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# National Association of Rocketry Educator's Newsletter

October 2011

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Who's fifty-four?

October is the anniversary month for the Space Age. Humanity put its first object into Earth orbit on October 4, 1957 when Sputnik I was launched. In one sense, 54 years is a long time, but in the scope of human history we're still at the beginning of the Space Age. Scientists and engineers have proven so much of what we can do in building spaceships to reach beyond our planet. And yet the rest of the solar system and all the stars above await us. Do your students dream of exploring space? Can they imagine they will be the ones to set new records like was done with the Sputnik launch? Start with this history lesson to talk about rocketry. Then maybe you'd like to have your class launch a model rocket to celebrate the anniversary. Rocket science is part of our history, can your students make it part of our future?

Aim high!

Vince Huegele
NAR Education Chairman



2012 Team America Rocketry Challenge (TARC) Competition

Registration for the 2012 Team America Rocketry Challenge is now open. The world's largest rocket competition is open to 1,000 student teams in grades 7-12 from any U.S. school, home school, or non-profit youth organization.

As you think about this year's competition, remember how a team from Rockwall-Heath High School in Millersville, PA, took first place at the annual Team America Rocketry Challenge (TARC), earning the title of national champion this past Spring. The four-member team won the world's largest rocket contest after spending months designing, building, and test launching their model rocket. Additionally, they got to compete international at the 2011 Paris Airshow against national champions from France and the United Kingdom. As the reigning international champions from the Farnborough International Airshow competition in 2010, the pressure was on for team USA! Our rocketeers were up to the challenge, scoring a 5 (representing a height of 745 feet [227 meters] and a duration of 43.15 seconds [a perfect score would have been 0] to earn first place!

Your team could be the next world champion! This year teams of three to 10 students will be challenged to design and build a rocket that will climb to 800 feet with two raw eggs as the payload and stay aloft for 43 to 47 seconds. The eggs must then return to earth unbroken. The entry forms, contestant handbook, and other details about TARC 2012 are posted on [the AIA's website](#). Registration is open from September 7 until November 30, 2011. [The rules for TARC 2012 were released in July 2011](#)

The top 100 TARC teams will be invited to compete at the National Finals on May 12 competition just outside of Washington, DC. Student participants compete for \$60,000 in prizes, scholarships and a Raytheon Corporation sponsored trip to the 2012 international air show in Farnborough for an international fly-off.



NAR Instructional Video

Several years ago the NAR and Aerospace Industries Association produced a one-hour instructional video "How to Build and Fly a Model Rocket" in support of student teams in the TEAM America Rocketry Challenge student rocket contest. Originally only available in DVD format, this useful resource is now available on YouTube at <http://www.youtube.com/watch?v=qYh1pWHoQXE&feature=related>.

TIP: Planning considerations

While model rocketry offers a rich set of learning experiences, teachers should keep a few items in mind as they plan and conduct lessons.

Construction Safety

Be aware that many children have never used an X-acto knife or equivalent. It is best to hold a separate learning session on knife safety rather than during a model building session. Another alternative for untrained youth is to completely eliminate the need for a hobby knife during the build or have an adult pre-cut parts needing a hobby knife before the session begins. If you do choose to have students use hobby knives, limit the number being used at any given time and closely supervise their use.

Launch Safety

Model rocketry was created in the late 1950's as a means by which non-professional individuals could build and fly their own rocket powered models. The hobby was structured to safely pursue an activity that has a potential for personal injury and property damage. The use of manufactured motors to minimize the mixing and handling of propellants was a major factor in model rocketry's safety success. Safety

procedures for the construction and operation of the models, based on aerospace industry practices, were another factor in this excellent safety record.

The primary safety officers are the Range Safety Officer (RSO) and the safety check-in officer. The RSO is responsible for safe operation of the rocketry range. The safety check-in officer is responsible for verification of the vehicle flightworthiness. He will inspect the vehicles for structural integrity, systems condition (e.g. recovery system, motor restraint), motor certification, and dynamic properties (e.g. center of gravity, center of pressure).

[NAR Sections](#) all over the country hold numerous [sport launches](#) each year, at which you are welcome to come fly. The Section takes care of providing the permits, field, launch equipment, and range organization and safety; just bring your rockets, motors, and flight supplies and join in the fun! With sport launches accounting for over twelve million rocket flights every year nationwide, the NAR offers a number of services for the sport modeler.

Rocketry in Argentina and Brazil

Looking for an international rocketry connection for a Social Science or History class? Jason Wentworth from Fairbanks Alaska sends the following links:

[Argentina](#) and [Brazil](#). Both provide history, drawings, and images of quite a few interesting sounding rocket programs. Check it out!



