Aero Car 2012

Objective: To construct a car that can travel the greatest distance using wind power.
Grades 5 - 9 students supply the wind for the car.
Grades 10 - 12 students build a car that is self-propelled.

Grades 5 - 9

Construction

The car may be made ONLY from the following materials: All materials used in construction must be available in local grocery/department stores.

- empty 12 oz soft drink can(s)
- rubber bands
- plastic drinking straws
- cardboard/card stock
- clothes buttons/thread spools (no other
- types of spool)
- entries may have stickers or paint
- decorations, as long as they do not affect
- performance
- paper clips
- metal clothes hanger wire
- glue / tape (any types)
- 8 1/2 x 11 copier paper (20 lb)
- cloth and thread (sewing)

The car must have both a frame (chassis) of any shape and rolling wheels.
The car must have dimensions which allow it to fit into 50 cm x 50 cm x 50 cm cube at all times.
The mass of the car must be greater than 40 grams and must remain in one piece at all times.
The intent is to have students use any amount of the easily accessible materials listed to construct all parts of the car. Students should not use a part that was manufactured for the purpose for which they are using it. e.g. Contestants may not use a propeller that was commercially manufactured to be a fan or propeller or bellows, however, contestants may create similar devices using allowed materials.

For Grades 5-9
The wind device can be made from any materials and can be a manufactured device but must fit inside at 1.0m3 (1 meter x 1 meter x 1 meter cube) box. It must use only the mechanical energy of the participants.

Competition (Grades 5-9)

The course track will be a tiled waxed floor approximately 2 meters wide.
The car must remain in contact with the floor, in one piece, and all parts of the vehicle must remain inside the 2 meter wide course at all times during the trial.
The car must start at rest behind the start line.
Two contestants may supply wind with their lungs or a piece of cardboard, etc. using only mechanical energy supplied by the participants. Commercially manufactured air pumps, fans or bellows are not allowed. No electrical, chemical, magnetic energy may be used. Wind can only be supplied during the competition; wind cannot be stored prior to the start of the trial.
The course will have a fault line 3 meters from the start line. Contestants may enter the area between the start and fault lines and use this 3 meter region to supply the wind. Contestants may stretch arms beyond the fault line and their wind device may extend beyond the fault line provided the contestants' bodies do not touch the floor beyond the fault line.
The contestants may not contact the car during the trial directly or indirectly (except with the wind) but they may move along with the car between the start line and the fault line.
There is a time limit of one minute of student applied power for all trials.

GRADES 10 – 12

Construction (Grades 10-12)

The car may be made ONLY from the following materials: All materials used in construction must be available in local grocery/department stores.

- empty 12 oz soft drink can(s)
- rubber bands
- plastic drinking straws
- cardboard/card stock
- clothes buttons/thread spools (no
- other types of spool)
- entries may have stickers or paint
- decorations, as long as they do not
- affect performance
- paper clips
- metal clothes hanger wire
- glue / tape (any types)

- 8 1/2 x 11 copier paper (20 lb)
- cloth and thread (sewing)

The car must have both a frame (chassis) of any shape and rolling wheels.
The car must have dimensions which allow it to fit into 50 cm x 50 cm x 50 cm cube at all times.
The mass of the car must be greater than 40 grams and must remain in one piece at all times.
The intent is to have students use any amount of the easily accessible materials listed to construct all parts of the car. Students should not use a part that was manufactured for the purpose for which they are using it.
e.g. Students may not use a propeller that was commercially manufactured to be a fan or propeller.

Competition (Grades 10-12)

The course track will be a tiled waxed floor approximately 2 meters wide.
The car must remain in contact with the floor, in one piece, and all parts of the vehicle must remain inside the 2 meter wide course at all times during the trial.
The car must start at rest behind the start line.
All energy for the motion of the car must come from potential mechanical energy stored in the airplane style propellers on the car. The force for motion must be supplied by air or wind.
The stored potential energy must be supplied to the car by hand. No motors, engines or pneumatic devices may be used.
Once the car is release behind the start line, the contestants may not contact the car at all during the trial directly or indirectly.

Judging

The distance will be measured from the start line to the point where the car stops or the point where the front of the car first leaves the course.
One student will release the car at the judge's signal from behind the start line. No motion of the car or its parts and no wind will be allowed until the start signal is given.
Two trials will be allowed for each team and teams may use a different car for the second trial.

Score = (Mass x Distance) High score wins.

Judge: Lee Hirsch / Wootton High School
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website:
http://www.montgomeryschoolsmd.org/schools/woottonhs/academics/finalfront/finalfront.aspx

Return to General Guidelines