Name_____ Date_____ Pd_____

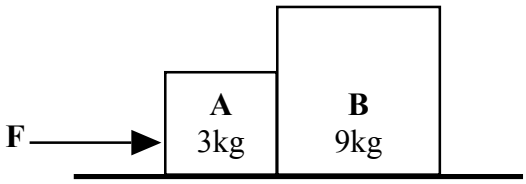
Net Force Particle Model:
Newton's Second Law Review Problems

1. An 80 kg water skier is being pulled by a boat with a force of 220 N causing the skier to accelerate at 1.8 m/s^2. Find the frictional force on the skier.

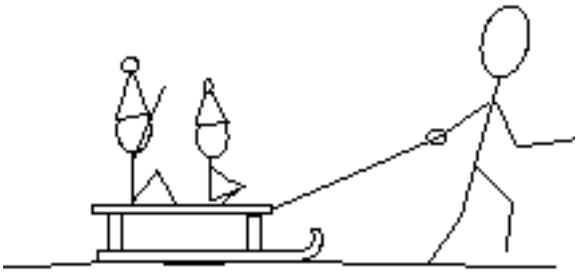
2. A 2000 kg car is slowed down uniformly from 20 m/s to 5 m/s in 4 seconds. Determine the average net force on the car during this time, and how far the car traveled while slowing down.

3. Some baseball pitchers are capable of throwing a fastball at 100 mi/hr. The pitcher achieves this speed by moving his arm through a distance of 1.5 m. Determine the average net force that must be exerted on the 0.15 kg ball during the pitch. (1 mile = 1600 meters)

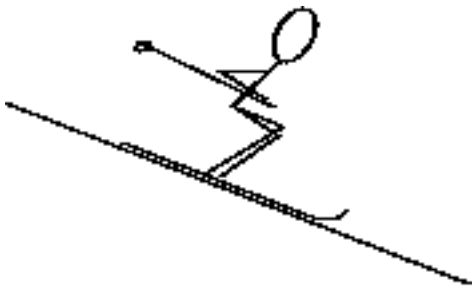
4. The blocks below are moving at a constant velocity of 1m/s. If μ_k=.3 between the surface and each block then determine the following:
   a. the frictional force on each block
   b. the contact forces (F_B on A, F_A on B) on each block
   c. the applied force, **F**.



5. In the diagram below, the cord makes a 25° angle with the horizontal, the mass of the sled and occupants is 100 kg. The tension in the cord is 120 N and the friction force is 15 N. Find the acceleration of the sled.



6. The 60 kg skier shown below is skiing down a 35° incline with a coefficient of friction is 0.08. Determine the acceleration of the skier.



7. A student, standing on a scale in an elevator at rest, sees that his weight is 900 N. As the elevator rises, his weight increases to 1050 N, then returns to normal. When the elevator slows to a stop his weight drops to 700 N, and then returns to normal. Make the positive direction upward.

A. Describe the motion of the elevator in words.

B. Draw a force diagram for each of the following portions of the trip:

a. At rest
b. Moving from rest to constant speed
c. Slowing from a constant speed to rest

C. Determine the acceleration of the elevator, a) when it is speeding up, b) when it is slowing down.