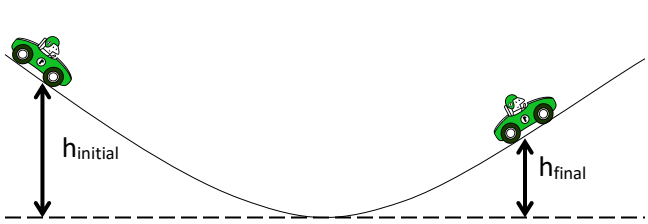
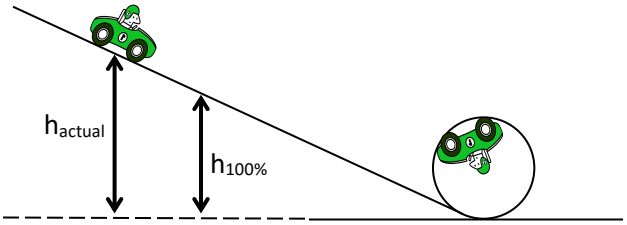
Name: _____ Hour: _____

Loop-the-Loop

Purpose: To calculate the minimum drop height required for a hot wheels car to make it around a loop.

Procedure:





Data Table:

Part 1 **Determining Efficiency of Track**				
Initial height (m)	**Final Height** (m)			**Efficiency** (%)
	Trial 1	Trial 2	Avg	

Part 2 **Calculating Drop Height**		
Loop height (m)	**Drop height** **(100% efficient)** (m)	**Drop height** **(actual efficiency)** (m)

Calculations:

Show all work, including formulas, algebra, plugged-in numbers, units, and circled answers.

- Efficiency
- Velocity at top of loop
- Drop height (100% efficient)
- Drop height (actual efficiency)
- % error – if needed

Questions:

1. What is the magnitude and direction of the acceleration of the car at the top of the loop when the car just barely makes it around the loop?
2. If the car were given a little push down the ramp, would the minimum drop height be higher or lower? Why?
3. Where along the track (with the loop) does the car have the greatest speed? Why?

Results:

Did your car just barely make it around the loop on your first attempt? If not, what was your % error?

Discussion:

- Why does the car need to be dropped from a higher position than the conservation of energy suggests? Where does the lost energy go? Be specific.
- List and briefly describe 2 measurement errors that might have affected your results. Be specific.