 Name ______________________________

From Holt 5A - Work

2. A building under construction requires building materials to be raised to the upper floors by cranes or elevators. An amount of cement is lifted 76.2 m by a crane, which exerts a force on the cement that is slightly larger than the weight of the cement. If the net work done on the cement is 1.31×10^3 J, what is the magnitude of the net force exerted on the cement?

5. A wrench slides off a tilted shelf, although if a force of 1.6 N is applied opposite the wrench's motion the wrench will slide down the shelf with a constant velocity. If the shelf is 1.2 m long, what is the work done by the applied force on the wrench?

6. 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.

10. 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?

From Holt 5B - Kinetic Energy

2. The fastest speed achieved on Earth for any object, with the exception of sub-atomic particles in particle accelerators, is 15.8 km/s. A device at Sandia Laboratories in Albuquerque, New Mexico, uses highly compressed air to accelerate a small metal disk to supersonic speeds. Suppose the disk has a mass of 0.20 g. What is the maximum kinetic energy of the disk?

3. 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?

7. 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?

8. At the time a 55.0 kg skydiver jumps from a plane, her speed steadily increases until air resistance provides a force that balances that due to free-fall. How fast is the skydiver falling if her kinetic energy at the moment is 7.81×10^4 J?

9. 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?

From Holt 5D - Potential Energy

1. 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?

3. In 1966, a special research cannon built in Arizona shot a projectile to a height of 180 km above Earth's surface. The potential energy associated with the projectile when its altitude was 10.0 percent of the maximum height was 1.48×10^7J. What was the projectile's mass? Assume that constant free-fall acceleration at this altitude is the same as at sea level.

8. 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?

From Holt 5E - Conservation of Energy

1. The largest watermelon ever grown had a mass of 118 kg. Suppose this watermelon were exhibited on a platform 5.00 m above the ground. After the exhibition, the watermelon is allowed to slide along to the ground along a smooth ramp. How high above the ground is the watermelon at the moment its kinetic energy is 4.61 kJ?

3. 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?

4. In 1936, Col. Harry Froboess of Switzerland jumped into the ocean from the airship Graf Hindenburg, which was 1.20×10^2 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.

7. Desperado, a roller coaster built in Nevada, has a vertical drop of 68.6 m. The roller coaster is designed so that the speed of the cars at the end of this drop is 35.6 m/s. Assume the cars are at rest at the start of the drop. What percent of the initial mechanical energy is dissipated by friction?

 Name ______________________________

If Laura can push the 40 kg cart up the 12 m incline with a force of 200 N in 30 seconds...
Find; the work input

the work output

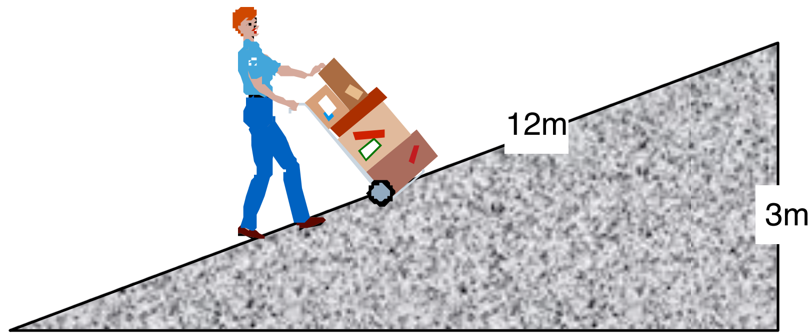
the IMA

the AMA

the efficiency of the cart

the energy wasted by friction

her power



Scott uses a pulley system of four ropes as shown. If Scott can lift the 40 N box up 3 m with a force of 20 N in 30 seconds...
Find; How far does he pull?

the work input

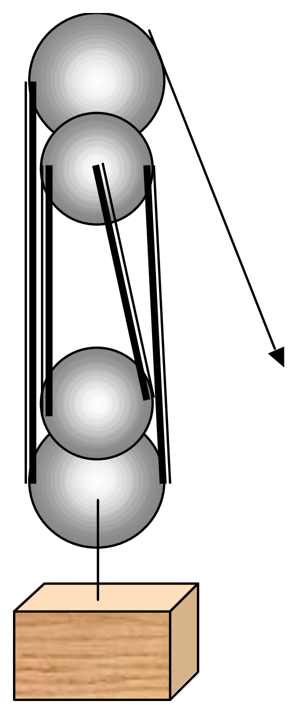
the work output

the IMA

the AMA

the efficiency of the cart

his power



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

3. If the only force acting on an object during a given physical process is friction, which of the following assumptions must be made in regard to the object's kinetic energy?
a. The kinetic energy decreases.
b. The kinetic energy increases.
c. The kinetic energy remains constant.
d. The kinetic energy decreases and then increases.

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

5. Which of the following energy forms is stored in any compressed or stretched object?
a. non-mechanical energy c. gravitational potential energy
b. elastic potential energy d. kinetic energy

7. As an object is lowered into a deep hole in the ground, which of the following assumptions must be made in regard to the object's potential energy?
a. The potential energy increases.
b. The potential energy decreases.
c. The potential energy remains constant.
d. The potential energy increases and then decreases.

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

10. 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

11. A 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

12. A 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

14. 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