

Solar Collection - Technical Merit		
	Max Score	Score
Solar panel adjustable left to right	5	
Solar panel adjustable front to back	5	
Enhanced energy collection (ie: reflectors)	5	
How solidly is solar panel connected to car?	5	
How precisely can solar panel be adjusted and hold a set position?	5	
Can student quickly describe how to set panel for maximum energy gain?	5	
Judges discretionary bonus points	5	
TOTAL	35	

Solar Collection - Technical Merit

Purpose – captures solar power, turns it into electrical power and delivers it to the motor.

Methods – solar panels are made of two sandwiched layers of semiconductor materials, which can produce an electrical current when lit by sunlight and attached through a closed circuit to an external load (motor).

Concepts - angle of incidence of light, power = voltage x current, excitement of electrons, lower and higher states of energy.

The power available from the sun is affected by the angle of the sun's rays when they strike the solar panel. When the rays that reach the solar panel are perpendicular to the face of the panel the angle of incidence is considered to be zero and the power potential will be at a maximum. As the rays' angle of the incidence increases the power potential decreases since fewer rays strike the panel. When the sun strikes a photovoltaic cell it causes electrons to jump to higher energy states. The more direct and intense the incident sunlight is the more electrons it can cause to jump, or the more current it can cause to flow. More current flow results in more power.

Scoring Items

1. Solar panel adjustable left to right – panel can be adjusted to improve the angle of incidence Adjustable Left to Right.

Example Score 1 ... Does not adjust.

Score 5 ... Adjusts easily and quickly without tools.

2. Solar panel adjustable front to back - panel can be adjusted to improve the angle of incidence.

3. Enhanced energy collection (reflectors) – methods to get more rays to strike the panel, which raises the potential to generate more power.

4. How solidly is solar panel connected to car? – How well the panel stays on.

Example Score 1 ... Looks like may fall off at any time.

Score 5 ... Solidly attached.

5. How precisely can solar panel be adjusted and hold a set position? – The panel should not flop out of adjustment How precisely can panel be adjusted?

Example Score 1 ... No adjustment.

Score 5 ... Adjusts easily in small increment and holds solid.

6. Can student quickly describe how to set panel for maximum energy gain?

7. Judges discretionary bonus points.