Name_____

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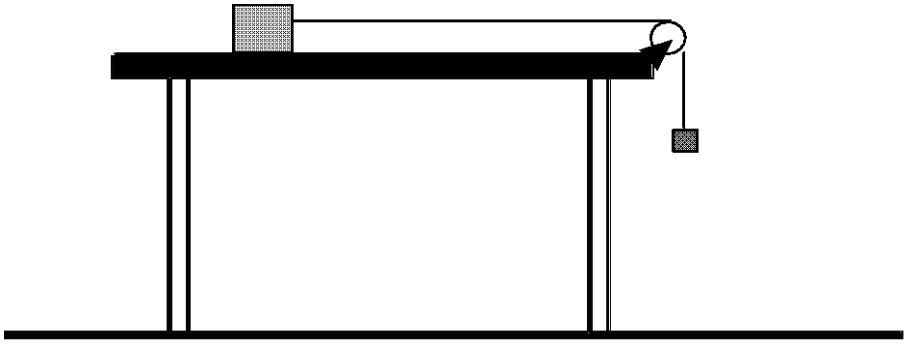
UNIT III: Worksheet 4

1. Suppose a hanging 1.0 kg lab mass is attached to a 4.0 kg block on the table.



   a. If the coefficient of kinetic friction, μ_k is 0.20., calculate the acceleration of the block.

   b. Calculate the minimum value of the coefficient of static friction, μ_s, in order for the block to remain motionless.

2. A block weighing 300 N is moved *at constant speed* over a horizontal surface by a force of 50 N applied parallel to the surface.

   a. Construct a force diagram for the block.

   b. Calculate the coefficient of kinetic friction.

   c. Calculate the acceleration of the block if $\mu_k = 0$.

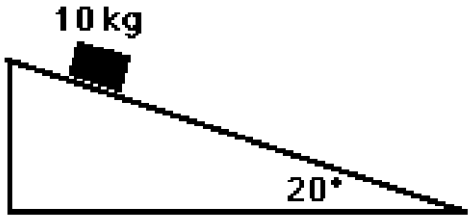
3. A 100 N force is applied to a 50 kg crate resting on a level floor. The coefficient of kinetic friction is 0.15.

   a. Draw a force diagram to represent this situation.

   b. Calculate the acceleration of the crate.

4. In the situation described above, the coefficient of static friction, $\mu_s = 0.25$. Is the 100 N force sufficient to cause the crate to accelerate? Draw a force diagram, then explain why or why not.

5. A 10 kg block is allowed to slide down a ramp with $\mu_k = 0.15$.



   a. Calculate the value of the frictional force opposing the block's slide down the ramp.

   b. Calculate the acceleration of the block.