

engineering challenge



The third manned lunar-landing mission, Apollo 13, was launched on April 11, 1970. Two days after the launch, the spacecraft experienced an equipment malfunction threatening the lives of the entire crew with a shortage of breathable air for the return trip to earth.

A team of NASA scientists and engineers had to develop a makeshift air-filtering device from items that were readily available on-board the space capsule and then communicate to the astronauts exactly how to construct and implement this device. What made it more dramatic was that they only had a short period of time to do it, and the lives of the astronauts depended on their resourcefulness and engineering know-how!

The Christian School Finals Competition Engineering Challenge (event #138) provides an opportunity, similar to the experience of the Apollo 13 team, to demonstrate intelligence, ingenuity and problem solving skills by discovering an innovative solution to a previously unknown problem in a limited amount of time. The challenge requires quick thinking and decisiveness, as well as a practical knowledge of science, mathematics and engineering concepts. It also helps to be able to work well with others in a high-pressure situation, synthesizing various ideas into the best overall solution. Here are a few tips for the best utilization of your team.



THE ENGINEERING CHALLENGE

By Dr. Dominic Halsmer

BUILDING THE TEAM

A Christian School Finals Competition Engineering Challenge team consists of three students. In team selection look for individuals demonstrating strengths in different areas to complement each other and fill each other's weaknesses. Desirable areas of strength are:

- Intelligence
- Knowledge of science and math
- Experience in building things
- Inventiveness
- Creativity
- Ability to apply knowledge to solve a problem

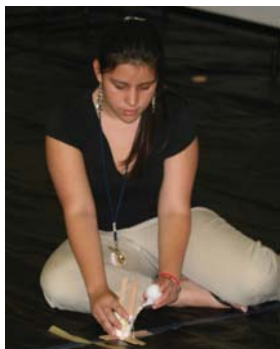
All individuals should have the necessary skills and attitude to work well on a team.

APPLYING THE SKILLS OF THE TEAM

The Engineering Challenge promotes the use of creativity, resourcefulness, innovation and use of mathematical and scientific principles in solving the challenge. To be ready for the competition, you can work on diligently applying your skills in these areas throughout the year. Your math and science teachers can help you develop these skills with hands-on projects or mystery design competitions in your classes.

At Competition the judges will look for how your team applied these specific criteria to your project. The following guidelines give some insight on how the judges will measure your project within these criteria:

- Creativity: Does your project demonstrate the ways you used your imagination to visualize how the provided materials might be combined in a creative way to solve the given problem?
- Resourcefulness: Does your project express how your team's accumulated experiences recognize the potential usefulness in each of the provided items in serving as part of the solution?
- Innovation: As a team, did you come up with a new way to use an item to serve a purpose that it may not have been originally designed to serve?
- Use of mathematical and scientific principles in solving the challenge: Does your project display these principles? For example: applying Newton's Law predicting that heavier objects roll downhill faster than lighter objects to make a faster downhill racecar.





You can practice these throughout the school year by looking for inventive ways to solve everyday problems and make life better. Have the mind of an inventor, always looking to creatively make use of any and all resources to improve a situation.

WORKING TOGETHER AS A TEAM

Teamwork is critical for success. A good solution may fall by the wayside if the team is not working properly to synthesize all the ideas that come up. Throughout the year, practice teambuilding exercises. These do not need to be technical in nature. They can be anything that requires working together in a cooperative manner (i.e. making a batch of salsa).

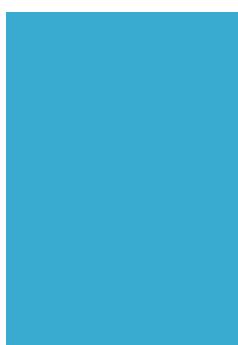
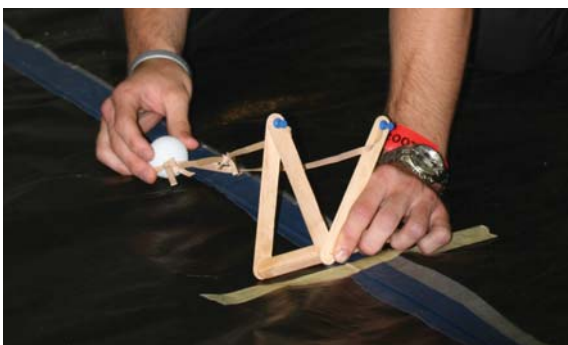
TAKING THE CHALLENGE

Are you ready to test your team? A sample challenge is posted on the CSFC Web site at <http://competition.oru.edu>. Additionally, you can find other helpful information on these Web sites: www.asme.org or www.ieee.org.

