

SEMESTER #1 CREATIVE PROJECT

“GOING THE DISTANCE” --Exploring Science in motion



DUE DATE:

OBJECTIVE: You have been given the opportunity to apply as a car designer for the SMITH MOTOR COMPANY. Your goal is to design a car that will travel the **greatest distance** from the bottom of a ramp. This is not a speed challenge.

In order to secure your position with the company, you have been asked to submit:

- 1) A letter of introduction (cover letter)—SPECIFIC INSTRUCTIONS ON NEXT PAGE.
- 2) An “ENERGY SYSTEM DRAWING” of the car/ramp system—SPECIFIC INSTRUCTIONS ON NEXT PAGE
- 3) A prototype of your car for review INCLUDING a unique car logo imprinted on car.

APPLICATION SPECIFICS:

- 1) You **may** work with **ONE** partner to build a single car together (car prototype). Your partner may be from any of my classes.
- 2) **Each** applicant (partner) **must** submit an **original** application cover letter and energy system drawing (see reverse side for specific guidelines)

RAMP DIMENSIONS:

LENGTH OF RAMP: 60 cm

HEIGHT OF RAMP: 31.5 cm

HOW TO EARN AN “A”:

- You must design and build a prototype car that travels the required distance and uses only allowed materials (PART 1).
- You must complete the “Going the Distance” letter of introduction (PART 2).
- You must complete an energy system drawing for the car/ramp system (PART 3).

****IMPORTANT NOTES****

****Tampering with another applicant’s project in ANY WAY will result in an Automatic F.****

****In order to receive full credit, your application must be completed on time****

HOW TO WIN “BRAGGING RIGHTS” (and get the job)

The car that travels the greatest distance in each class will receive an award

The “MOST CREATIVE CAR” in each class will receive an award

PART ONE: THE CAR

Guidelines for the: CAR PROTOTYPE

ITEMS YOUR CAR MUST CONTAIN	ITEMS YOUR CAR MUST NOT CONTAIN
<ul style="list-style-type: none"><input type="checkbox"/> A design that allows it to travel AT LEAST 1 meter from the bottom of the ramp (ramp dimensions given in the “objective” on page 1)<input type="checkbox"/> Wheels made from SOMETHING OTHER THAN wheels (anything that rolls but cannot be defined as a “wheel”)<input type="checkbox"/> At least TWO axles	<ul style="list-style-type: none"><input type="checkbox"/> A mass greater than 1 kg (2.2 lbs)<input type="checkbox"/> Actual Wheels taken from ANYTHING...that’s right, ANYTHING<input type="checkbox"/> Pre-assembled car, pinewood derby car, car kit, NOR body parts from toy cars<input type="checkbox"/> The car’s length or width greater than 30 cm



Part TWO: THE LETTER OF INTRODUCTION



Guidelines:

Your letter must be AT LEAST ONE PAGE (12 pt font, double spaced, 1 inch margins). Your application may be typed or hand-written (neatly, in black or blue pen only).

Your letter must include the information detailed below, must be in complete sentences, and must contain at least 5 sentences per paragraph.

****EACH PARTNER MUST WRITE A SEPARATE, ORIGINAL LETTER****

YOUR APPLICATION MUST INCLUDE ALL OF THE FOLLOWING:

PARAGRAPH ONE: Introduce yourself and explain why your car is the best design for the needs of the company. Explain your reason for designing the car the way you did. For example: How did you decide to distribute the car's weight? Why did you use the materials you used? What problems did you encounter in designing and building your car? How did you solve these problems?

PARAGRAPH TWO: Describe the physics (motion, force & energy) concepts involved in the project. (Refer to chapters 9 and 10 in your textbook). For example: What forces act on the car as it travels down the ramp? What types of friction are acting on your car? What effect does gravity have on your car? Discuss how you designed your car to minimize the forces acting against your cars motion.

CAR LOGO: Create a unique car logo for your car design (see examples at top of page). Your logo must be **NO SMALLER THAN 7 X 12 cm** AND it must be an original logo design (10% rule)

Part THREE: ENERGY SYSTEM DRAWING

Guidelines:

You must include:

1. Drawing of the CAR/RAMP system that includes **ALL** components of the system **AND** indicates the boundaries of the system.
2. Draw an GIVER/RECEIVER ENERGY FLOW DIAGRAM indicating the transfer of energy through the system **BEFORE** the car is released from the top of the ramp.
3. Draw an GIVER/RECEIVER ENERGY FLOW DIAGRAM indicating the transfer of energy through the system **WHILE** the car is moving down the ramp.

****IN your system drawings, label the following: GRAVITATIONAL POTENTIAL ENERGY; FRICTION; AIR RESISTANCE; KINETIC ENERGY (energy of motion), POTENTIAL ENERGY**

PROJECT GRADING SCALE

PART 1: Car design/ Quality Craftsmanship50

- Is it well-built?
- Is it a creative/unique design idea?
- Does it show time was invested in its creation?

PART 2: Letter of Introduction25

PART 3: Energy System drawing.....25

- Does it include the car/ramp system?
- Does it include an energy flow diagram BEFORE motion occurs?
- Does it include an energy flow diagram WHILE motion is occurring?

TOTAL POINTS POSSIBLE.....100

Extra credit- for exceptionally creative or well-built car.....10