

# CPEP Project Guidelines

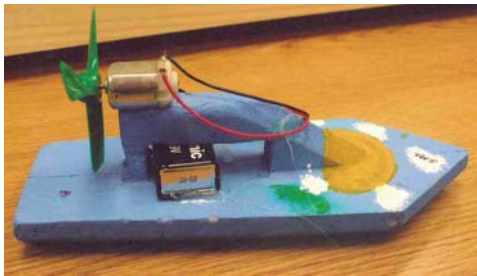
## BATTERY POWERED BOATS

### Core Outcomes -

Students will demonstrate/define/illustrate the following: concepts of buoyancy, velocity, density and displacement, Archimedes' Principle and Newton's Third Law of Physics.

### Challenge:

Using prefabricated CPEP kits, students are challenged to design, construct, evaluate, test and enter a battery powered boat in the CPEP Day competition.



### Rules: Each student team

will construct a boat using the kits provided by CPEP.

Each kit will contain the following:

- OFFICIAL 9-volt battery – this is the battery that must be used at CPEP Day
- Test battery to use prior to the actual CPEP Day competition
- Electric motor and the appropriate wires
- Styrofoam hull blank and propeller – students cannot make any substitutions with the propellers.
- Teachers will be supplied with (2) test batteries for classroom testing.



### Boat Design

Boats may be constructed using any Styrofoam hull design. However, hull designs must conform to the following standards:

- No more than 4" (10.2cm) in overall width
- No more than 8.5" (21.6cm) in overall length
- Must be designed to race in a 4.5" (11.4cm) wide by 10' (3m) long vinyl track.

All boats must be evaluated, modified, and tested prior to the CPEP Day competition.

### Judging & Scoring:

The official tracks for this event are 10 feet long and approximately 4.5 inches wide (inside dimension).

One member from the team will bring the boat to the track, place the boat in the water and hold the boat in place until the start signal is given. False starts and shoving the boat forward will result in time penalties. Each

team will be provided two time trials per boat (the fastest of the two trials will be recorded). General boat repair can be made between the two time trials.



*In addition, an award will be given for a boat with the same hull design specifications as previously mentioned that incorporates environmentally sensitive materials, such as wood, as opposed to the Styrofoam that is currently used in the models.*