

**GRIZZLY**

**GRIZZLY**

**DATA:**

\*Height at top of first hill: \_\_\_\_\_

\*Height at bottom of first dip: \_\_\_\_\_

\*Radius at bottom of first hill: \_\_\_\_\_

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

Time for train to pass the top of first hill: \_\_\_\_\_

Time for train to pass the bottom of first dip: \_\_\_\_\_

Maximum vertical acceleration ( $a_v$ ): \_\_\_\_\_ g's

**PROBLEM** Use the back of this page as needed to do your work on this problem.

1. How did you find the height at the two places you were asked?
2. Find the speeds of the train at the top of the first hill and at the bottom of the first dip using basic  $v = d/t$ .
3. Using energy conservation, determine the theoretical speed at the bottom of the first hill. Compare with the value you calculated in #2.
4. Using both calculated values for the velocity at the bottom of the first hill, determine what the vertical acceleration should have been at the bottom of the dip. Compare with your measured value.
5. What reasons can you give for differences between the calculated accelerations and your measured values. (At least three different reasons should be given!)

\*Disclaimer: Due to overgrowth of the trees, we are unable to provide a convenient SPOT to measure both heights. Students are encouraged to work out a process for making these measurements, thus completing this worksheet.