Team America Rocketry Challenge

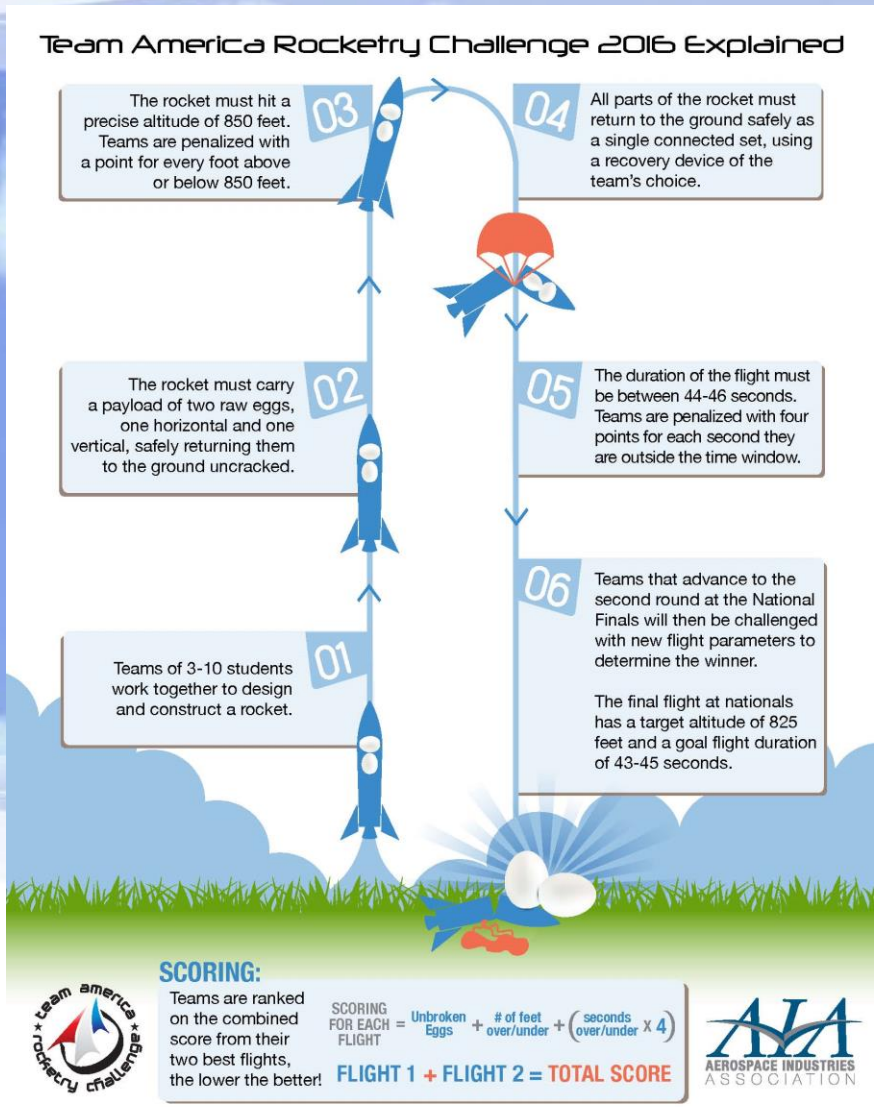
Mentoring TARC Teams

Why Mentor?

- Mentoring is a “secret sauce” that greatly improves the experience and rate of success for students, particularly first-year teams.
- Provides mentors with professional development experience and the personal reward of seeing young students succeed.
- For corporate mentors, TARC mentoring builds awareness and goodwill towards company, forges link to prospective future employees.

How does the challenge work?

- Students work in teams of three to ten
- Goal is to design a rocket that best meets challenge criteria that change each year
- Qualification flights locally, best teams attend National Finals in Virginia in May
- Winning US Team travels to Farnborough International Air Show for International Rocketry Challenge



TARC Timeline

Sept. Oct. Nov. Dec. Jan. Feb. March April May June July

Sept. 1
Registration opens

Dec. 4
Registration closes

April 4
Qualification flight scores deadline

April 8
Top 100 teams invited to National Finals

May 13-14
National Finals

July 14-15
Top team competes at Farnborough International Air Show

- Successful teams usually start work and build their first TARC rocket in the fall.
- Suggested team schedule included in the TARC Handbook.
- Most launches occur in Jan.-Mar. timeframe

Who Does Mentoring?

- Two main sources of mentors:
  - National Association of Rocketry (NAR)
    - Rocketry experts, not always familiar with aerospace industry or STEM professions
  - Aerospace Industry Mentors
    - TARC sponsor company or aerospace employees, aerospace professional society members, aerospace retirees, etc.
    - Can provide career, education, and life skills advice.
    - Not necessarily rocketry experts

How Can I Get Involved?

