

Calculations & Questions:

1 What is the ratio of starting height to loop diameter for both angles? Show the numbers you used as well as the final answer.

Starting height (m) Loop Diameter m) =

Starting height (m) Loop Diameter m) =

2 Does the angle of the ramp affect the g's felt if the starting height of the marble is the same?

Use the numbers relating from the "First track angle" to answer these questions.

- 3 How fast was the marble traveling when you released it at the top of the track (m/s): _____
- 4 Use energy relationships to calculate how fast the marble was traveling when it traveled over the top of the loop (m/s): _____

All heights are in meters.

Speed at the loop's top = $\sqrt{(2)(9.80)}$ (Starting height on ramp - ball's height at the loop's top) Show your numbers and calculations here:

Lah



5 Use the a_c formula to calculate the centripetal acceleration of the marble as it traveled over the loop's top (m/s²)

$$a_{c} = \frac{(2)(9.80)(\text{starting height on the ramp - ball's height a the loop's top})}{(\frac{1}{2})(\text{ball's height at the loop's top})}$$

Show your numbers here:

6 Calculate the g's experienced on the marble.

g's experienced = $\frac{(2)(\text{starting height on the ramp - ball's height a the loop's top)}}{\left(\frac{1}{2}\right)(\text{ball's height at the loop's top})}$

Show your numbers here:

ANSWER: _____

7 How do the g's experienced by the marble <u>compare</u> to the acceleration due to gravity on the surface of the Earth? G's on the Earth's surface equals, "1 g."