

SPEED IS KEY

You survived the first drop of Cannibal and are well on your way to the end of the ride. This ride is a great example of kinetic energy, which you will be calculating below. Here, we assume that the initial velocity is zero and it's a frictionless coaster.



Useful Equations

' v_{final} ' is the velocity at the bottom of the tower

' g ' is the acceleration due to gravity

' t_{avg} ' is time in seconds to reach bottom of tower

'KE' is the kinetic energy

' m ' is the mass (assume 1000 kg for the mass of the car)

$$v_{final} = g * t_{avg} \quad KE = \frac{1}{2} m * v^2$$

Questions

1. Watch Cannibal run 3 times. Using the iPhone or iPod "Stopwatch Analog+Digital" or the Android "StopWatch and Timer" application, measure the time it takes for the car to travel from the top of the tower to the bottom for each of those runs. Determine the average time.

$$t_1 = \text{_____} s \quad t_2 = \text{_____} s \quad t_3 = \text{_____} s \quad t_{avg} = \text{_____} s$$

2. Now that ' t_{avg} ' is known, calculate the velocity of the car at the bottom of the tower?

$$v_{final} = \text{_____} m/s$$

3. Use the velocity found in Question 2 to calculate the kinetic energy of the car at the base of the tower.