Name_____

Date _____ **Pd** ____

Net Force Particle Model Worksheet 5:
Newton's Second Law and Friction

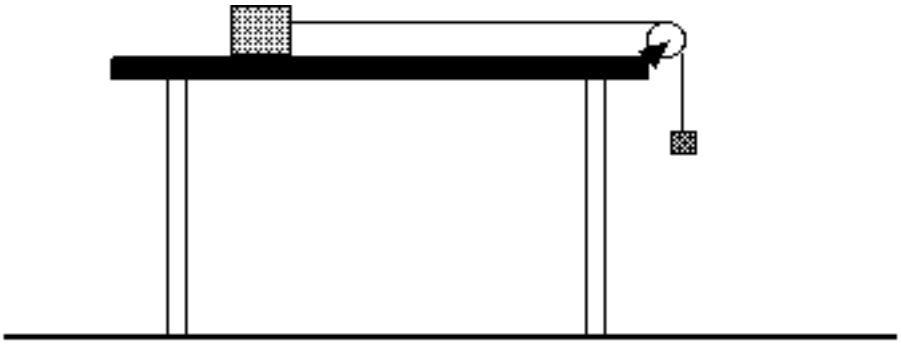
1. A sled weighing 300 N is moved *at constant speed* over a horizontal floor by a force of 50 N applied parallel to the floor.

    a. Construct a force diagram for the sled.

    b. Determine the coefficient of kinetic friction, μ_k, between the sled and the floor.

    c. What would be the acceleration of the sled if $\mu_k = 0$?

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



a. Draw a force diagram for the block on the table.

b. What would be the minimum value of the coefficient of static friction, μ_s, in order for the block to remain motionless?

c. If the coefficient of kinetic friction, μ_k is 0.20, what is the acceleration of the block?

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

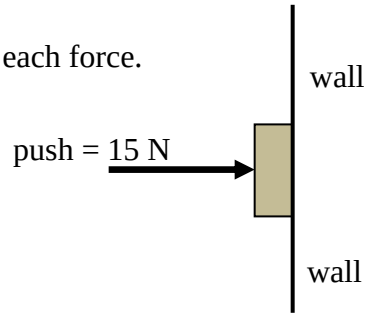
   a. Draw a force diagram to represent this situation.

   b. What is the acceleration of the classmate?

   c. Suppose the classmate in was resting on a carpet where the coefficient of static friction is 0.25. Is the horizontal 100 N force sufficient to cause the classmate to accelerate? Draw a force diagram, and then explain why or why not.

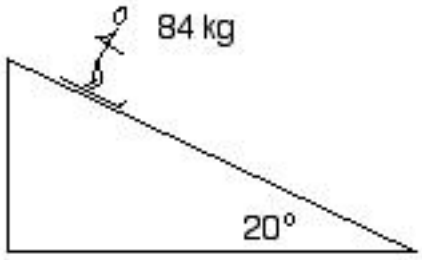
4. When 15 newtons of force is applied to the 0.50 kg book, the friction keeps the book from sliding down the wall.

   a) Make a force drawing for the book. Include the amount of each force.



   b) What is the minimum force and minimum coefficient of friction to keep the book from sliding?

5. An 84 kg skier glides down a hill with $\mu_k = 0.15$.



a. Draw a force diagram for the skier.

b. What is the value of the frictional force opposing the skier's slide down the hill?

c. Calculate the acceleration of the skier.