

Multiple Choice (please mark the best answer for each question)

- Which has the greatest kinetic energy?
 - A semi-truck ($m = 9000 \text{ kg}$) driving at 2.0 m/s .
 - A Honda Civic ($m = 1000 \text{ kg}$) cruising at 45.0 m/s .
 - They have the same kinetic energy.
 - Not enough information.
- Raising a car in a service station requires energy. Raising it in half the time requires
 - half the power.
 - the same power.
 - twice the power.
 - four times the power.
- The energy due to the position of something is called
 - Kinetic Energy
 - Potential Energy
 - Conservation of Energy
 - All of the above
- What happens to the energy of a book that was sitting on a shelf is placed on a higher shelf than before?
 - Its potential energy increases.
 - Its kinetic energy decreases.
 - Both a. and b. are true.
 - Nothing will happen to its energy.
- If you raise something up twice as high as before, its potential energy is
 - four times as much.
 - half as much.
 - one-fourth as much.
 - twice as much.
- A hailstone falling from a cloud loses _____ and gains _____.
 - kinetic energy, acceleration
 - mass, speed
 - potential energy, kinetic energy
 - acceleration, potential energy
- If an object is at rest, could it still have energy? If an object is moving, must it have energy?
 - yes, yes.
 - yes, no.
 - no, yes.
 - no, no.
- A golf ball's speed increases by a factor of 5, by what factor does its kinetic energy change?
 - 5
 - 10
 - 25
 - 12.5
- The SI unit for Energy is the _____ while the SI unit for Power is the _____.
 - Watt, Joule
 - $\text{N}\cdot\text{s}$, Watt
 - Joule, horsepower
 - Joule, Watt
 - $\text{kg}\cdot\text{m}^2/\text{s}^2$, $\text{kg}\cdot\text{m}^2/\text{s}$
- The SI unit for speed is _____ while the SI unit for mass is _____.
 - m/s , g
 - m/s , kg
 - km/hr , kg
 - km/hr , g

Puzzles (If using a calculator, $g=9.80 \text{ m/s}^2$. If without a calculator, use $g=10.0 \text{ m/s}^2$ and circle this sentence. Please show all your steps and calculations--G.U.E.S.S.)

1. Aaron throws a glob of applesauce straight up at 10.0 m/s . Using the conservation of energy, determine how high the applesauce rises above the point from which it was thrown.

Height =

2. Sasha drops a picture frame from a roof 5.0 meters above the ground. Using the conservation of energy, determine the speed of the frame as it strikes the ground below.

Speed =

3. An enterprising bird swipes one of Carol's cookies as they are cooling on a window sill. But because she used applesauce instead of eggs, the cookie crumbles and falls from the bird's talons. If the bird was travelling at 10.0 m/s at a height of 3.1 m , use the conservation of energy to determine the speed of the cookie crumbles as they hit the ground.

Speed =

4. Daryl's reconstructed 200.0 kg motorcycle can go from 0 to 30.0 m/s in 9.0 s . Determine the final kinetic energy of the motorcycle and the power of the engine.

Kinetic Energy =

Power =