

## ROLLER COASTERS - Quantitative

# *GRIZZLY VORTEX DEMON FLIGHT DECK*

### DATA

#### Before you ride

Height at the highest point of the ride \_\_\_\_\_

Height at the lowest point of the ride \_\_\_\_\_

Length of a train \_\_\_\_\_

Radius of the "dip" at the bottom of the first hill \_\_\_\_\_

Time for a train to pass a point at the top of the first hill \_\_\_\_\_

Time for a train to pass a point at the bottom of the first hill \_\_\_\_\_

#### While you ride

Maximum acceleration (in g's) \_\_\_\_\_ experienced at \_\_\_\_\_

Minimum acceleration (in g's) \_\_\_\_\_ experienced at \_\_\_\_\_

**QUESTIONS - Quantitative** (Show all work, including the equations you used. Do your work on the back of this page.)

1. What is the speed at the top of the first hill?
2. What is the speed at the bottom of the first hill?
3. If all of the GPE and KE at the top of the first hill is converted to KE at the bottom of the dip, how fast should the train be going?
4. How does your calculated speed in #3 compare with #2 above? Explain any differences.
5. Using the value from #2 above, what is the centripetal acceleration (in g's) in the dip?
6. Using the value from #5 above, what is the total acceleration (in g's) in the dip?
7. How does the total acceleration you calculated compare to your measured acceleration? Why should they be the same or why should they be different?