UNDERSTANDING YOUR IMPACT

The United States desperately needs more scientists and engineers to meet the technological demands of the future. Many countries of the world are growing in this regard much faster than the United States is presently. As a result, the United States' technological edge is quickly eroding. The Engineering Challenge is an exciting opportunity to see how your gifts in science and engineering can be used for the betterment of the human condition all around the world.

Bio: Dr. Dominic Halsmer is a professional engineer specializing in spacecraft attitude dynamics and control, particularly spinning, thrusting spacecraft. He presently serves as the Dean of the School of Science and Engineering at Oral Roberts University, where his research activities have involved undergraduate engineering students in the development of an apparatus to test the stability of spinning spacecraft under thrust. His current research involves a study of how the universe has been engineered to reveal the glory of God and accomplish His purposes.



CHRISTIAN SCHOOL FINALS COMPETITION DATES

Students and sponsors from El Paso, Texas to Colombia, South America will be arriving on the Oral Roberts University campus for the ORU Christian School Finals Competition the week of May 17-22, 2009. An eagerness fills the atmosphere of the Competition office as we plan and prepare for each participant.

COMPETITION HANDBOOK 2009

The 2009 Competition Handbook is available online at the Competition Web site at <http://competition.oru.edu>. The password to access the Handbook is **faith2live**.

EARLY REGISTRATION DISCOUNT

A discount of \$250 is available to all schools that fully register all Group 1 forms and submit the appropriate deposit by March 1, 2009. The \$250 discount will be deducted from the total deposit due. Final registration is due April 1, 2009.

GROUP I FORMS

Group I registration forms are to be electronically submitted online through the Competition Web site at <http://competition.oru.edu> by March 1, 2009 to be eligible for the early registration discount or April 1, 2009 for final registration. We suggest the use of an overnight carrier which provides tracking capabilities when sending in fees and event entries.

- Form A - Checklist for a Successful Registration
- Form C - Statement of Faith
- Form D - Master Registration
- Form E - T-Shirt Order
- Form M - Consent for Medical or Dental Care of a Minor
(Please submit Form M online and then make 2 copies and bring the signed copies to check-in at registration.)
- Science Project Forms (see event guidelines for more details)
- Deposit of \$75.00 per person and team fees due when submitting Group I forms (either April 1 or March 1 for early registration)

GROUP II FORMS

Group II registration forms are to be electronically submitted online through the Competition Web site at <http://competition.oru.edu> by April 15, 2009.

- Form F - Designated Person for Emergencies
- Form G - Adult Sponsor Information Form
- Forms H & I - Boys and Girls Residence Assignments
- Event entries for the following categories should be received in the Competition office by April 15, 2009:
 - Essay Writing - 115
 - Poem Writing - 120
 - Short Story - 125
 - Yearbook - 146

TRACK AND FIELD TIMES/GOLF SCORES

- Form J - Track and Field Times and Records/Golf Scores are to be submitted electronically online through the Competition Web site at <http://competition.oru.edu> by May 1, 2009.
- Runnercard software will be used to schedule the meet. Instructions to enter your athletes in track events will be given closer to the Competition date. Please note it is very important for each school to include the track and field entries on Form D as well as in the Runnercard software. This will prevent unnecessary added event fees.

ADD/DROP EVENT FEE

Schools are required to submit Form D, the Master Registration form, by April 1, 2009 or March 1, 2009 for early registration. Plans for each event are made in accordance with each school's registration. Judges and other staff are contracted as a result. Adding, dropping and/or missing events will incur an additional fee of \$10 per instance.

CONTACT US

International schools needing invitation letters to obtain Visas to attend Competition should contact the Competition office as soon as possible.

We are available to assist you with your Competition preparations. Please do not hesitate to contact us by e-mail at competition.oru.edu or by phone at 918.495.6856. We are looking forward to seeing you at the 2009 Christian School Finals Competition in May.

ORU Christian School Finals Competition
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CSFC