The atwood machine lab essay

Objective The objective of this experiment is to study Newton’s Second law of motion utilizing the Atwood Machine and to show that the acceleration is proportional to the force causing the motion. Theory Newton’s second law of motion states that the acceleration of an object is directly proportional to the net force acting on the object and inversely proportional to the total mass. a = net force/ total mass If an object is acted on by a net force , it will experience an acceleration that is equal to the net force divided by the mass.

Because the net force is a vector, the acceleration is also a vector, and the direction of the acceleration moves in the same direction of the net force acting on it. Apparatus Rotary motion sensorThin string Weight hanger and weights Computer PASCO model 700 interface Printer Procedure 1. Verify that the rotary motion sensor is mounted securely and stable. 2. The PASCO model 700 interface must be turned on prior to turning on the computer. .

Make sure the support rod is mounted so that the masses can move freely vertically without swinging. 4. Mount the rotary motion sensor and support rod on the table that have sufficient space for the masses to move up and down on either side of the rotary motion sensor. The axis of the sensor should be horizontal and higher that 1 meter above the floor. 5. Add weights until the load including the mass of the hanger on each side is 200g.

6. Make sure the system machine doesn’t move. 7. In order to avoid negative values of the position x and the velocity v, chose the descending side to be the left side on which you are going to add extra masses.

8. Add extra mass of 12g on the left side and release the system. Repeat this step adding 15g, 17g, and 20g. 9. From the graph that gives the velocity vs.

time, t, calculate the acceleration, a, of the motion using the slopes of the lines. Infer the value of the acceleration due to gravity, g, for each extra mass. 10. Calculate the average of the gravity acceleration, g, and the experimental error. Calculations and results See attached sheet and computer for charts. Was unable to print out graph and table due to printer malfunction is classroom (worked on computer #4 in lab) Conclusion The relation between acceleration and force is a direct relationship and for our system is given by a= 0.

123, 0. 353, 0. 144, 0. 132.