

# Physics 151 - Lab 3

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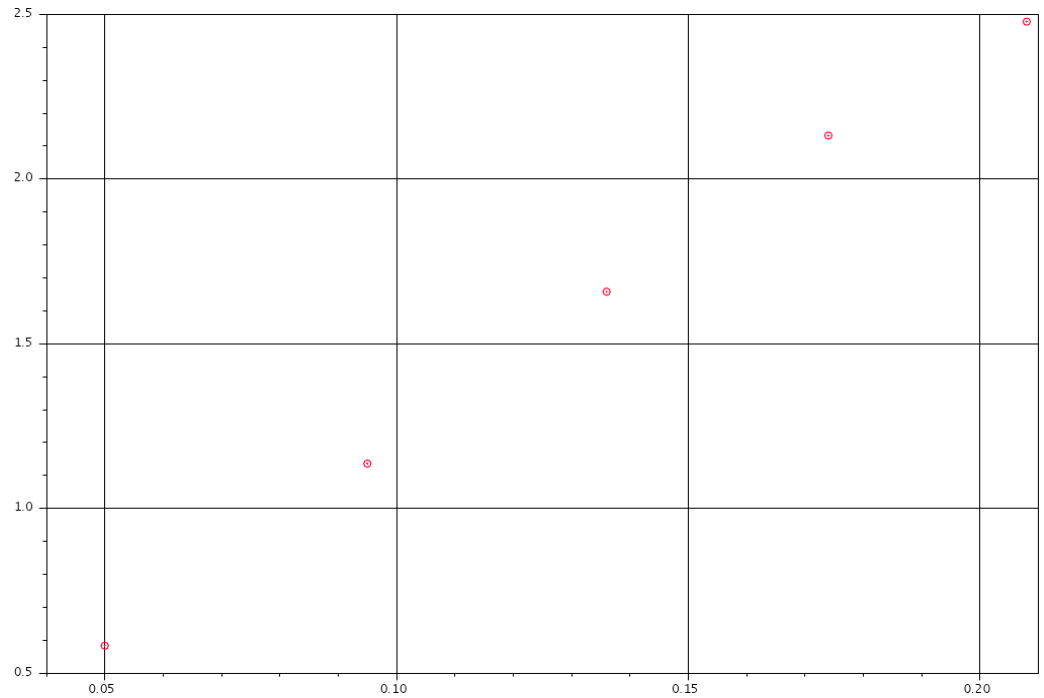
Lab Partner: Hadley Patten

## Abstract

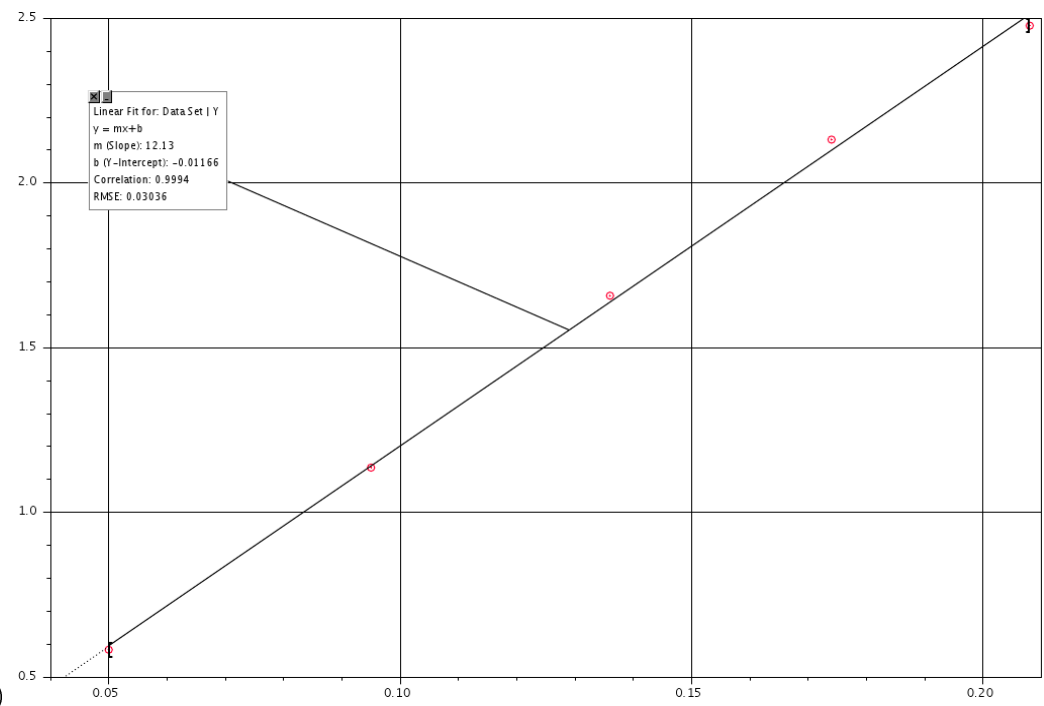
Our lab's purpose was to measure the acceleration due to gravity with relation to tension between a glider and a block in freefall.

## 1 Questions

1.  $x$  was obtained through the formula  $x = x_f - x_i$ ;  $x_f$  and  $x_i$  were obtained by measuring the distance between the photogates.  $x = .657 m$
2. The glider would accelerate significantly before passing through the sensors, thus yielding a different speed result. If the experimenter is not careful to release the glider from the same position, the slope will change.
3. a) Changing the distance between the photogates would not affect the acceleration.  
b) If the string was cut, the glider would stop acceleration and continue to glide to the end of the glide track. The block mass would fall to the ground.



4. a)



b)

c) Slope: 12.13; y-intercept: -.01166

5. The value of the slope should be  $g$ . This is because  $a = \left(\frac{m_2}{m_1+m_2}\right)g$ .
6. a) The slope should get smaller. The acceleration should be lower as well.  
b) Friction would slow down the acceleration and lower the slope.
7. a) The tension in the string should be  $T = mg$ .
8. No, the mass affects the acceleration because  $a = \left(\frac{m_2}{m_1+m_2}\right)g$ .
9. The mass would accelerate faster or slower because it would also be inclined to accelerate due to gravity because of the angle of the table.
10. Acceleration is constant, so it shouldn't matter how fast the block is moving before it goes through the photogates.

## 2 Conclusion

Force is directly proportional to the mass.