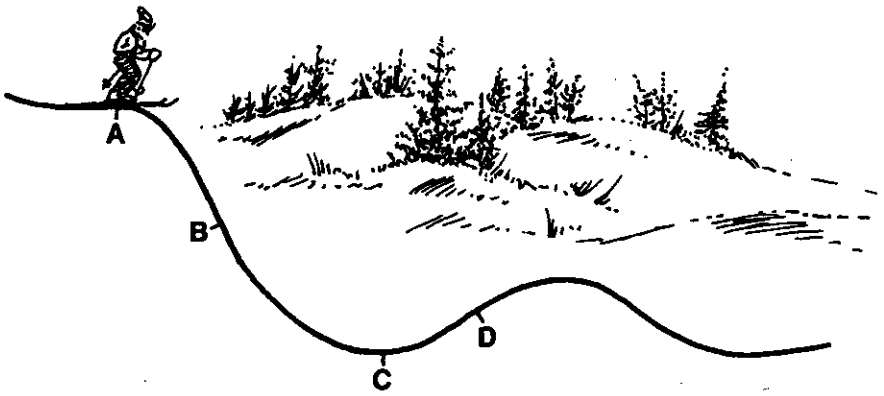
KINETIC AND POTENTIAL ENERGY CHANGES ANSWERS!!

2.



Label the points at which:

__B____The skier is gaining speed

____C__ The point at which the skier is moving the fastest

____A____ The point at which the skier has the greatest amount of potential energy

__B___ The point at which the potential energy is changing to kinetic energy

___C__ The point at which the skier has the greatest amount of kinetic energy

___D_ The point at which kinetic energy is changing to potential energy

Explain why the skier will never return to the height of point A.

Because PE D can never equal PE D, because you will always lose some energy…..

Where and how is mechanical energy "lost?"

You lose the energy because of friction, and it turns into heat.

A tennis ball undergoes several energy changes as it travels towards a player, is struck, and rapidly speeds back over the net. Describe these energy changes using the concepts of kinetic and potential energy. *The ball has all kinetic energy, as it strikes the racket, its energy turns into elastic potential, and then back to kinetic energy again.*

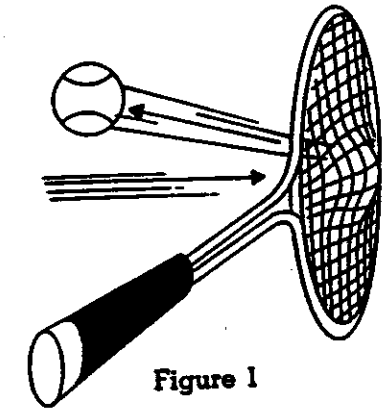
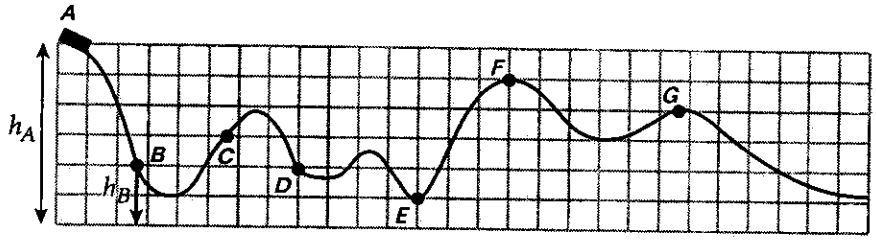


Figure 1

CONSERVATION OF ENERGY DIAGRAM SKILLS



A roller coaster with a mass of m moves along a smooth track as diagrammed in the graph. The car leaves point A with no initial velocity and travels to other points along the track. The zero energy level is taken as the energy of point A.

1a) What is the car's kinetic energy at point A? $KE_A = 0$

b) What is the potential energy associated with the car at point A? $PE_A = mgh_A$

c) What is the car's kinetic energy at point B? $KE_B = PE_A - PE_A = ½\ mv^2$

d) What is the cat's potential energy at point B? $PE_B = mgh_B$

2a) What is the speed of the car at point A? $v_A = 0$

b) What is the speed of the car at point B? $v_B = sqrt(2KE_B/m) = sqrt\ (2(mgh_A - mgh_B)/m)$

3. Assume the mass of the car is 65 kg, and it starts at 30 m above the ground (each square is 5 m). Use the graph above to find the kinetic energy, potential energy, and velocity for points C,D,E<F,G

Location	**KE_A**	**$PE_A = mgh$**	**$KE_{location}$**	**$PE_{location}$**	***V*** **location**
A	*0*	65(9.8)(30)	0	19 110 J	0
B	*0*	19 110 J	19 110-6370=12740 J	65(9.8)10=6370J	19.79
C	*0*	19 110 J	19 110-9555=9555 J	65(9.8)15=9555J	17.1
D	*0*	19 110 J	19 110-6370=12740 J	65(9.8)10=6370J	19.79
E	*0*	19 110 J	19 110-3185=15925J	65(9.8)5=3185J	22.1
F	*0*	19 110 J	19 110-15925=3185 J	65(9.8)25=15925J	9.89
G	*0*	19 110 J	19 110-12740=6370 J	65(9.8)20=12740J	14

4. For each location, what do you notice about the sum of the kinetic and potential energies? *It remains constant….*