

# JUDGING GUIDE: QUALIFICATIONS

## Materials List and Specs

REQUIRED MATERIALS	PROHIBITED MATERIALS/PRACTICES
<ul style="list-style-type: none"> <li>• Provided Motor (see appropriate motor for ES/MS or HS)</li> <li>• Provided PV Module – Pitsco Ray Catcher 2.76V module</li> <li>• Switch (any that is safe – not provided)</li> <li>• Battery holder</li> <li>• 2 AA Batteries</li> <li>• Provided resistor – <math>6.2 \Omega</math> (*HS only)</li> <li>• 1 red LED (*MS and HS only)</li> </ul>	<ul style="list-style-type: none"> <li>• Any vehicle deemed unsafe by any judge (Note: utilities are experts in electrical safety!)</li> <li>• Additional power sources beyond what’s included (required)</li> <li>• Modifying power sources (solar panel and batteries)</li> <li>• Tampering with motor (re-wound or disassembled)</li> <li>• Additional purchased materials beyond \$10 in cost (receipts for purchased materials must be included in documentation of design in notebooks)</li> </ul>

IN THE KIT – ES	IN THE KIT – MS
<ul style="list-style-type: none"> <li>• 1 PV Module (Pitsco Ray Catcher Solar Module, 2.76V, 1A)</li> <li>• 1 small DC motor (Pitsco Motor 280)</li> <li>• 1 2-AA battery holder</li> <li>• 2 rechargeable AA batteries</li> <li>• 2 metal axles</li> <li>• 4 rubber bands (2 thick, 2 thin)</li> <li>• 8 gears (2 mm hole)</li> <li>• 8 gears (1/8” hole)</li> <li>• 4 nylon spacers</li> <li>• 4 wheels (2 large, 2 small)</li> <li>• 2 balsa wood sheets</li> <li>• 1 solar panel blank (cardstock)</li> <li>• 12 pack mini alligator clip leads</li> <li>• 2 small metal alligator clips</li> <li>• 2 screw eyes</li> </ul>	<ul style="list-style-type: none"> <li>• 1 PV Module (Pitsco Ray Catcher Solar Module, 2.76V, 1A)</li> <li>• 1 small DC motor (Pitsco Motor 280)</li> <li>• 1 2-AA battery holder</li> <li>• 2 rechargeable AA batteries</li> <li>• 2 metal axles</li> <li>• 4 rubber bands (2 thick, 2 thin)</li> <li>• 8 gears (2 mm hole)</li> <li>• 8 gears (1/8” hole)</li> <li>• 4 nylon spacers</li> <li>• 4 wheels (2 large, 2 small)</li> <li>• 2 balsa wood sheets</li> <li>• 1 solar panel blank (cardstock)</li> <li>• 12 pack mini alligator clip leads</li> <li>• 2 small metal alligator clips</li> <li>• 2 screw eyes</li> <li>• <b>3 red LEDs</b></li> </ul>

## VEHICLE SPECIFICATIONS FOR QUALIFICATION

- Vehicle size: maximum length of 38 cm, width of 30 cm, and height of 30 cm.
- The solar panel cannot be used as the body of the vehicle.
- The solar panel cannot be altered (e.g. drilled, sanded, or cut).
- Vehicles must be powered by 2 AA batteries provided during the day of the challenge. The batteries must be connected to a working switch that can be turned off. The solar panel is not required to be connected to the on/off switch.
- There must be an available 5 cm square of free space for team number sticker.
- Middle school and high school teams must include a minimum of one red LED in their design that lights up when vehicle is running.