

Name: \_\_\_\_\_

Partner(s): \_\_\_\_\_

(Include parent of family members if they helped)

### Roller Coaster Project Description and Scoring Rubric

- Design a 3-element marble roller coaster (May use other car design)
- Work in partners or groups up to three people
- Deliver to the school on May 8th from 5:00 p.m. - 9:00 p.m. or May 10th from 6:45 a.m. - 8:00 a.m. Roller coasters cannot be accepted after 8:00 a.m. on May 10th.
- Keep a journal (record in comp book) during the process.
- Get parent signature
- *Fill out scoring rubric below before bringing the roller coaster to school. Explain why you chose the column by writing comments in that particular box. See example below.*

	Meets Mastery	Re-design
<b>Gravitational force</b>		Marble only made it through the first two elements - too many elements
<b>Three design elements</b>	Spiral, loop, two camel backs, and an inversion	

	Meets Mastery	Re-design
<b>Material Design-</b> Made from scratch, open-topped, sturdy		
<b>Force-</b> Marble stays on track the whole time, any gravitational force used, marble completes the circuit		
<b>Design Elements-</b> Has three or more elements		
<b>Size-</b> Minimum of 75 cm in length, width, and height		
<b>Journal-</b> Description of the process: includes date, time and money spent, and where materials were acquired. Describes problems and solutions.		

**Bonus points**

Included setting (surroundings)		Included more than 3 elements	
Designed continuous circuit		other	

\*\*\*Parent Signature: \_\_\_\_\_

I have seen my son/daughter's project and read comments on scoring rubric

**In class work:**

- My roller coaster's top speed is \_\_\_\_\_. Record on class chart.
- The average speed is \_\_\_\_\_. Record on class chart.
- My roller coaster's top height is \_\_\_\_\_. Record on class chart.
- Mass of marble is \_\_\_\_\_. Record on class chart.
- I used the photogates for acceleration. It recorded \_\_\_\_\_. Record on class chart.
- Calculate the angle of the first drop \_\_\_\_\_. Record on class chart.
- Below are the results of the experiments that I tried with different weights of marbles (use scientific explanations):

**Sketch the design of your roller coaster****What materials did you use?**

**Describe what is both good and bad about the material you chose?**

**Pick a segment of your journal to share**

**Be prepared to answer any of the 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)

