

Pressure Rocket

➤ Event Description

Pressure Rocket is event that involves the fabrication of a rocket whose fuel/thrust for flight is obtained by the use of water that is expelled at a large air pressure. It is an example of Newton's third law of motion. The pre requisites for such an event would be a basic knowledge of fabrication, materials and physical calculations involving thrust, air pressure, etc. The event tests a couple of aspects of the Rocket's flight. These include range, time of flight and accuracy of the launching mechanism

➤ Task

Design a water rocket that is completely powered by the thrust delivered by water expelled at high pressure along with its launch pad

The event consists of two rounds. First one is qualifying, second is final round

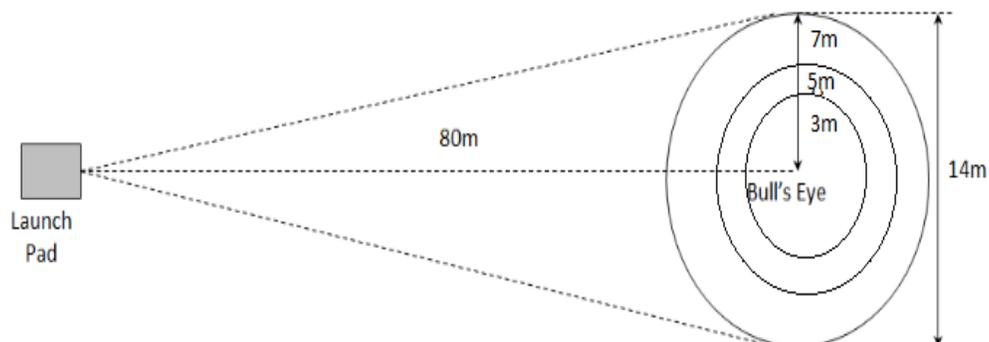
- **First round: Range test**

Here the maximum range is tested. The distance between the launch pad and the point of landing is measured and taken to be the points in that round. From this, top eight teams will be shortlisted for the next round.

- **Second round: Accuracy test**

At a distance of 80m from the launch pad, a target is placed. Target contains concentric circles of radii 3m, 5m and 7m. If the rocket lands at the Centre, team gets 100 points, second ring 75 points, and outer ring 50 points. If the contact point is touching the line it will be considered points for inner circle. If otherwise, no points are awarded. In the case of any tie, the time of flight will be noted and the team with the least time gets into the next round.

➤ Arena



➤ Event Rules

- Max 3 members per team. These Participants can be from different colleges too.
- The rocket and its components must be handmade. No readymade rocket is allowed.
- The rocket body should be made only with plastic bottles of aerated soft drinks of maximum capacity 2.5L and should be free of any fabrication failures or dents caused by heat exposure.
- More than one bottle can be used but the total volume must be less than 2.5L.
- Each team MUST have their own launch pads.
- The pressure rocket must use only compressed atmospheric air as its source of energy. Pressure compressors (foot pump) shall be provided at the venue. The pressure inside the container (rocket body) before launch should NOT exceed 60 psi for the two rounds.
- Water to be filled in the rockets will be provided by the organizers. Calculations regarding amount of water to be used is left to the choice of the team.
- Two trials will be given to each team and best of two will be taken into consideration.
- The rocket must be launched from a stationary position using a fixed launch pad. Slingshots, trebuchets, catapults, cannons, and all other devices that may assist launching are strictly prohibited. In other words, the internal pressure of the rocket must be the only source of energy for the rocket.
- Pressure rockets can have multiple stages. Parachute, gliding mechanisms are permitted.
- Use of electronic components and chemical explosives are banned.
- The point where the rocket hits the ground first will be taken as the point of landing and measurements will be taken considering this point.
- Teams are advised to get more than one water rocket, in case of any damage to one. But the water rockets must be identical.
- The participants are allowed to use variations of their water rockets in different rounds. However, only one design must be maintained throughout a single round.
- The team will be disqualified/given another chance to remodel if the model is found to be dangerous in anyway.
- Decision of the organizers is final and binding.

➤ Judging Criteria

- The judgment is completely based on the marking scheme mentioned in the event format.
- The organizers decide to permit the launching of the rocket after inspection of both the rocket and launch pad considering factors such as safety and permissible mechanisms mentioned in the rules.
- In such cases, the organizers' decision is final and binding.

➤ Provisions at Competition Site

- Water
- Water Bucket -1
- Measuring cup -1
- Pressure Compressors (foot pump) (which will have an in-built pressure gage). - 2
- Meter Scale (Circular)
- Lime Powder-5 kg
- Rope
- Canopy - 2
- Chairs - 4
- Table - 2
- Mike - 2
- Speaker -1
- Stop Watch - 1
- Branding Department (Camera)
- Hoarding -2 (Event Details)



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