Physics Lab: Work And Friction Essay, Research Paper

Work and Friction Purpose There are two main purposes for this lab. The first is to investigate the concept of work and the second is to investigate the concept of friction. Materials spring balances two blocks (block a and block b) triple beam balance ramp Hall’s carriage Procedure 1 Find the mass of both blocks and transfer into a weight unit. In order to do this procedure we have to use the formula: W=MG. This formula is seen many times throughout this lab. Block A > 315 grams (0.315 kg)(0.315 kg)(9.80m/sX) = 3.09 kgm/sX or 3.09 N Block B > 385.7 grams (0.3857 kg)(0.3875 kg)(9.80m/sX) = 3.78 kgm/sX or 3.78 N Procedure 2 Using a block and a spring balance, record the number of grams needed to move the block and the number of grams to keep the block going. Block A Starting Slidingtry 1 160 g 110 gtry 2 150 g 110 gtry 3 160 g 110 gtry 4 160 g 110 gtry 5 160 g 110 gaverage of 5 tries 158 g 110 gWeight (w=mg) 1.55 N 1.078 N Starting Sliding+ = F/N = 1.55N/3.09N = 0.50 + = F/N = 1.078N/3.09N = 0.348 Block B Starting Slidingtry 1 220 g 120 gtry 2 230 g 130 gtry 3 200 g 120 gtry 4 210 g 125 gtry 5 215 g 120 gaverage of 5 tries 215 g 123 gWeight (w=mg) 2.12 N 1.21 N Starting Sliding+ = F/N = 2.12N/3.78N = 0.56 + = F/N = 1.21N/3.78N = 0.32 Procedure 3 Repeat procedure 2 with a ramp. Block A Starting Slidingtry 1 140 g 90 gtry 2 140 g 80 gtry 3 150 g 90 gtry 4 140 g 90 gaverage of 4 tries 142.5 g 87.5 gWeight (w=mg) 1.397 N 0.858 N Starting Sliding+ = F/N = 1.397N/3.09N = 0.452 + = F/N = 0.858 N/3.09N = 0.278 Block B Starting Slidingtry 1 240 g 110 gtry 2 190 g 110 gtry 3 200 g 110 gtry 4 215 g 115 gtry 5 190 g 110 gaverage of 5 tries 207 g 111 gWeight (w=mg) 2.03 N 1.09 N Starting Sliding+ = F/N = 2.03N/3.78N = 0.537 + = F/N = 1.09N/3.78N = 0.288 Procedure 4 Using Hall’s carriage and spring balance… No reading was observed in moving it along the table. It can be deducted that rolling friction is very small. Procedure 5 Using an inclines plane, find the + (mu > coefficient of friction).

Block A = 23| Weight of Block A = 3.09 N AW = weight 3.09 N sin = 1.21 N (nw = ac; ac = 1.21 N)cos (an) = 3.09N x cos 23 = 2.84 N+ = F/N = 1.21N/2.84N = 0.426 For block B, same image is used with the exception that 23| is 24|. Block B: 24| Weight of Block B = 3.78 N sin cos (an) = 3.78 N x cos 24 = 3.453 N+ = F/N = 1.34N/3.453N = 0.446 Questions1. Describe our lab quantitatively and qualitatively. Quantitatively – Quantitatively deals with numbers. We use numbers in every one of our labs. We found the mass of the two blocks and then converted that to a weight factor. All these were dealing with numbers and units. Also, when we took readings for the starting and sliding we also took mass and transferred it into weight. Our numbers weren’t 100% precise. We had to take the average of all the trials and used those to find the coefficient of friction.Qualitatively – Some of the materials that were used weren’t very good. For example, the blocks of wood were just from a wood pile…they weren’t measured or anything. Also, the ramp that we used was slightly warped which could have caused different answers to be measured. Also, we couldn’t even use the bulldozers because they were broke. 2. Using a mass of 20kg and a coefficient of friction ranging from 0.1 to 1, find the force to overcome friction. W = mg = (20kg)(9.80m/sX) = 196 kgm/sX or 196 N+N = Fcoefficient of friction (+) Normal Force (N) Force to overcome (F)0.1 196 N 19.6 N0.2 196 N 39.2 N0.3 196 N 58.8 N0.4 196 N 78.4 N0.5 196 N 98 N0.6 196 N 117.6 N0.7 196 N 137.6 N0.8 196 N 156.8 N0.9 196 N 176.4 N1.0 196 N 196 N 3. Why do we want high values or low values? You would want a high value for a coefficient of friction if you don’t want it to be slippery…if you want good traction. For example, We put salt on ice so that people won’t slip on it. Putting salt on the ice raises the coefficient of friction.On the other hand, a low value is good for when you don’t want there to be a lot of friction, if you wanted to glide more across a surface. For example, ice, when skating has a low value. If the value was any higher you wouldn’t be able to skate, you’d be falling or not going anywhere. 4. Comment on lab. By doing this lab I learned many things. I learned a few formulas dealing with friction. Also I learned what a coefficient of friction was. I learned what the difference between a high a low coefficient of friction was. I learned what tan meant and also how to find it without just hitting the tan button on my calculator. I learned how to find the coefficient of friction, and by using the formula to find it I can also solve for the force needed to overcome friction.