Name _____

1. Which of the following energy forms is involved in winding a pocket watch?
   a) electrical energy
   b) gravitational potential energy
   c) non-mechanical energy
   d) elastic potential energy

2. Which of the following forms of mechanical energy is associated with an object due to its position and gravity?
   a) potential
   b) total
   c) positional
   d) kinetic

3. Which of the following forms of mechanical energy is lost by an object that is slowing down?
   a) non-mechanical energy
   b) gravitational potential energy
   c) elastic potential energy
   d) kinetic energy

4. Which of the following is the rate at which energy is transferred?
   a) potential energy
   b) mechanical energy
   c) kinetic energy
   d) power

5. Which of these would most increase the kinetic energy of a moving car?
   a) double the mass of the car
   b) divide the mass of the car by 2
   c) double the speed of the car
   d) divide the speed of the car by 2

6. A cashier pushes a grocery cart 5.0 m with a horizontal force of 50.0 N. How much work is done by the cashier on the grocery cart?
   a) 10 J
   b) 250 J
   c) 1250 J
   d) 55 J

7. A 50 kg pole vaulter clears a bar that is 6.00 m above the ground. With what velocity does the vaulter strike the mat in the landing area?
   a) 2.70 m/s
   b) 10.8 m/s
   c) 5.40 m/s
   d) 21.6 m/s

8. A 125 kg bobsled zips down an ice track starting at a vertical distance of 150 m up the hill. Disregarding friction, what is the velocity of the bobsled at the bottom of the hill?
   a) 27 m/s
   b) 45 m/s
   c) 36 m/s
   d) 54 m/s

9. Water flows over a section of Niagara Falls at a rate of 1.20×10^6 kg/s and falls down a height of 50.0 m. What is the power of the waterfall?
   a) 589 MW
   b) 147 MW
   c) 294 MW
   d) 60.0 MW

Work

10. A girl pulls a wagon along a level path for a distance of 15.0 m. The handle of the wagon makes an angle of 20.0° with the horizontal, and the girl exerts a force of 35.0 N on the handle. Friction provides a force of 24.0 N. Find the net work that is done on the wagon.

11. At the 1996 Summer Olympics in Atlanta, Georgia, a mass of 260 kg was lifted for the first time ever in a clean-and-jerk lift. The lift, performed by Russian weightlifter Andrei Chemerkin, earned him the unofficial title as "the world's strongest man." If Chemerkin did 6210 J of work in exerting a force of 2590 N, how high did he lift the mass?

Kinetic Energy

12. Although ungraceful on land, walruses are fine swimmers. They normally swim at 7 km/h, and for short periods of time are capable of reaching speeds of nearly 35 km/h. If a walrus swimming at a speed of 35.0 km/h has a mass of 900 kg, what is its kinetic energy?

13. Though slow on land, the leatherback turtle holds the record for the fastest water speed of any reptile: 9.78 m/s. It is also among the largest of reptiles. Suppose the largest leatherback yet discovered were to swim at the top leatherback speed. If its kinetic energy was 6.08×10^4 J, what was its mass?

14. The kinetic energy of a golf ball is measured to be 1433 J. If the golf ball has a mass of about 47.0 g, what is the ball's speed?

Potential Energy

15. In 1992, Ukrainian Sergei Bubka used a short pole to jump to a height of 6.13 m. If the maximum potential energy associated with Bubka was 4.80 kJ at the midpoint of his jump, what was his mass?

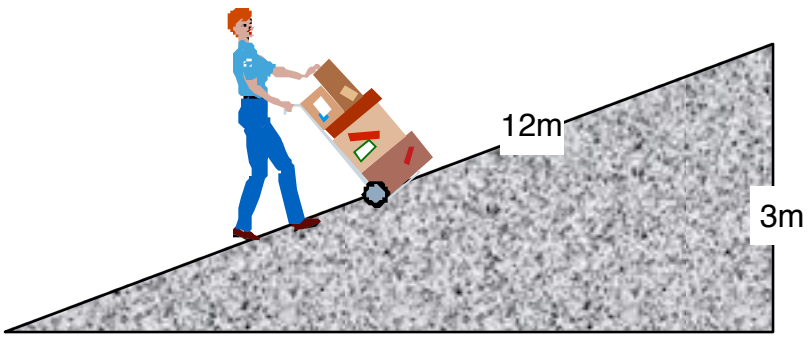
16. Situated 4080 m above sea level, La Paz, Bolivia, is the highest capital in the world. If a car with a mass of 905 kg is driven to La Paz from a location that is 1860 m above sea level, what is the increase in potential energy?

