Rubric for the Home Roller Coaster Project

Name: _____

Partner(s):_____(Include names of family members if they helped)

- Design a 4-element marble roller coaster with a partner from the same class.
- Deliver to school by May 10th, 6:00-8:00 p.m.
- Keep a journal of the process. Record in composition book.
- *Assess whether you met project criteria by writing comments in the appropriate box. See example below. Do this before bringing coaster to school for the in-class assessment.*

(Example)	Meets Mastery	Redesign Needed
Gravitational force		*Marble only made it through the first two elements - too many elements*
Design elements	*Drop, loop, two camel backs, and an inversion*	

Scoring Rubric for Home Roller Coaster

	Meets Criteria	Redesign Needed
Material Design: Made from scratch, open-topped, sturdy—meaning the marble completes the circuit every time you drop it from the top of the drop. **(40 points)**		
Gravitational Force: Marble stays on track entire time, only gravitational force used, marble completes the circuit. **(50 points)**		
Design Elements: Has four or more elements that includes a drop, two camel backs, and an inversion of some type. Minimum height of camel back is 13 cm. **(50 points)**		
Size: Must use pegboard given in class. Track should not go off the pegboard. Height can be no higher than 1.5 meters. **(20 points)**		
Journal: Description of the process: includes date, time, where materials were acquired. Describes problems and solutions. Include all information from project planning sheet. Include charts. **(30 points)**		
Scaled Model: RC is scaled in composition book. (This may be done in math class or science class. Use scaled maquette. • Label potential and kinetic areas		

• Label x and y axis • Flat view with track stretched out **(20 points)**		
Calculations: Calculations show the formulas set up correctly, the answer, and the label. **All** numbers are labeled. This part is done in class. **(50 points)**		

TOTAL POINTS POSSIBLE: 260 ***POINTS EARNED:_____***

Checklist for Bonus Points:

Included setting, surroundings		Included more than 4 elements	
Designed continuous circuit		other	

Parent Signature:_____
I have seen my son/daughter's project and read their comments on the Scoring Rubric.

Performance Assessment Conducted During Class:
Record the following measurements on the class charts:

- Average speed
- Top speed
- Top height
- Angle of the first drop
- Slope
- Force
- Momentum
- Acceleration of drop
- Kinetic Energy
- Potential Energy
- Mass of the marble

Below are the results of the experiments that I tried with different weights of marbles (use scientific explanation):

Sketch the design of your roller coaster on the back or on another sheet of paper. Make sure you have a picture taken of your coaster with the designer(s)!

Be prepared to answer any of these questions orally in class:

- How does the ride demonstrate the law of inertia?
- How does the ride demonstrate the law of unbalanced forces? (Newton's 2nd, mass x acceleration = force)
- How does the ride demonstrate action-reaction pairs of forces?
- What transformations of energy are taking place in the ride? (forms and types of energy)