



THE 2018 SOUTH CAROLINA  
**4-H ENGINEERING  
CHALLENGE**

## Rocketry Challenge

### Challenge Description:

Teams will build and bring a rocket to launch with air power. The launch objective is to obtain the greatest distance with an accuracy of +/- 5 degrees left or right of center.

### Team Requirements:

- 2-4 students per team.
- Age Range: Junior (age 9-13) and Senior (age 14-19)

### Materials Needed:

Team will bring their rocket, presentation, and repair materials. (Launch tube is optional)  
The launcher will be provided at the event.

### Challenge Instructions:

Teams will be divided into two groups on the event day: Group A & Group B.  
Group A will give go to the presentation and give their presentation while Group B conducts their rocket launches. At a designated time, the groups will switch so that Group B teams can give their presentations and Group A teams can conduct their launches.

### Launching:

Each team's rocket will be inspected to ensure that it meets the rocket requirements (see Preparation Instructions section below). The launcher will be locked into a stand but teams can make adjustments to the angle and rotate the launcher left and right. All teams will make a first launch attempt and then all teams will be allowed a second launch attempt. Rockets will be flown in a parking lot, so plan for damage and have supplies to repair your rocket if needed. This year's challenge will be based on an air powered launcher.

### The Launcher:

- Volume of 50 cubic inches at a pressure of 28 PSI.
- Adjustable launch angle (Horizontal and Vertical)
- ¾ inch PVC launch tube.
- Instant dump valve. (Releases all pressure in milliseconds)
- You may bring your own launch tube with a ¾ inch PVC Female pipe thread.

### Presentations:

Each team will give a 5 minute presentation on the design of their rocket. PowerPoint or physical posters are acceptable as presentation materials. See the Preparation Instructions section below for more information about the presentation preparation.



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**Preparation Instructions:**

*Rocket Preparation:*

Build an air powered rocket based on a launch tube of  $\frac{3}{4}$  inch PVC. Rocket should slide easily over the  $\frac{3}{4}$  inch PVC pipe.

*Rocket Requirements:*

- Must be made of Paper or light plastic.
- Be under 8 ounces in weight
- Must not have lifting wings
- Must have fins for stabilization
- Must fit in a 14x6x6 volume

*Presentation Preparation:*

Create presentation on your rocket. The presentation should include pictures of your team's rocket in case it is damaged during your launch. PowerPoint or physical posters are acceptable as presentation materials. PowerPoints must to be emailed 3 days prior to the competition to [korishe@clermson.edu](mailto:korishe@clermson.edu) with your team members' names, your team's adult contact, and the adult contact's phone number and email address.

*Concepts to address in your presentation:*

- why you chose materials
- weighting of the rocket
- fin and nose design
- launch angle
- basic understanding of ballistics

**Judging:**

Launch judging will be based on the greatest distance of the two launches that stays in the +/-5 degree range. In case of a tie the closest to the center line will win.

Presentations will be judged on design aesthetics, explanation of design, and demonstration of teamwork in the presentation. Your presentation points will be added to your launch distance to come up with your final score (200 ft launch + 80 presentation points = score of 280). Max presentation score is 100

**Launch Video:**

This video is meant as a demonstration of how the launcher works. This launch was not conducted for accuracy or distance.

<https://youtu.be/qmnkIcdpHDg>



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Launcher Images:

