Resources to get classes building.

Some of your materials could be second hand (clean, or course), such as

- Soft drink bottles
- Milk cartons,
- Coroflute plastic sheet
- Foam plastic trays
- Soft drink cans

You can purchase solar panels and motors from electronic dealers (Jaycar, & the Technology Education Centre www.tecc.cc) and sometimes from cheap importers of toys and solar battery chargers. Carefully selected propellers, solar panels, Balsa, Coroflute and motors can also be purchased from the Technology Education Centre.

An exotic and fast airscrew, solar powered catamaran using 4 propellers and twin foam hulls. This model far exceeds the aims of this competition.

Connecting Solar Panel in series or parallel.

Helping students make successful working models.

Full details of the Model Solar Boat competition,
Design & Technology Teachers Association
Datta website
http://www.datta.sa.edu.au
Installing the motor and propellers

The most efficient propellers are the professional ones which are attached to a shaft which in turn fits into a hollow tube, passing through the hull to the motor.

Keep the shaft and propeller as level with the water as possible. The motor needs to be near the bottom of the boat, usually towards the front of boat, with the propeller at the rear. Keep the motor and its shaft in line, and ensure no friction (rubbing) acts on the shaft.

If you are making a propeller, you will need to run the shaft, eg. a piece of wire or a skewer, through a drinking straw to a height above the water level, so water cannot come inside. If you are using a two hull design, this is not usually a problem.

The solar panels

Photo-voltaic cells turn sunlight into a small amount of electric power. On dull days, less power is made. Ideally, power available is matched to the needs of the motor (generally only 1.5 or 3 volts)

Link in parallel (along side each other) or in series (straight through, red wire to black each time), depending on the motor you have, and the conditions (cloudy or bright). Series gives more voltage. If you have a 4-6 volt motor, parallel gives less voltage but more amps. Make sure there are no shadows cast on the cells by parts of the boat's structure. Have the sun shine flat onto the cells.

Materials to use
Afoil, thin aluminium sheet, waxed card and paper, wood, spray foam used for gap filling, very soft foam, PET drink bottles, paper and PVA glue (if later waterproofed).

Joining methods – punched holes with tightly fitting joints, stapling, sewing, strapping, electrical ties, piercing with pointed skewers, tying with wire or use pipe cleaners.

Adhesives – glue gun, araldite, contact adhesive, plastic glues, taping (including two sided tape, and duct tape).

Joining shafts to motors – thin very flexible tubing, medical tube and fly-wire tube.

Keeping the hull dry—Cover the open areas, lubricate the propeller shaft with oil or graphite. Ensure propeller shaft is a close fit in its 'bearing', or if a loose fit, the tube it turns in is long enough to reach above water level. Water in the hull is heavy and the boat is slowed.

Tips for having a fast hull

Materials
The easiest materials to use are soft drink bottles or other found items. These can be joined with punched holes and skewers, stapling or tying.

Also consider using solid materials such as Styrofoam or Balsa wood that you can easily cut and shape. Any surfaces can be lightly covered with lightweight wall filler then sanded smooth and painted. (Wear a dust mask and safety glasses.)

For that special project, make the hulls hollow, like a real boat, with an internal frame and a thin skin. The easiest material is balsa wood, glued over cross frames of the desired shape ('bulkheads'). You may need only one bulkhead in the middle of the boat, and one at the rear, if you join the sides at a point.

Another material that gives a great outer skin is thin plastic ('shrink wrap'), and this can even be used over a wooden or cardboard hull. It needs to be securely fastened all around the top, for instance with two sided tape, and can then be 'shrunk' tight by applying heat using a hair dryer. Be careful though, as the plastic is very powerful, and can break any weak framing it is attached to as it shrinks.