

Model Solar Boat Challenge 2011

Event Rules and Specifications - 2011

1. State Competition

The State event will only have one category for competing: Junior Division. This will be consistent with the recent changes to the national competition of one Junior Division (aged 13 years and under) and one Senior Division (aged over 13 years).

- Students wishing to participate in the State competition must be under 13 years of age as at October 1, 2010.
- All students competing must be enrolled at a school at the time of the event, or being officially home schooled.
- All schools are eligible to enter up to and including two boats, unless otherwise advised by the organisers.
- Each team will be expected to be comprised of one boat and at least two students (desirable for starting and catching the boat).

2. Prizes

- The emphasis for the event is on participation and learning.
- Trophies and prizes will be awarded for the fastest four boats as decided at the completion of the finals races.
- The organisers, scrutineers and guest judges will awarded prizes for:
 - Best poster
 - Best new school
 - Best team effort
 - Best looking boat

3. Students must do the work

- Students are to design and construct the boats themselves, though some adult help to improve students' skills is acceptable. All students must sign a form indicating that the design and construction was their own work. Students will be interviewed about the design and construction of their boat.
- High-level technical work/ modifications (routing, welding, moulding, encapsulation, spray painting, etc) are discouraged, as students will not normally have access to these skills.
- All adjustments to the boats and the launching and retrieval of boats, are to be done by the students themselves and not by adults. If special circumstances require adults to intervene, permission must be sought from the event organiser.
- Boats as presented at scrutineering immediately prior to the commencement of racing must be used for all races. Allowable modifications to the boats between races specifically exclude the changing of solar panels and boat hulls irrespective of the light conditions. Changing propellers, gears, motors, steering mechanisms and panel voltage will be permitted between races.
- All entries will be required to present a laminated or contact coated A2 Poster (size 420mm x 594mm and may be two A3 posters taped together), documenting the design and development of their boat, to the organisers prior to scrutineering.
- This poster will become the property of the organisers and may be used for promotion of the event, but can be returned upon request.

- The poster will be assessed and marked as follows:

Item Marks	
Headings: Readable from 5 metres	1 Mark
Writing: Readable from 2 metres	1 Mark
Summary of test results	5 Marks
Construction details	5 marks
Presentation: Photos, drawings, diagrams	4 Marks
Greenhouse relevance	3 Marks
References, acknowledgements	1 Mark
TOTAL	20 MARKS

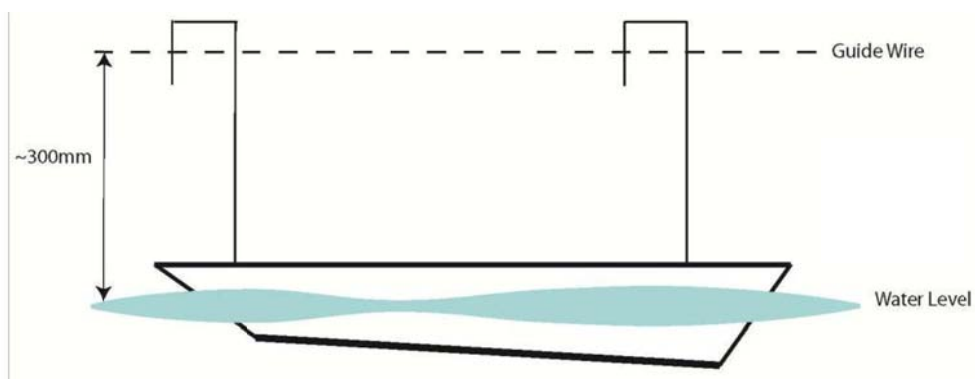
- Students are expected to be capable of operating independently of teacher/parent support and hence only students are to conduct boat adjustments and maintenance on race day. Once boats are racing, adults are not permitted into the pit area unless authorised and accompanied by event staff.

4. Boat Size

- The maximum size of all boats competing, including any front or rear projections, is 550mm long by 300mm wide.
- The boat may be as narrow as desired. (It is suggested, for the national competition, that the front of the boat does not end with a point, as this may become caught in starting equipment if it is used.)

5. Guides

- To ensure that all boats steer in a straight line, they must be fitted with two guides - one at each end of the boat - that can be looped over a nylon guide wire.
- The guide wire will be stretched, as near as possible, to 300mm above the water. (See diagram below.)
- The guide wire must not be used to propel the boat.



