

Wheel and Guidance Systems - Technical Merit		
	Max Score	Score
Drive wheel tread appropriate for track surface	5	
Non-drive wheel tread appropriate for track surface	5	
Presence of bearings	5	
Left/Right symmetry	5	
Vehicle resistance to "Crabbing"	5	
Guidance system is adequate with minimum friction	5	
Judges discretionary bonus points	5	
TOTAL	35	

### Wheel and Guidance Systems - Technical Merit

**Purpose** – system provides means for putting the car in motion in an intended direction and supports the vehicle and payload.

**Methods** – model car wheels come in a variety of sizes (large or small diameter, narrow or wide) and various materials (rubber, plastic, wood, metal).

**Concepts** – friction, lubrication, weight distribution, tire traction, bearings, wheel alignment.

Wheel systems rely on use of two opposing concepts, friction and lubrication, to be effective. Friction or traction is necessary at the point of contact between car tires and the road. Friction allows the tires to grip the road and push the car forward. Lubrication or slipping is necessary between moving system components such as axles and bearings. This slipping allows the wheels to be turned with minimal loss of power or resistance to the forward motion.

The model solar car guidance system consists of “hooking” the car to a line stretched from one end of the track to the other, and depends on proper fore and aft alignment of the wheels to stay on a straight course.

#### Scoring Items

1. Drive wheel tread appropriate for track surface – a rubber tread usually works well on a smooth slippery surface, a lower friction material may be lighter and possibly better on a gritty surface.
2. Non-drive wheel tread appropriate for track surface – The tread should be adequate to hold the road, but not too heavy.
3. Presence of bearings – strategic placement of bearings can help optimize performance. Presence of Bearings.  
*Example* Score 1 ... No bearings, wheels very sloppy or don't turn easily.  
Score 5 ... Smooth turning, no shake any direction, feels like precision ball bearings.
4. Left/Right symmetry – space between wheels and car is same on left and right sides (space in front and back not necessarily the same), or distance of wheels from car centerline is balanced.
5. Vehicle resistance to "Crabbing" – car resists tracking sideways  
*Example* Score 1 ... Obviously does not roll in straight line.  
Score 5 ... Probably does not need line to keep it going straight.
6. Guidance system is adequate with minimum friction – hooks can be easily attached or detached from guide line and will not bind while traveling down the track. Guidance System (The hook that attaches the car to the line)  
*Example* Score 1... Does this thing really work!  
Score 5 ... Simple, smooth, clean, easy to use.
7. Judges discretionary bonus points.