

Lift Off



Ever filled a soft drink bottle with water and pressurized air to experience the excitement of....whoosh...your own rocket!!

This is your chance not only to experience the adventure, but also demonstrate your innovation and intelligence. So put on your thinking caps and start preparing for Impulse, the water rocket event, because this time, it ain't going to be easy. The stakes are high and the masters will be competing. Of course, as you will come to know when you make your first water rocket...this is all about fun.

Problem Statement

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Put in all your brain cells to come up with an innovative water propelled rocket which attempts to defy the laws of gravity and remain airborne for maximum duration. This will test the **endurance** of the rocket.

Next, aim for the bull's eye and use all your knowledge of projectile motion in launching a water rocket destined to land in a given arena. This will put to test the **specific range** of the rocket.

Event Structure

Round 1 - Endurance

The water rocket can be launched from launch pad with any suitable angle as per your convenience and would be tested for maximum time of flight.

Water rockets with boosters are also allowed in this round. Multi-staging mechanism can also be implemented with or without boosters.

All such modifications are suggested in the model specifications section.

Round 2- Range

A specific range of the water rocket will be tested in this round. The rocket has to hit a provided target range marked on the ground as circle. The centre of the circle lies at a distance of 50 m from the launch point.

Judging Criteria

Points distribution for Round 1

Number of points granted is equal to the time of flight measures in seconds multiplied by 10. (= time of flight in seconds * 10).

A stopwatch will be used to measure the time of flight. The duration shall include the time when the rocket is launched and until it touches the ground in the first instance. The time for the motion of the rocket after touching the ground once is not included.

Point distribution for Round 2

The position of the rocket will be the first point of impact of the rocket on the ground at least 50 m. For every additional 2 meter, 10 points will be granted.

In event of any clash of final points a tiebreaker will be held between the concerned teams. The clashing teams will have to go through round 2 until the points differ.

The team with greater score will be awarded superior rank.

The top three teams will be granted certificates and prize money.

All decisions taken by the organizing team will be deemed as final.

Rules and Regulations

- Participants will be allowed to launch their model at most 2 times in first round out of which only 1 will be considered for the final judging. The other one will be a trial.
- In the second round 3 chances will be provided out of which 1 will be a trial. The better of these two turns will be the counted in the score.
- It is upon the participant to choose the given turn as a trial or official turn mentioning it beforehand. No points will be awarded for the trial.
- Only water and air can be used as propellants.
- Maximum pressure allowed is 4 bars.
- The team will be disqualified in case the bottle bursts while pressurizing and still mounted on the launcher.
- Participants are allowed to use separate models for round one and two but the same model has to be used throughout a given round.
- **The launch pad is provided and if the participant is willing to use his/her own launch pad, the power of allowing/disallowing the participant to do so rests with the organizing team.**

- The organizers reserve all rights to change any or all of the above rules. Changes will be highlighted on the website and will also be mailed to all the registered participants.
- Participants can bring more than one rocket.

Team Structure

A team can consist of maximum 2 members. Students from different colleges can form a team.

Eligibility

Any student of any academic institution is eligible to participate.

Model Specification

- Water Rocket and any of its components should be handmade. Readymade models are strictly not allowed.
- Your model have maximum **2 liters cold drink plastic bottle**. Images are attached.
- The water rocket may contain any of the following mechanisms suitable for different rounds :
Water Rocket with Parachute mechanism.



Water rocket with booster mechanism is prohibited.

Any other innovative mechanism will be encouraged provided that the material and mechanism used is not harmful or dangerous to any person in the field. In this case the decision of the panel of coordinators will be final and no queries will be entertained in this regard.

Some useful links are:

<http://www.aircommandrockets.com/construction.htm>

<http://www.youtube.com/watch?v=x8jrqa08Xa8&feature=related>

<http://www.youtube.com/watch?v=6db9kZh3EdU>

<http://www.youtube.com/watch?v=m2ui8ITPIU8&feature=related>

It is suggested that you should try the following link for simulations on water rockets-

<http://exploration.grc.nasa.gov/education/rocket/BottleRocket/about.htm>

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