

Health Academy---Edible Car Design Competition



Objectives:

- Design and build a car made entirely out of edible food items.
- Race the car down a ski-jump type ramp to achieve maximum distance from the ramp.
- Report on the design, driver, and the results including potential and kinetic energy measurements.
- Measure the mass & compute the calorie content of each food item & the total calorie content of your car
- Determine what you would have to do (using at least three different activities) & for how long to “burn” off the calories from eating your car

The Teams:

Each team must consist of two to three members. Choose your teammates wisely, each team member receives the same number of points on the project. Teams cannot be altered once the rough draft is handed in!

The Car:

1. The car must be constructed entirely from edible food items.
2. No alcohol or flaming foods allowed!!
3. No alterations to the car may be made, such as, cooking or blending, prior to consumption of the car.
4. You may bring condiments and a beverage to help you consume your car.
5. The car must be able to carry a passenger, a small action figure provided in class. The action figure is made of flexible plastic and all parts are movable. The measurements are as follows: height = 11cm, width = 1.5cm, weight = 30.4g.
6. The car must have two axles and at least four working wheels.

The Ramp:

The ramp is constructed of aluminum. The downhill part of the ramp is 2.5 meters long, 30 cm wide, and makes an angle of 30° with the horizontal. The takeoff part of the ramp has a radius of curvature of 0.5 m and a takeoff angle of 45° to the horizontal. There are no side bumpers along any part of the ramp. Students can start the car anywhere along the downhill portion of the ramp. **No pushing of the car is allowed.**

The Jump:

On the day of the jump all cars will have mass measurements taken before the driver is placed in the car. The car may be placed anywhere on the downward portion of the ramp. The initial height of the car will be measured along with the final distance the car travels after leaving the ramp. The jump distance will be measured from the end of the ramp to the final resting position of the car part containing the action figure. If the driver should fall out of the car at any point, the jump distance will be recorded as **zero**. Remember, this is a competition between members of your class period. Your goal is to have the greatest jump distance!

The Eating (optional):

After all cars have completed the jump and all pieces of each car have been collected by the team members the eating competition will begin. If the team consists of two people, they will be allowed 6 minutes to consume their entire car. If the team consists of three people, they will be allowed 4 minutes to consume their entire car. Any uneaten car parts will have their mass measured and recorded.

In the event that the contest cannot be completed in just one class period, teams must provide an airtight container for the storage of their car overnight. **No refrigeration** will be provided.

If you choose to eat your car up to **5 points** of extra credit will added to your final report grade. Make your food choices wisely as you are responsible for how your stomach feels after the competition. Remember: eating your car is optional! Up to **5 extra credit points** for a healthy food car

The Report:

A report including the following items will accompany your car:

1) **Title page:** be sure to include your names and class period. Be creative.
2) **Hypothesis:** How do you plan to build your car? Why are you choosing these materials? What is the food theme you are using to design your car? (All cars must have a food theme. Examples: carbohydrates, candies, chocolate, late night snacks, veggies.)

3) **Scaled diagrams:** front view, side view, back view, and top view must be included. Diagrams must be hand-drawn on graph paper. Each view must include a scale (ex: 1 cm = 0.5 cm) and measurements for all parts. Each diagram must be drawn on a separate sheet of graph paper. The diagram should fill the majority of the page. A listing or labeling of all food items must be included on the diagrams. Measurements of each car part must be included on the diagram.

4) **Driver Profile:** Be creative. Provide information on important statistics such as: age, height, weight, hair color, eye color, occupation, and how they driver became an edible car racer. Make certain it is school appropriate.

5) **Statistical information:** include the following: length, width, and height of the car, mass of car before jump, mass of car remaining after eating, initial height of car, jump distance. This data should be displayed in a data table format. Work must be shown for calculations of initial Potential Energy and velocity at the bottom of the ramp (use the law of conservation of energy to calculate v_f .) Equations used and substitution with units must be present. Show all work for the calculations.

6) **Calorie content:** Include the mass of each food item & its caloric value. Determine the total calorie content of the car
Determine what you would have to do (using at least three different activities) & for how long to “burn” off the calories form eating your car

6) **Conclusion:** Discuss the results of the competition. Include information on how well your car performed (what place did it receive) and any modifications you would make to the design if you were to compete again. You may also include information about how the car tasted (if you choose to eat it.)

7) **Photo of completed car (optional):** A photo of the completed car before the jump can be included. You may also choose to include a photo of what the car looks like after the jump and after the eating. You must provide your own camera/film for this portion.

Important Dates:

Project information handed out: Monday, November 22, 2010

Rough Draft of Report parts 1-4: Monday, November 29, 2010

Car Competition: Friday, December 3, 2010

Final Draft of Complete Report: Friday, December 10, 2010



*****All due dates will be strictly enforced. NO late work will be accepted! Your project and report must be here even if you are not. Cars can only be tested on the ramp on Friday, December 3, 2010 during your class period.**

Edible Car Design Competition Scoring Guide



The Car:

- 1) Made entirely from edible material (20 points) _____
- 2) Functional wheels (10 points) _____
- 3) Food theme followed (10 points) _____

The Competition:

- 1) Jump distance (10 points) _____

The Report:

- 1) Cover page (neat and colorful) (10 points) _____
- 2) Hypothesis (10 points) _____
- 3) Scaled Diagrams with foods labeled (10 points) _____
 - a) Measurements included (10 points) _____
 - b) Each diagram hand-drawn on graph paper (10) _____
- 4) Driver Profile (10 points) _____
- 5) Results in data table format (10 points) _____
- 6) Statistics/calculations (20 points) _____
- 7) Determination of calorie content of car (10 points) _____
- 7) Conclusion (10 points) _____

Total (160 points) _____

Extra credit: percent of car eaten (5 point) _____

Healthy car (5 points)

Photo of car (5 points) _____

Project rough draft will be scored using criteria 1-4 of the report section. The rough draft will be worth 40 points.

Total project (rough draft plus final draft) will be worth 200 points. This is equivalent to two test grades.