Vehicles designed for racing take engineering to the limit. They are designed with one primary goal in mind: the highest controlled acceleration possible. At the simplest level, performance can be increased by increasing the power to weight ratio of the vehicle. The more power with less weight results in the potential for greater acceleration. How one uses this power then dictates the final performance of the vehicle (i.e., gear ratios, power distribution, etc.). One must consider that the ability of the vehicle to accelerate is dependent directly on the amount of torque that is transferred to the driving wheels. However, for any given gearing ratio, too much torque will deplete top end speed (since there is limited power).

**Objective**
The purpose of this contest is to construct a racer that is internally powered by a rubber band. The team with the racer that runs the straight 15 foot track in the shortest amount of time while being consistent will win.

**Rules**
1. Teams will consist of 3-4 members.
2. Each team can build up to 2 racers in the event that their first racer is damaged during a run.
3. The cost of each racer cannot exceed $20.00.
4. Racers must be solely powered by rubber bands inside the vehicle (i.e., there can be no external mechanism around the vehicle to aid in propulsion).
5. Any other power sources other than rubber bands are prohibited (i.e., no motors, compressed air, etc.).
6. Any type of rubber band can be used.
7. Racers must fit in a 12 inch cube.

**Contest**
1. The track that will be used is straight and 15 feet in length. The track surface is cement.
2. There will be two events, each consisting of three runs down the track.
3. Prior to running the events, each team will have an opportunity to make two practice runs down the track.
4. The first event is an exhibition style race. Every team’s racer will individually make three runs down the track.
5. The elapsed time for a run is the amount of time that passed from the time the coordinator says “go” to the time the racer crosses the 15 ft line. Each run will be timed by four timers. The event time is the sum of the three elapsed times.
6. The second event is the bracket style race. Every team will give an estimated elapsed time, called a dial-in, just before making a run. The objective is to make the elapsed time of the run as close to this dial-in as possible without running faster.
7. If the racer runs faster than the dial-in, it is called breaking out, and the team will receive a 1.5 second penalty. The time for each run will be determined by taking the difference between the dial-in time and the actual elapsed time. The event time is the sum of the three differences.
8. The total time for each team will be the sum of the two event times. The team with the smallest total time will be the winner.

(If you have any questions, please send an e-mail to expo@wilki.eng.hawaii.edu)