

**13<sup>th</sup> Annual  
MCC High School Engineering Competition  
Monroe Community College  
Thursday, April 29<sup>th</sup>, 2010**

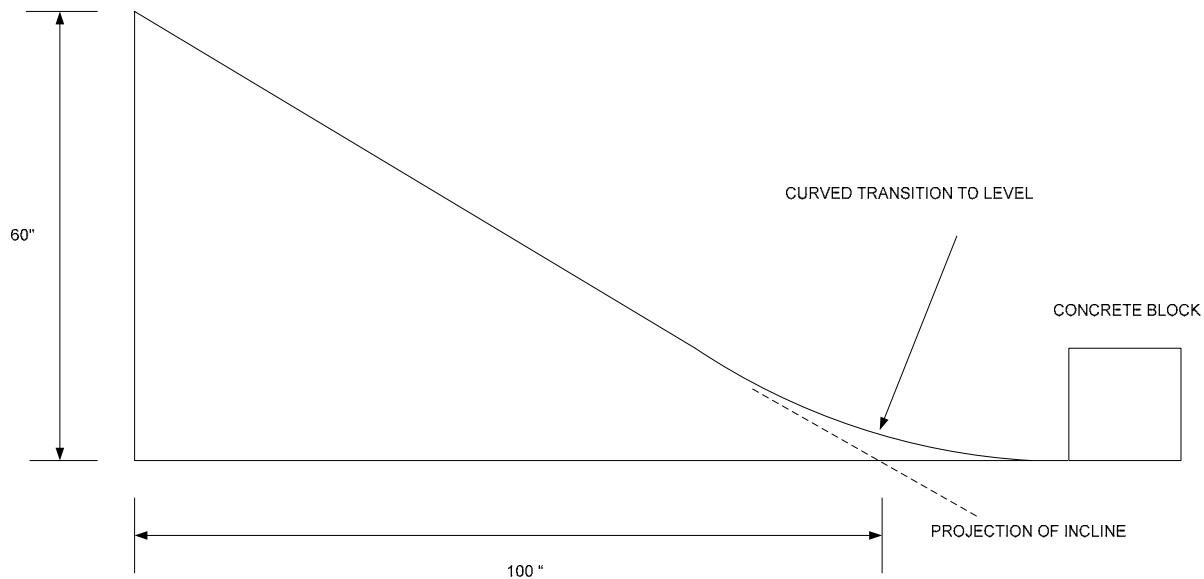
**Event:** Auto Safety

**Objective:** To design and build the lightest model car body that will protect 2 extra large eggs in both a frontal collision with a concrete block and a side-impact collision with an empty wooden auto safety cart. The styling and features that would make it an appealing choice to a car buyer will also be judged.

**Base Vehicle:** MCC will supply each team with a hardwood base which is 1.5 inches thick, 5½ inches wide, and 10" long. The base will have 4 skateboard wheels mounted to it. Teachers must bring their wooden bases to the competition.

**Testing Surface:** A ramp approximately 60" high and 100" long will be set-up with a concrete block at the base as shown below. In the Frontal-Impact test, cars will begin at rest at the top of the ramp and roll down and collide with the concrete block.

In the Side-Impact test, the concrete block will be removed and replaced with the contestant's car. An empty wooden auto safety base will be released from the top of the ramp and collide with the driver's side of the contestant's car.



**Eggs:** Two extra large eggs will be supplied by MCC. The eggs will model the driver and front seat passenger of a car.

**Allowable  
Materials:**

Any commonly available materials may be used as long as no material will create a safety hazard, damage the ramp or concrete block, or make a mess that is difficult to clean.

## **Competition**

**Format:** Points will be awarded for both the static judging of the car's construction, styling and features and the results of the collision with the concrete block.

## **Static**

**Judging:** Each of the two static judging criteria will be graded on a 0-100 point scale. The judges will assess the cars from the point of view that they are car buyers who are in the market for a safe, comfortable, and stylish car.

### **Car Exterior:**

The exterior of the car and will be judged on items such as construction quality, features present, and overall styling.

### **Car Interior:**

The interior of the car will be judged for items such as construction quality, features present, roominess, driver and passenger visibility, ease of getting into and out of the seat and restraints, perceived comfort of the seat and restraints, and overall interior styling.

## **Collision**

**Testing:** If the judges rule that the car is safe to test, it will be first undergo a Frontal Crash by launching it from rest at the top of the ramp and then having it collide with a concrete block at the base of the ramp.

If the car does not earn 0 points in the Frontal Crash, it will then undergo the Side-Impact Crash test. In this test the concrete block will be removed and the contestant's car will be placed at the end of the track so that the driver's side of the car is perpendicular to the direction of the incoming car with the driver side facing the incoming car. The incoming car will be launched from rest at the top of the ramp and collide with the driver's side of the contestant's car.

Points will be awarded on the following basis:

### **A car will earn 0 points if :**

1. The car fails the pre-test inspection.  
**OR**
2. Either egg breaks in either test. An egg with a visible crack of any kind will be considered broken.  
**OR**
3. Either egg is thrown out of the seat it was originally in during either test.  
**OR**
4. The car body detaches from the base in either test.

### **All other cars will be awarded points according to the following formula:**

Points = 100 + 100 x (Mass of Lightest Car not earning 0 Points)/(Mass of Car)

## Rules:

1. Each school may enter a maximum of 4 cars in this event. The teacher must either call or email Sue O'Brien at 292-2488 or [sobrien@monroecc.edu](mailto:sobrien@monroecc.edu) by **Tuesday, April 13<sup>th</sup>, 2010** to tell her how many cars they will enter. The teacher must then bring a completed registration form to the competition for each car entered.
2. At the check-in the mass of the body will be determined before the eggs are loaded and the cart is attached.
3. The car body must be securely attached to the wooden base using the two bolts and wing nuts supplied with the wooden base and remain attached after the collision.
4. No part of the car body may extend more than 3" in front of the wooden base.
5. The body may not touch the track or wheels.
6. The "driver" and front seat "passenger" eggs must be seated the same distance from the front of the car.
7. Bodies may not contain sharp edges or any components that will shatter.
8. Bodies must be constructed to minimize the risk of components flying off the vehicle.
9. Cars may not contain materials that are difficult to clean up after the collision.
10. Minor repairs may be made to a car after the frontal crash as long as they can be completed in less than 5 minutes.
11. Any vehicle, which is judged to present a safety hazard or may cause damage to the track, concrete block or other property, will not be allowed to be tested and receive zero points for the collision test.
12. Each entry from a given school must represent a distinctly different design. Cosmetic differences do not constitute different designs. If a school has multiple entries without distinct differences, only the best finisher with a given design will be counted in the final results.
13. Entries from previous years are strictly prohibited.

## Overall

**Winner:** The car with the greatest point total for the static judging and collision test will be the winner.

Copies of these rules are available at [www.monroecc.edu/depts/eng&phy/highschl.htm](http://www.monroecc.edu/depts/eng&phy/highschl.htm).

For questions call John Wadach at 292-2488 or email him at [jwadach@monroecc.edu](mailto:jwadach@monroecc.edu).