Conservation of Energy

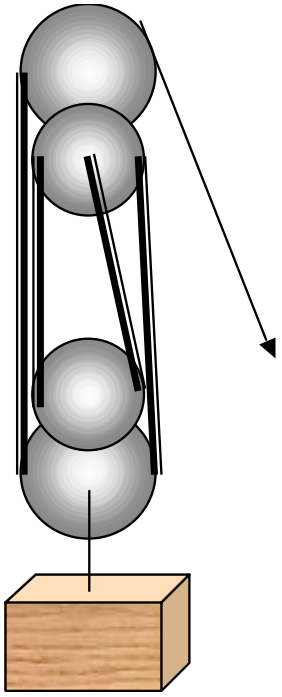
17. In 1989,Michel Menin of France walked on a tightrope suspended under a balloon nearly at an altitude of 3150 m above the ground. Suppose a coin falls from Menin's pocket during his walk. How high above the ground is the coin when its speed is 60.0 m/s?

18. In 1936, Col. Harry Froboess of Switzerland jumped into the ocean from the airship Graf Hindenburg, which was 120 m above the water's surface. Assuming Froboess had a mass of 72.0 kg, what was his kinetic energy at the moment he was 30.0 m from the water's surface? What was his speed at that moment? Neglect the air resistance.

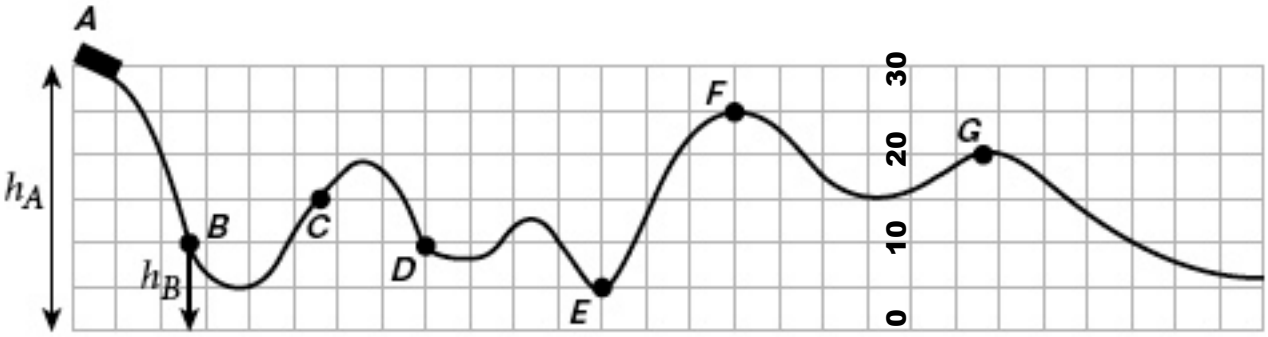
19. Laura can push the 40 kg cart up the 12 m incline with a force of 200 N in 30 seconds. FInd;
    a) the work input
    b) the work output
    c) the IMA
    d) the AMA
    e) the efficiency of the cart
    f) the energy wasted by friction
    g) her power



20. Scott uses a pulley system of four ropes as shown. Scott can lift the 40 N box up 3 m with a force of 20 N in 30 seconds. Find;
    a) How far does he pull?
    b) the work input
    c) the work output
    d) the IMA
    e) the AMA
    f) the efficiency of the cart
    g) his power



21. The rolling car has a mass of 700 kg, and starts from a height of 30 m. Complete the table below.



	Height	PE	KE	TE	V
A	30				8 m/s
B	10				
D	10				
F	25				