PreAP: due Thurs., Oct 20 (Assigned: Tues., Oct 18)
Reg: due Fri., Oct 21 (Assigned: Wed., Oct 19)

Normal Force 1

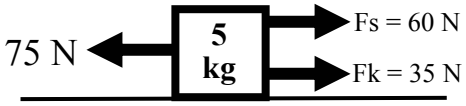
1. At the highest point a projectile stops for an instant. At this point is it at equilibrium? Why or why not?

2. What happens to an object left in the bed of a truck when it accelerates and why?

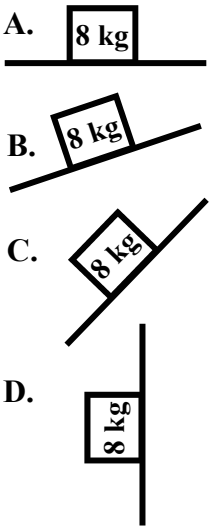
3. In a space ship a container full of dense rock samples is floating.
   A. Does it have mass or weight?
   B. When you push it out of the way will you have to push hard or soft? Why?

   C. What will happen to you when you push on the container?

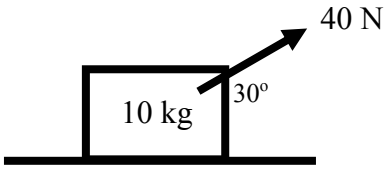
4. Using the object on the right answer the following questions:
   A. Will the object move and why or why not?
   B. How much force is necessary to keep it moving?
   C. Find the weight of the object.
   D. Find the normal force of the surface.
   E. Find μ_s and μ_k for the surface.



5. Using the four mass (A—D) on the right, for the following questions:
   A. Draw the normal force for each. (Remember what "normal" means.)
   B. What is the weight of mass C?
   C. What is the normal force on mass A?
   D. Which one feels the most normal force?
   E. Which one feels no normal force?
   F. Which one feels the second least normal force?
   G. Is the angle of tilt for C greater or less than B?
   H. As the angle of tilt increases does the normal force increase or decrease?
   I. Using your calculator decide if the normal force depends on the sin or cos of the angle.



6. *(Refer to notes: "Friction and Angles" for help.)* A 40 N force pulls at 30o on a 10 kg object. If the surface has a μs of 0.25 and a μk of 0.1. Find the following :
   (**BIG HINT: label and draw on the diagram as you go**!)
   A. What is the y-component of the force?
   B. What is the weight of the object?
   C. Using A and B above, what is the Fn?
   D. Using C, find Fs and Fk.
   E. Which way will friction pull?
   F. What is the x-component of the force?
   G. Using D and F, will the object move?
   H. If it doesn't move how much more force is necessary to move it?
   I. If it does move, find Fnet and the acceleration.



$\mu_s = 0.25$
$\mu_k = 0.1$

7. If a 25 kg object is submersed in water and it only needs 150 N to keep it afloat, how much buoyant force is the water giving the object?

8. On the back.

8. Use the chemical formula at the right to answer the following:

$$4Al_2^{3+}(CrO_4^{2-})_3$$

A. How many molecules of aluminum chromate are there?

B. What is the oxidation number for oxygen?

C. How many Aluminum atoms are there in

1 Aluminum Chromate?

D. How many Chromate (CrO_4) ions are there?

E. How many Oxygen atoms are there total?

F. How many Aluminum atoms are there total?

G. What is the charge on Aluminum?