

Honors Physics

4.1 – Work and Energy

Assessment

Don't work too hard on this!

Name: _____

Period: _____

- 1) How much work is done if a force of 12 N moves an object a distance of 5 m?

- 2) If you use a 40 N force to lift a bag, and do 20 J of work, how far did you lift it?

- 3) Express the following amounts of energy in Joules:
 - a. 10 kJ

 - b. 35 MJ

 - c. 0.5 MJ

 - d. 0.2 kJ

- 4) Given that a fully-charged car battery contains 2,000,000 J in electrical energy and that one liter of gasoline contains 35,000,000 J of chemical energy, how many car batteries are needed to store the same amount of one liter of gasoline?

5) Consider the falling apple



- a. Write down three forms of energy the apple has.
- b. Using the energy guide on the right, decide which form of energy you think the apple has the most of.

Typical energy values

kinetic energy of a
football when kicked 50 J

gravitational potential
energy of a skier at the top
of a ski jump 15 000 J

chemical energy in
a chocolate biscuit 300 000 J

kinetic energy of
a car travelling at
70 mph (30 m/s) 500 000 J

thermal energy
needed to boil a
kettleful of water 700 000 J

electrical energy
supplied by a fully
charged car battery 2 000 000 J

chemical energy
in all the food you
eat in one day 11 000 000 J

chemical energy in
one litre of petrol 35 000 000 J

6) A man cleaning his apartment pulls a vacuum cleaner with a force of 50 N at an angle of 30 degrees. A frictional force of magnitude 40 N retards the motion, and the vacuum is pulled a distance of 3 m.

Calculate

a. the work done by the man.

b. the work done by the frictional force.

c. the net work done on the vacuum by all forces acting on it.