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# Water Rocket War Challenge: Official Rule Book

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## 1. Introduction

Participants in the Water Rocket War Challenge create, assemble, and will launch water-rockets in a hands-on competition. The objective is to demonstrate creative design and construction methods in order to fly for the longest duration or the furthest distance. This challenge promotes creativity and practical skills in a fun and competitive setting while testing participants' knowledge of engineering, aerodynamics, and the fundamentals of rocket flight.

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## 2. Objectives of the Challenge

- Encourage innovation in rocket design using water as the propulsion method.
  - Provide students with practical experience in rocket construction and aerodynamics.
  - Promote an understanding of the physics behind rocket propulsion and flight stability.
  - Foster teamwork and problem-solving skills in building high-performing rockets.
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## 3. Competition Format

- **Stage 1: Design Submission**
    - Teams will submit a detailed design of their water rocket, including:
      - Sketches or technical drawings showing the rocket's structure.
      - A description of the materials used.
      - Explanation of the design choices for maximizing flight time or distance.
  - **Stage 2: Build and Launch**
    - Teams will build their rockets according to the submitted designs.
    - Rockets will be launched using water and air pressure as propulsion.
    - Participants will have two attempts to launch their rockets, and the best performance in terms of distance or flight time will be recorded.
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## 4. Eligibility Criteria

- Open to university and high school students.
- Teams must consist of 2-4 members.
- Participants from any academic background are welcome, with an emphasis on engineering, physics, or related fields.



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## 5. Rocket Design Guidelines

- **Material:** The rocket body must primarily be made of lightweight materials such as plastic bottles, but teams are encouraged to use wood or biodegradable materials for fins and stabilizers.
- **Propulsion:** The rockets must be powered by water and air pressure only. No other chemical or mechanical propulsion methods are allowed.
- **Launch Mechanism:** Teams may bring their own launching apparatus (e.g., pump, tube, etc.) or choose to use the one provided at the event
- **Dimensions:** The total length of the rocket should not exceed 1.5 meters.

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## 6. Submission Guidelines

- **Design Submission:**
  - Maximum of 2 pages detailing the rocket design.
  - Must include:
    - Technical drawings or sketches.
    - A description of the design elements aimed at optimizing flight performance.
    - The choice of materials and their impact on aerodynamics.
- **Flight Testing:**
  - Each team will have two chances to launch their rocket.
  - The best flight performance, either in terms of maximum distance or flight time, will be counted.
  - The minimum target point of the launch will be 20m.

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## 7. Evaluation Criteria

- **Innovation (20%):** How unique and creative is the rocket's design?
- **Engineering (20%):** The effectiveness of the design in improving flight stability and propulsion.
- **Design Presentation (20%):** The clarity and thoroughness of the design explanation in the initial submission.
- **Flight Performance (40%):** Distance covered or flight time achieved.

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## 8. Timeline

- **Design Submission Deadline:** 11<sup>th</sup> October 2024
- **Build and Launch Event:** 12<sup>th</sup>-13<sup>th</sup> October 2024
- **Award Ceremony:** 13<sup>th</sup> October 2024



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## 9. Awards and Prizes

1. **Awards:** Prizes will be awarded to the top-performing teams. Details on prizes will be announced separately.
2. **Recognition:** Winners will be featured on the event's website and may receive certificates or trophies.

All participants will receive participation certificates, and the top designs will be showcased at the event.

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## 10. Rules and Regulations

- All rockets must be constructed according to the provided guidelines.
- Only water and air pressure may be used for propulsion within the pressure range of 20-80 PSI.
- Teams must adhere to safety regulations during the launch process.
- Judges' decisions are final, and any violation of the rules will result in disqualification.

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## 11. Judging Panel

- The judging panel will consist of:
  - Those with engineering and aerodynamics backgrounds.
  - Scholars and experts from the associated field.
  - Professionals with prior engineering and design competition experience.

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## 12. Team Registration

- Teams must register through the official online registration portal.
- All team members' names, university or school affiliations, and contact details must be included in the registration form.
- A confirmation email will be sent to registered teams with further information.

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## 13. Contact Information

For any questions or additional information, please contact us at:

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