

EVENT 3: AIR POWERED RACER

(revised 10/01/2023, revisions in blue)

OBJECTIVE: To design and construct an air powered vehicle that will race through a fixed linear distance in the shortest period of time.

RULES:

1. The propulsion for the air- powered vehicle is to be provided by the motion of air only. The movement of the air must be produced by a mechanical component that is part of the vehicle. Jet propulsion via carbon dioxide cartridges or balloons or devices that release air/gas from within the vehicle are not permitted.
2. The energy that runs the mechanical device that will produce the motion of air is to be provided only by elastic materials and/or mouse traps (no rat traps!).
3. At all times the device should not exceed the dimensions of 45 cm by 30 cm by 25 cm. (these are the typical dimensions of the boxes in which 8.5 in by 11.0 inch reams of paper are sent to schools)
4. The vehicle must travel a minimum distance of 10.0 meters from being released. **The vehicle must remain in contact with the ground during the entire 10 meters of the track. No part of the vehicle should detach from the vehicle during the run or when being released.**
5. The testing track will be 2.0 meters wide and will be laid out on vinyl tile, polished concrete or a similar flooring in the High School cafeteria or hallway.
6. The vehicle must be constructed entirely by the entrants from household materials or materials available from hardware stores or art supply stores.

COMPETITION AND SCORING:

7. The time it takes the vehicle to travel a distance of 10.0 meters will be measured with a stopwatch.
 - a. The front of the vehicle will be placed at the starting line.
 - b. Timing ends when the front of the vehicle passes the finish line.
8. Each team will have two consecutive trials and the better of the two will be used as the team's score.
9. The winning vehicle will be the one that travels the 10.0 meter course in the shortest amount of time.

Scoring:

$$\text{Your Team's Final Score} = \frac{\text{Winning Team's Time}}{\text{Your Team's Time}} \times 100$$

Tiebreaker (1st place ties only) : Teams that are tied for 1st place will re-run the course to break the tie. The original times for each team will be kept, and 5% will be subtracted from the winning team's original time. This adjusted time will become the new "winning team's time" in the scoring formula above.

Disqualification Score: A minimum non-zero score may be applied to participating teams, according to judges' decisions about disqualification.