

EVENT 3: ZERO IMPACT VEHICLE

(rev 11/3/22)

OBJECTIVE: To design a vehicle which, when released eight meters from a wall, will move, then stop as close as possible to the wall without touching it.

RULES:

1. The starting line will be located 8 meters from the wall.
2. The vehicle is to be designed and built by the team from household materials and/or materials available from hardware stores and/or from art/hobby supply stores. No commercial kit may be used.
3. The design of the vehicle must meet the following specifications:
 - a. The total mass of the vehicle system may not exceed 2.0 kg.
 - b. No dimension of the vehicle may exceed 1.0 meter.
 - c. No part of the vehicle or its operating system may be attached to the floor, wall, ceiling, or operator.
 - d. The vehicle must be self-propelled. The motion of the vehicle must be supplied by mechanical means such as rubber bands, springs, weights, pulleys. No ramps may be used. No electrical components of any kind may be used, no remote controlled devices of any kind, and no chemical or nuclear reactions.
 - e. Check all parts (moving or stationary on the vehicle) for safety. (see announcement page "General Rules and Scoring").

COMPETITION:

4. The judge will record the mass of the vehicle.
5. The vehicle will be started at or behind a starting line of masking tape on the floor 8.0 meters from a wall. It will proceed toward the wall and stop as close to the wall as possible, without any part of the vehicle touching the wall. It may not bounce off the wall.
6. No practice runs will be allowed at the competition site.
7. Each team will be allowed two trials and the better one of the two will be used for the team's score.
8. Between trials, the team will have up to 5 minutes to modify their vehicle.
9. The distance from the wall to the part of the vehicle nearest the wall will be measured for the purpose of calculating the score.
10. If both trials result in touching the wall, the vehicle will be disqualified.

SCORING:

The Team's Final Score (out of 100) for a vehicle that doesn't hit the wall will be calculated as follows:

$$\text{Team Final Score} = \frac{\text{Distance of winning vehicle, cm}}{\text{Distance of the team vehicle, cm}} \times 100$$

Tiebreaker for top scores: Lowest mass vehicle system will win the tie.

Disqualification Score: If a participating team builds a vehicle according to the rules but it fails to meet the objective as specified in the rules above, a minimum Disqualifying Score (greater than zero) will be applied by the judges.

Failure to follow Rules: If a team violates the rules, they may be assigned a Disqualification Score of "zero", at the discretion of the judges.

*It is the team's responsibility to periodically check in or inquire about changes and clarifications to the rules.
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