

APRSAF-18 Water Rocket Event – Rules for Launch Competition

(Version 1.4 – Updated 18 August 2011 – SpeedB Pte Ltd Singapore)

1. APRSAF-18 Water Rocket Launch Competition will be held at Saints Hilda's Secondary School (tentative), on Sunday 4th December 2011.
2. All competitors will make their water rockets at the same location.
3. All materials to make and launch water rockets, iPad rocket launcher and hand pump will be provided by the organizer. iPad launching system will be used for electronic launching of the rockets to reduce human errors and enhance safety. Pre-made materials or launchers brought in by participants will not be allowed.



4. Each competitor should make two (2) rockets. Each student will receive:
 - a. Six (6) 1.5 litre PET bottles
 - b. Plastic sheet
 - c. Card
 - d. Tape
 - e. Scissors
 - f. Penknife
 - g. Ruler
 - h. Two (2) Orange nose cone
 - i. Two (2) Nozzles
 - j. **Plasticine**

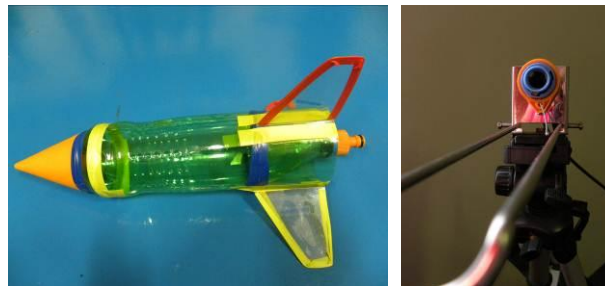
5. The competitors are encouraged to be creative in the design of the fins of their water rockets. **Nose cones are given.** Demonstration launches for students will be on 3rd Dec 2011.

The nose cone dimension is as followed:

Diameter: 8.2cm Height: 11cm Weight: 32g (3mm thickness)

Material: Hi-grade Plastic-Rubber Hybrid (Customizable - easily cut using scissors to reduce weight or size)

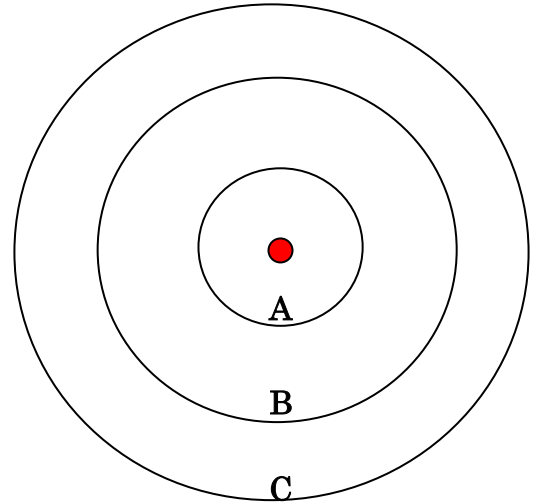
6. Each competitor will be given two (2) nose cones and two (2) nozzles as shown.



7. The launch aims at precision flight of the rocket. A target will be placed with the centre 60m from the launcher.
8. The distance will be measured from the centre to the point of impact. The rocket that lands closest to the target centre get the best score (See diagram below).
9. At the time of launch, each competitor may adjust the volume of water, air pressure, launch angle and launch direction. Launch angle can be measured using the iPads with “Clinometer” app which will be made available at the launching point (provided by the organizer). There is no limit on water volume but air pressure must not exceed 75psi (5 bar: **no red zone**).

10. Each competitor will be given an opportunity to conduct a few test launches prior to the competition.

Accuracy testing: Zone A : 100 points (within 2m)
Zone B : 80 points (within 6m)
Zone C : 50 points (within 12m)



11. During the competition, each competitor will be given opportunities to conduct two (2) launches. The result of both launches will be added together. Exact distance from the point of impact and the centre of target will be measured for rockets landing in Zone A and B.

12. There will be three (3) launchers, and the competitor will launch one (1) rocket at a time. The other 2 competitors can prepare their rockets and wait for their turns. The organizer will provide the launchers for the competitors for each of their launches.

13. In order to reduce the possibility of error. The competitors will draw lots of their launching sequence and assigned with the respective launchers. In this way, they can practise with the assigned launchers during the trial launching.

14. The competitor who achieves the highest score, **i.e. the total score of the 2 launches as stated in item 11**, after two (2) launches will be declared the winner of the Launch Competition.

15. If more than one (1) competitor achieves the highest score, **the best (closest) distance to the centre declare the winner.**

Simulation

	Student 1	Student 2	Student 3
1st launch	Zone A (100pts) 1.6m	Zone B (80pts) 2.5m	Zone A (100pts) 1.1m
2nd launch	Zone A (100pts) 1.0m	Zone A (100pts) 0.8m	Zone A (100pts) 1.9m
Total points	200	180	200
The best distance	1.0m	N/A	1.1m

Highest score: Student 1 and Student 3

The best dist. (The 1st Prize Winner) Student 1