

1. **DESCRIPTION:** Teams will build a blade assembly that consists of any kind of propeller/pinwheel/rotor attached to a compact disc (CD), which will be used to capture wind power and generate voltage. Students will also be tested on their knowledge regarding alternative energy.

A TEAM OF UP TO 2 EYE PROTECTION: #2 IMPOUND: Yes **APPROX. TIME:** 50 minutes
(See Eye Protection #2 on www.soinc.org)

2. **EVENT PARAMETERS:**

- All reference materials to be used during Part II of the competition must be secured in a 3-ring binder, must be 3-hole punched and inserted in the binder so that regardless of orientation none can fall out. Materials such as pencils, pens, protractors, rulers, nonprogrammable calculators, and any other similar tools may also be used during the set up and activity.
- Blade assemblies must be placed in a box (assemblies and box must be labeled with the team #) and must be impounded.
- Team members must bring and wear Safety Spectacles with Side Shields during Part I of the event, but they need not be impounded.
- The supervisor will provide a 20" multispeed box fan to be used as the wind source for testing the rotor blades and all testing materials, which will be the same for all teams, including: the fan(s), ring or similar stand (which allows for vertical and horizontal adjustments of the blade assembly), a clamp(s) (to allow teams to orient the mount to any angle with reference to the fan), a motor/generator (a portable CD player motor will be used at Nationals), and a voltmeter, probe or multi-meter to record voltage. Consult www.soinc.org for a sample setup. Other motors/generators may be adapted for CD attachment to record voltage.

3. **CONSTRUCTION:**

- Each team may bring one pre-constructed blade assembly attached to a standard CD in the C Division or up to two pre-constructed blade assemblies in the B Division.
- The CD must fit on the mount found in a standard CD player. Modification of the CD (except for the center hole) is allowed. When mounted, the blade assembly must have a maximum diameter between 20.0 and 24.0 cm for B Division and 25.0 and 28.0 cm for C Division. The blade assembly may be made of any nonmetallic substance. Commercial blades (modified or unmodified) are not permitted.

4. **THE COMPETITION:**

Part I:

- There will be two stations in the B Division (one high speed and one low speed) to test the blade assemblies and one multispeed fan in the C Division to test both speeds.
- The fan(s) must be mounted in a fixed position with the bottom of the grill at least 15 cm above the table.
- The blade assembly can be oriented and placed in any position or angle in front of the fan. The teams must mount their blade assemblies to the motor/generator and position / orient them in front of the fan prior to the fan starting. Students in B Division may use either blade assembly in front of either fan. In both divisions once mounted, blades may not be modified or switched except between runs.
- When the students are ready, they will tell the event supervisor who will then start the fan, start the time and begin recording the highest voltage during a one-minute time period. Voltage will be recorded in millivolts (mV).
- Teams in B Division must set up and complete the blade assembly testing within a 5 minute period at each fan. C Division teams must complete set up and both high and low speed testing in 5 minutes.
- The teams may give their blade assembly a single tap to start it spinning once the fan is turned on.