- NAR Mentor
  - Email Trip Baber, NAR TARC Manager, at ahbarber@alum.mit.edu with your city, state, phone number and email address. He will add you to the publically posted mentor list.
- Aerospace Industry Mentor
  - Contact your company TARC mentorship coordinator.
  - If uncertain who to contact, or if your company dos not have a coordinator, reach out to TARC at rocketcontest@aia-aerospace.org

How Do I Find Teams to Mentor?

- NAR Mentors
  - Teams may contact you using the contact information you provide to Trip.
  - Reach out to local schools in September-November each year to make them aware of the challenge, and to any local schools who registered but have not contacted you by January
- Aerospace Industry Mentors
  - Contact TARC (rocketcontest@aia-aerospace.org) for access to the list of teams looking for mentors. There may not always be teams in your area, so consider approaching local schools about starting teams.
  - Local outreach is particularly successful if your company can guarantee mentor + funding (~$500-$1000 per team).

How Much of a Commitment is TARC Mentoring?

- Aerospace Mentors
  - **Type IA (Single Session Engagement):** ~1 hour/month, one-of presentations to teams
  - **Type IB (Ongoing Career Mentoring):** ~2-3 hours per month, on-going career and educational mentoring of team, might connect team to your employer for factory tours, etc.
  - **Type II (Technical Rocketry Mentoring):** 4+ hours/month +~10-20 hours of time to develop knowledge of rocketry if not already familiar.
- NAR Mentors
  - NAR mentorship corresponds to Type II. Generally expect to work with teams once per week or so, and at periodic launches. Level of involvement varies on team need, distance, and your availability. Be up-front with teams regarding what your availability is.

Advice for Type II (Rocketry) Mentors

- Before you begin:
  - Please read the TARC Handbook and rules.
  - *PLEASE do not design any team's official entry rocket or help them in the building of it; this is intended to be a learning experience for the student team members.*
  - If you are not already familiar with rocketry, please review the following
    1. NAR "This is Rocketry": General orientation to the hobby of rocketry, to how rockets work, and to the NAR
    2. NAR Rocketry Basics: Describes the basics of rocket stability, rocket construction, and rocket motors.
    3. 6-part NAR rocketry video series : covers the basics of how to build and fly a model rocket. It can be supplemented with this series of webpages on model rocket construction.
    4. "The Process of Designing a Rocket for TARC": This is a detailed description of the way to approach mission design for TARC, written by the vendor who provides the RockSim rocket design and flight simulation software that is used by most teams.
    5. NAR Mentor and Observer Guidelines
    6. TARC "Frequently Asked Questions": A large set of common questions that TARC participants ask, with authoritative answers.

Advice for Type II Mentors
(cont')

- Encourage students to not underestimate the amount of time it takes to build and fly a TARC rocket and to anticipate weather delays, rocket losses, and other uncontrollable events.
- Encourage students to read the rules, the TARC Handbook, and the "Frequently Asked Questions" on the TARC website; and to watch the 6-part tutorial video on building and flying a model rocket on the website.
- Encourage students to act as a team, with division of labor and responsibility shared among the members, each member accountable to his or her teammates for some part of the project, and no single person doing it all.
- Be positive and encouraging when they face difficulties in construction or flight testing. TARC is not easy, that is why it is called a "challenge"! Previous winners all had failures but learned from them and persevered to final success.
- Do not do any of the design decision-making or rocket construction of their TARC entry for them; TARC is a student event
- Have fun! Rocketry is always enjoyable, and you are making a difference for the students you mentor.

Advice for Type II Mentors
(cont')

- When working with students
  - Teach students, or direct them toward resources to help them learn, basic model rocketry, especially Stine's "Handbook of Model Rocketry" (available to TARC teams for $20).
  - Advise teams on rocketry safety and help them avoid designs or actions that would be unsafe, or that would violate the NAR Model Rocket Safety Code. *Regardless of other guidelines, please intervene with advice if you see a team about to do something that is clearly unsafe.*
  - Help students secure a launch site, either through an established rocket club (the NAR or TRA), or a site arranged by the team that meets safety requirements.
  - Lend teams launching equipment, point them toward groups that already have such equipment the teams could use, or help them design and build a launch system.
  - If you are a current NAR Senior member, and not related to any team member or employed by their school, you may serve as the official NAR flight observer for teams' local qualification flights.

Perspectives from an Aerospace Company Mentor

- Jarred Green, The Boeing Company

For more information:

For information about TARC 2016, visit:

www.rocketcontest.org

For information about rocketry, visit:

www.nar.org

To contact TARC:
rocketcontest@aia-aerospace.org