

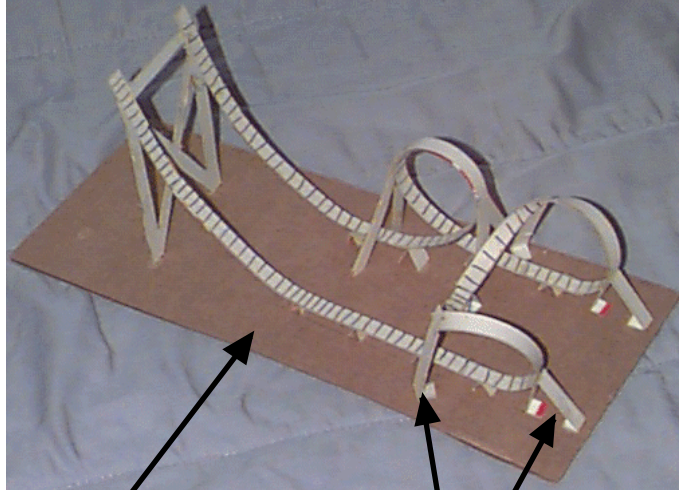
ROLLER COASTER PHYSICS

Roller Coaster Design Activity

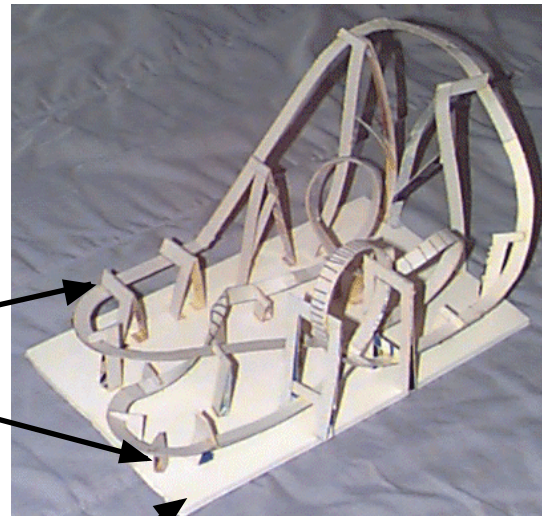
Objective: To design and build a simple, to scale, 3-D, roller coaster model.

Design a roller coaster on paper, show the velocities, g's felt, and heights. The diagram needs to be neat and readable. The model is to be to scale on a piece of card board. The track is made from paper. The supports are made from manila folder or foam core board. The lines on the track represent the cross-ties on the track. Please print them off on a computer or draw them VERY neatly and evenly spaced.

Your design must at least have an initial drop, a hill, a loop and a banked curve.



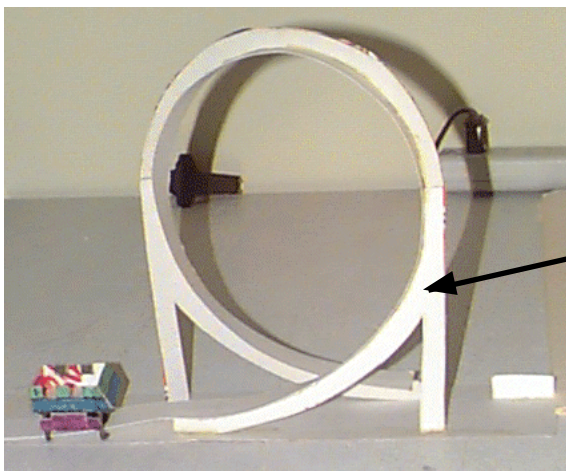
Hanging coaster like the *Alpengeist*



Card board base

Manila folder or foam core supports

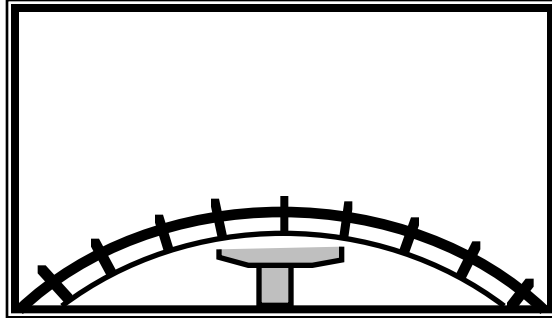
Foam core base



Foam core sides to give this irregular shaped loop some needed rigidity. The track is laid inside the loop.

ROLLER COASTER PHYSICS ONE FINAL NOTE OF PREPARATION

This year when you go to the amusement park bring a cam corder and a camera. Video tape the roller coaster rides. Choose a hill where the cars are not moving too fast. Zoom the cam corder on the hill without moving the cam corder. The train will pass in and out of view. Next year show the class the video tape. Have the students use the tape to calculate the velocity of the train at this spot on the hill. It is great real life practice. Below is an example of the view frame for such a taping.



VIEW FRAME OF THE CAM CORDER FOCUSED ON THE ROLLER COASTER'S TRACK ON A HILL.

With the camera, take pictures of loops, hills, curves, etc. Either use slide film or make these pictures into overheads. You can show them to the students before they go so they will be prepared to take the right measurements. You can also use these pictures so students can look at the hills on a roller coaster and rate them in terms of velocity over the top of each.