Roller Coaster Report Due Tues/Wed, Feb 20/21

# **Paper must be TYPED, PRINTED and in MLA format.**

\*\*You must attach your sketch

**Questions**

1. On your roller coaster, label…
   * Where the rollercoaster has the max potential energy
   * Where the rollercoaster reaches its max speed (“Max speed”)
   * Pick **three** places in the middle of your roller coaster. Label these places with a star \*. Make up reasonable heights and label them.
2. Draw energy pie charts and energy bar graphs for all 5 locations from question 1. (Use the chart function on word/google docs to create charts on the document).
3. Describe what’s happening to the energy of the marble **at the star \*** places you picked in question 1. Use the terms “potential energy”, “kinetic energy”, “increasing”, “decreasing”, “speed” and “total energy”. Then explain how you know, in terms of the height and speed of the marble.
4. How would the marble behave differently if we assumed there’s a small amount of friction between the track and marble (like a real roller coaster)? What would happen to the energy of the marble as it rolls over the track?
5. If you wanted to give the marble more Kinetic Energy, what two variables would you have to change to directly affect the Kinetic Energy? If you wanted to increase the Potential Energy of the marble, what are the only two things you can do to directly increase this?
6. As you build your rollercoaster, you may have come across the problem of your marble not going through a loop. What type of energy do you need to give your marble more of? What are two ways to fix this problem on the roller coaster?
7. Your marble completes the entire ride in only 9 seconds, without adding any extra tracks, what adjustments would you make?

**Calculations done in Math class DUE TBD IN MATH CLASS**

**\*\* If you are in Integrated Math 2, you must do these questions on your own.**

1. Use your sketch and *substitution* to calculate the speed of your marble at all 5 locations. You must attach all of your work from start to finish for each location.