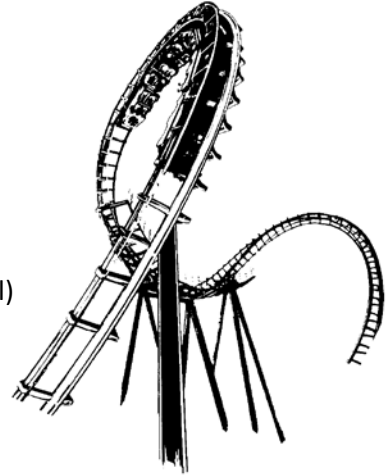


Sidewinder

Analyze the Sidewinder using the ideas of energy conservation, power and work.

1. The ride starts out by lifting the train of mass 8255 kg (when full) to the top of a hill of height 36.9 m behind the station.
 - a. What is the Potential energy at the top of the hill?



- b. What should be the speed at the bottom in an ideal situation?

2. Since this is not an ideal situation, energy was lost during the run from the top of the hill to the station.
 - a. What is the speed of the train at the bottom of the hill? The length of the train is 18.3 m. (Hint: see Appendix B.)

- b. How much energy was lost?

- c. Assuming your laptop uses 90 Watts of power to run, how long could you have powered it using the energy lost by the roller coaster?

 - d. If you pay \$0.10 kW/hr for electricity, how much was that energy worth?
3. Gravity does work whenever the height of an object is changed.
- a. How much work did it do between the station and when the train was lifted to its highest point?

 - b. How much work did it do between the time when the train was released and when it came back through the station?