**The Energy Behind A Roller Coaster**

**Performance Based Rubric**

**Marble Roller Coaster Project Criteria**

 **Calculations (MUST SHOW WORK WITH UNITS)**

* **Height of initial drop, height of hill, height of loop, total length of track, mass of marble**
* **Calculate the Potential Energy at a specific point (must specify at which point).**
* **Calculate the Kinetic Energy at a specific point (must specify at which point).**
* **Calculate the Velocity (speed) of the marble over a set distance (must specify over which distance).**
* **Calculate the Acceleration of the marble over a set distance (must specify over which distance).**
* **Describe the marble’s journey from start to finish using the following terms (underline the terms in your description): *kinetic energy, potential energy, velocity, acceleration, friction, inertia, momentum, gravity, mass***

**Roller Coaster/Schematic**

* **Have a schematic of your roller coaster (an illustration with measurements will be sufficient; should be precise).**
* **Color Code and Label the following areas on your illustration:**
	+ **Most PE.**
	+ **Most KE.**
	+ **Where PE is converted to KE.**
	+ **Where KE is converted to PE.**

**Test Run**

* **Test your roller coaster to verify that the marble will travel entire track (you are allowed 3 tries for a successful run).**

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| **Standards** | **Developing** | **On-Target** | **Mastery** |
| ScienceSchematicTest Run | No drawing provided.  Drawing not to scale or labeled. On lined paper or too small.All three trials are unsuccessful. | Drawing provided.  Drawing is close to scale and contains some labels. On 8 x 12 copy paper.Successful test run with modifications. | Drawing is detailed and labeled. Drawing is to scale and colored.  On 8 x 12 copy paper.Successful test run without modifications. |
| MathCalculations | No specifications or calculations provided.Does not include all necessary components.Not accurate or organized.  | Contains some specifications and/or calculations.  Includes some necessary components.  Accurate, however not organized. | All specifications and/or calculations provided. Includes all necessary components.  Accurate and organized.  |
| ELA | Little to no physics terminology was used in the multimedia presentation.No summary of a roller coaster engineering career was included in the presentation. | Some physics terminology was used in the multimedia presentation.A very basic summary of a roller coaster engineering career was included in the presentation. | Technical physics terminology was used in the multimedia presentation.A thorough summary of a roller coaster engineering career was included in the presentation. |