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PH114-08

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INCLINED PLANE

Statement of Purpose:

Our group will observe a cart of specific weight on an inclined track to determine the relations between the angle of a plane and an objects force due to gravity.

Introduction:

This experiment taught us about the nature of angles in physical diagrams. We learned that the trigonometric rules applied to find an angle of downward force hold true to the physical world, and how to calculate these forces and angles. This experiment involved setting up an inclined plane, a cart with a known weight, and then calculating a suspected force that the cart would apply to the force sensor along the track.

Equipment:

Datastudio, cart, track, ringstand, force sensor, balance, meter stick, masses.

Procedure:

1. Start up Datastudio.
2. Configure Datastudio along with Part 1 instructions.
3. Give up, the instructions don’t make sense.
4. Have the lab instructor show you how to get Datastudio working.
5. Measure the mass of the cart.
6. Set up the track to have an incline of 10 degrees.
7. Place the force sensor on the track and zero it.
8. Place cart above sensor on track and record the sensor’s reading.
9. Repeat for 15 and 20 degrees.

Data:

On data sheet.

In the above graph, the slope was found to be .991

Analysis:

The data we collected on Part1 returned a slope of .99 when plotted. This indicates that the force sensor was well calibrated. In Part2 we saw that our calculated forces closely resembled those gathered by the force sensor. The trend of angle to force showed us how the angle of an incline affects the perceived force along the plane. This relation appears to be linear, though more data could prove or disprove the apparent correlation. The average range was .12N, and the percent difference between our calculated forces and the readings is 9.3%. This means that our data may not be as accurate as we would like, but should still hold true to the physical properties that we’ve witnessed.

Conclusion:

In our experiment we discovered the relation between various aspects of gravity and trigonometric properties of inclined planes. We have learned to calculate the force of an item that is on a frictionless plane along the plane.