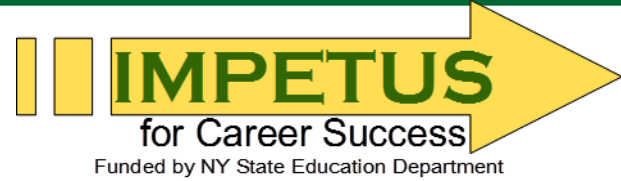




Funded by NY State Education Department

Helpful Website

<http://www.aapt.org/Programs/contests/rollercoaster.cfm>



Funded by NY State Education Department

Roller Coaster Design

Competition

Guidelines and Suggestions

*Buckle Up!
Hold Tight!
Enjoy The Ride!*

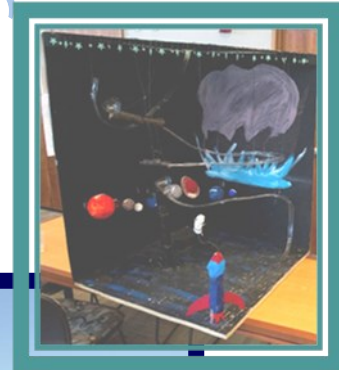


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A highlight of the Clarkson STEP Program is the annual Roller Coaster Design Competition. The main purpose of this brochure is help teams in building a unique and prize-worthy roller coaster to showcase at the competition. On the following pages you will find a suggested timeline, contest rules, point system, and pictures from previous years. Have fun!

April

“Competition”

The show is ON so it is time to show OFF your hard work. Avoid disappointment by knowing and following the rules. Here is a sample rubric. **Check for updates.**

Technical Score (25 pts + Potential for BONUS POINTS)

Longest Time (up to 30 sec.) (maximum 25 pts)

Bonus Points

- (a) 5 pts. per loop. (Max 3 loops for 15 points)
- (b) 0-15 pts. openness.
- (c) 0-10 pts. engineering

Theme (creativity) Score (35 pts)

Ride has potential to be purchased and built by an amusement park

Rider Enjoyment (35 pts)

Entries will be judged for rider enjoyment

Engineering Workbook (25 pts)

Document your Design and Build by completing your Engineering Workbook. Submit your Engineering Workbook answers on Moodle.

Coaster Rule C A ball must be provided by the team on judging day. The ball must be either a glass marble of regular size or greater, or a steel ball that is 1 cm (1/2") in diameter or greater.

Coaster Rule D Magnets, electricity, springs and other forms of energy may not be used. This is a "gravity ride" only. These other sources of energy can be used for esthetics (i.e., background lighting). No electricity is provided in the contest area.

Coaster Rule E The start position at the top of the first hill must be marked. The steel ball or glass marble must end in a designated area or container.

February

“Design & Support”

The roller coaster design does not stop at the first hill.

In fact it is just beginning.

Based on the sketches made in November, what's next?

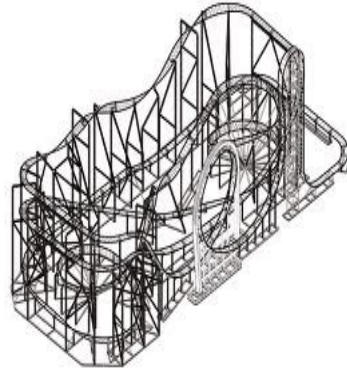
Loops? Twist? Turns?

How will your roller coaster progressively decrease in elevation?

More importantly

how will this design be supported? Now is the time to find what works in supporting your structure.

Coaster Rule B The model should be designed for a steel ball or glass marble. This means that the steel ball or glass marble when released from the top of the first hill by the judge will travel through the entire ride to arrive at the bottom loading platform. (Note: For this contest, you will raise the steel ball or glass marble by hand from the loading platform to the top of the first hill to start the "ride".)



March

“Decorations”

Pat yourselves on the back! The structure of your roller coaster should be complete, now it's time to bring out your theme!!!



Timeline

September
Jumpstart Discussion
Introduction to Project

November
Material & Sketches

January
Initial Hill & Stunt
Designs

March
Decorate Your Coaster

October
Discuss Possible
Themes & Build Base

December
Intermission/Break

February
Design of Support
Structure

April
Competition!



September

“Jumpstart Discussion & Introduction to Project”

The year has just begun, September is a great time to brainstorm ideas for themes and designs.

Discussion Questions:

- ◇ What is your favorite roller coaster?
- ◇ What themes could you have?
- ◇ What is your favorite movie/show/game/food?
- ◇ What supplies should you be on the lookout for?

Remember the possibilities are endless, but narrowing down to a few great ideas will help the process run smoothly.

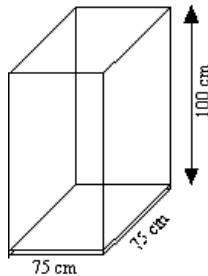
October

“Theme & Base Cut”

By October the questions should have switched from “what to do?” to “how to make it happen?” A theme should be determined by this time and you can begin to build the regulation sized base.

Coaster Rule A

Size restrictions - the base must fit within a square footprint that is 75 cm x 75 cm. The overall track must fit within a rectangular box 75 cm x 75 cm x 100 cm high, including all decorations.



November

“Material & Sketches”

Now it's time to brainstorm your theme and how it will be incorporated into the roller coaster.

Guiding Questions:

- ◇ What should the roller coaster look like?
- ◇ What materials should you use?
- ◇ What materials do you have access to?

Draw a few sketches and narrow down to one design that can be done with the materials you have access to.

“Intermission”

Due to the numerous activities during the holiday season excitement, **December** can be used to collect supplies (gift wrapping paper rolls, boxes, paper) and review your plan!

January

“Biggest Hill”

The entire potential of your rollercoaster is dependent on the first hill and gravity.

Q: Why is the first hill on a roller coaster the highest hill on the entire ride?

A: The first hill on a roller coaster is the biggest because it will need enough speed the ride. The initial height is an important measurement. If the first hill is too big the car may fall off the track, if it is too short the car may not be able to finish the ride.

