**Lab 1: Acceleration Due to Gravity**

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**Introduction:**

Gravity is natrual phenomonen which which pulls two particles together. The gravity on earth pulls all the object to the centre of the earth, which gives objects weight. This purpose of this experiment is to find the gravity in Toronto by launching up a cart on a ramp of different angles. In this experiment, five different angles were tested, and there are five trails conducted for each angle. When the cart is launched upward along the ramp, the gravity is pulling on it, causing it to have a acceleration which is opposed to it’s motion. And while the cart is moving downward, that gravity causes it have an acceleration towards its direction. The acceleration can be calculated from the position-time graph plotted for each trial, and gravity can be calculated using the acceleration and the sine of each angle. Generally, when the air resistance is neglected, the g on earth surface should be a constant regardless the angle of the ramp.

**Experiment procedure:**

1. First, the track is leveled using a spirited leveler. The cart is warmed up for a few minutes to reduce the friction, and the sonar device is connected to pasco interface, which records the data of position and time in capstone.
2. By placing stackable masses under one end of the track, the end is raised so that it forms an angle with the horizontal direction. The track is set to the following five different angles by adding more stackable masses.
3. Measure the height of the stackable mass, and the length between two fixed supporting points along the track, which can be used to calculate the angles.

* Run 1: 0°± 0.05cm
* Run 2: 1.0929
* Run 3: 1.79078
* Run 4: 2.55229
* Run 5; 3.31426

1. launch the cart up the ramp five times for each angles with moderate force so that it would not bounce off the end of the track.
2. Plot the data on capstone with a quadratic function fitted through the recorded points (insert formula)
3. calculating the acceleration for each trial by multiplying the acceleration by 2
4. calculate the g

calculation:

sample calculation:

run #1: angle equal to sin

acceleration=

gravity

mean of uncertainty:

run#1

gravity:

graph

graph

discussion:

results: