discuss what happens. *They fell back to Earth because lift could not overcome their weight. In order to stay up, they two forces must be equal on a plane.*
- Have students complete the activity on the Student Sheet.



The Four Forces Of Flight Student Sheet

Name: _____ Date: _____



- Fold a piece of paper in half to make a tent.
- Put the paper tent on your desk.
- Use the straw to blow under the tent.
- Explain what happens.

- Blow harder.
- Explain what happens.

- Now, blow hard against the side of the tent.
- Explain what happens.

Cappy Quiz answer:

3.Mercury