6. Solar cells

- The boat is to be powered by solar cell(s), up to a maximum active photovoltaic cell(s) area of 350cm²
- Teams must provide calculations used to confirm the area of solar cells. The outer edges of cells, which do not produce electricity, need not be included in calculations.
- Solar panels must be of a predominantly silicon-based material and must be available for general purchase by the public. Rare and difficult to obtain types of panels (such as used in research or satellites) will not be accepted.
- Teams must supply evidence of the source of the panel. (See point 12, Costs, below.)

- No storage devices, capacitors or batteries can be used.
- Panels must be securely attached, so that they cannot fall off in the water. Make sure that the solar cells are durable and waterproof.
- All wiring on the solar panels must be visible to the scrutineers.
- All teams should provide a suitable cover that will completely shade the active area of their solar cells - for use at the starting position.
- A team may share a panel(s) with another team between races. (That is, only two boats can share a panel.) If two boats sharing a panel are required to race each other (eg. in finals), an alternative panel must be supplied by one of the teams concerned.

7. Switch

- A switch must be installed between the motor and the solar panels to allow the engine to be turned off easily. The switch may consist of a plug or clip that is removed.

8. Motors

- Teams may use only one motor costing less than \$20 (ex GST)
- Teams must provide evidence (such as a receipt) that the purchase was from an Australian supplier.
- All Junior section motors will be accounted for at the new price of the motor, not at a reduced second-hand price.

9. Propulsion

- One plastic propeller underwater of 40mm or less or one propeller in the air only is to be used. An exception will exist if students make their own propeller, in which case no restrictions on material or size apply.
- There is no size restriction on paddle wheels, oars, air propellers etc., but the whole boat must not exceed the overall size of 300mm X 550mm.

10. Hulls

- No commercially built hulls may be used. Composite(s), vacuum or blow moulded hulls may not be used by Junior division students.
- Entrants from the same school may not have identical hulls (eg. made in the same mould), except where other substantial differences in at least two of the following are incorporated: different cabins, motors, panel attachment, panel output or propellers.
- Hulls should not be resubmitted for competition if they have competed in a prior event unless significant and substantial modification has occurred and such modifications are well documented and have the prior approval of the event coordinator.
- Each boat must have its school name and the boat's name shown clearly on the boat in letters at least 10mm high and visible when racing. These can be attached to any part of the boat as long as they do not interfere with the official labels.

11. Starting (releasing) the boat

- Teams are advised that a paper tag bearing the number of the boat will be affixed onto the rear guide post of each boat. (This will be supplied at scrutineering.) At the discretion of the race organiser, this will be the point gripped by students as the boats are released. The tags will be placed to minimise the shadowing of the solar panel.
- Students will be responsible for setting their boats into the starting position with the guides attached to the guide wire.
- Once boats are in position, the starting gate will be released by event staff.
- If the starting gate interferes with the boat performance, the organisers will rule it a false start and the boats will be re-raced as soon as possible.
- A false start can only be called before both boats have completed the race. Once both boats have crossed the finish line, the result will stand.

- If a boat comes off the guide wire because it was incorrectly positioned, this is not considered a false start.
- The boat lane will be decided by a coin toss in all occasions, except best of three where the second race will be in the reverse lanes. If a third race is required, this will again be decided by a coin toss.

12. Costs

- A summary of all costs involved in the construction of the boat, with receipts, must be submitted with the team poster.
- The cost for the whole boat is restricted to no more \$50 each (not including the solar panel)
- Recycled materials may be declared at 'no cost' if this is relevant.

13. Filming and photography

SEA will be taking video footage and photography during the competition. These images will be used for promotional purposes only. Participants (with consent of legal guardians) will be asked to sign a waiver upon registration.

14. Format

- Round 1: Time trials
 - Each boat will have three time trials with their best time recorded
 - These times will then be used to 'seed' the boats
 - The top 32 boats will continue into the next round
- Round 2: Round robin
 - Boats will be split into eight groups of four with all boats racing each other within the group (each boat races three times in this round)
 - The top two boats will continue into the next round, the bottom two boats will be eliminated
 - Each group will complete all their races before the next group commences
 - Where a tie occurs, there will be a race off held immediately
- Round 3: Eliminations
 - Each boat will compete against one other boat in a best of three
 - All boats will have their first race before the second round of racing commences
 - The winning boat will continue to the next round, the losing boat will be eliminated
- Round 4: Quarter finals
 - This will be held as a best of three.
- Round 5: Semi finals
 - This will be held as a best of three.
- Round 6: Grand final
 - The losing boats from the semi-final will compete in a best of three for third place.
 - All three races of this round will be completed before the Grand Final race commences.
 - Time and weather permitting, the Grand Final will be held as a best of five. The organisers will advise before the Semi-finals if this will be reduced to a best of three.