NAR Scholarship Program and Robert L. Cannon Award

Did you know that if you are NAR member between the ages of 17 and 22 attending college or a vocational school that you may be eligible to receive a scholarship?

Are you a teacher or educator who uses model rocketry in the classroom? You are welcome to apply for a \$500 grant to use in your program.

In 2001, the NAR's scholarship and Robert L. Cannon educational awards were inaugurated at NARAM. Three NAR members received scholarships and two educators received Cannon award grants. For 2002, there were five Cannon awards and five scholarships presented to recipients. In 2003, there were four scholarships awarded to NAR members and three Cannon award winners. Since 2004, we have awarded 5 Cannon winners per year.

Deadlines for applying for scholarships and the Cannon award are May 1st of each year. Awards are announced at the annual meet (NARAM). You do not have to be present to receive an award.

Both of these programs are ongoing. See <http://www.nar.org/cannon.html> for details on how to apply. If you have questions concerning either program, please contact the NAR treasurer: Stew McNabb, via email: smcnabb@eastnc.twcbc.com or Joyce Guzik, via email: jguzik@mindspring.com.



Wallops Rocket Academy for Teachers and Students (WRATS)

The first WRATS High School teacher workshop was held in the new education lab in building F-7 at Wallops Flight Facility. Twenty-three educators, representing twelve states, attended the workshop and spent June 20 - 24 learning about sounding rockets, model rockets, electronics, rocket physics and aerodynamics.

The participants also visited with the college level workshop RockOn! occurring the same week, and attended the RockOn! Terrier-Orion launch on June 23rd.

The first day of the workshop started with a range entry briefing, a general overview of the sounding rockets program, and a presentation on rocket propulsion. The afternoon focused on electronics with the participants building their own electronic payloads for model rockets. The payloads recorded pressure, temperature and acceleration data.

Days two and three involved rocket physics, trajectories, and flight performance. Moments of inertia were measured using inertia bars and the educators conducted wind tunnel testing of a model rocket. Hands-on activities for these two days included building model rockets, integrating the payload and conducting launch operations. The rockets were successfully launched on the Wallops airfield. Viewing the RockOn! launch on Thursday involved an early morning wake-up time. The launch window opened at 6:00 a.m. and the rocket was launched at 06:18 ET. For most WRATS attendees, this was their first sounding rocket launch and their excitement was noticable. De-integration of the RockOn! payload occurred in the afternoon and the WRATS team saw the payload skins removed and the experiments returned to the students. Additionally, parachute construction and drops, using the crane in F-7, were conducted on Thursday. The last day of workshop, Friday, June 24th, teachers wrote evaluations of the program and also listened to presentations about NASA Explorer Schools and the AESP programs. Six participants stayed for the afternoon computer programming session.

To learn even more about WARTS, check it out at (<http://education.wff.nasa.gov/>).



National Association of Rocketry (NAR) offers Teachers and Youth Group Leaders resources

The NAR offers Free Resource downloads (<http://www.nar.org/teacher.html>) produced by members who have helped teachers and youth group leaders like yourself all over the United States.

Manufacturers

Looking for a special rocket to highlight a particular aspect of your lesson plan? Take a look at the following companies for some unusual ideas:

[Fliskits](#) offers a wide variety of kits and services...From science fiction topics to a scale model of the worlds first successful liquid fueled rocket was designed, built and flown by Robert H. Goddard Fliskits has you covered...To include an educational sections where you will find opportunities for lesson plans and discounts to educators.

Whether you are just beginning to integrate rocketry into your curriculum or have been utilizing it for years, [Semroc](#) offers something new for everyone. From their latest scale renditions of the Aerobee 150 and ARCAS to their Retro-Repro™ kits of the Moon Glo and Shrike, you are sure to find something to stimulate learning.

If you are looking for a special sport flier, military scale replicas, scale sounding rockets or even multi-stage and cluster rockets, [Rocketarium](#) is the place. You'll find a wide selection of model rockets, parts, and supplies; there's something for every lesson and every budget!



Visit the NAR booth at the NSTA Conference

The NAR will have an exhibit at the regional NSTA conference in Hartford, CT Oct 27-29, 2011. Come by to hear about the latest plans NAR has for education and see what TARC rockets look like. We'll have other cool rockets on display to show you how to launch your students experiments. Tell your colleagues who may be attending to check us out!



Quick Links...

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- [Our Website](#)
- [NAR Teacher Resources](#)
- [Find a Local Club](#)
- [Model Rocket Safety Code](#)

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