Physics 11 – Work and Energy Worksheet

1. Calculate the work done by a 47 N force pushing a pencil 0.26 m.

2. Calculate the work done by a 47 N force pushing a 0.025 kg pencil 0.25 m against a force of 23 N.

3. Calculate the work done by a 2.4 N force pushing a 400 g sandwich across a table 0.75 m wide.

4. How far can a mother push a 20.0 kg baby carriage, using a force of 62 N, if she can only do 2920 J of work?

5. How much work is it to lift a 20 kg sack of potatoes vertically 6.5 m?

6. If a small motor does 520 J of work to move a toy car 260 m, what force does it exert?

7. A girl pushes her little brother on his sled with a force of 300 N for 750 m. How much work is this if the force of friction acting on the sled is (a) 200 N, (b) 300 N?

8. A 75.0 kg man pushes on a 500,000 t wall for 250 s but it does not move. How much work does he do on the wall?

9. A boy on a bicycle drags a wagon full of newspapers at 0.80 m/s for 30 min using a force of 40 N. How much work has the boy done?

10. A coconut falls out of a tree 12.0 m above the ground and hits a bystander 3.00 m tall on the top of the head. It bounces back up 1.50 m before falling to the ground. If the mass of the coconut is 2.00 kg, calculate the potential energy of the coconut relative to the ground at each of the following sites:

    (a) while it is still in the tree,
    (b) when it hits the bystander on the head,
    (c) when it bounces up to its maximum height,
    (d) when it lands on the ground,
    (e) when it rolls into a groundhog hole, and falls 2.50 m to the bottom of the hole.

11. Calculate the kinetic energy of a 45 g golf ball travelling at: (a) 20 m/s, (b) 40 m/s, (c) 60 m/s.

12. When the speed of an object doubles, does its kinetic energy double? Explain your answer.

13. A 50 kg bicyclist on a 10 kg bicycle speeds up from 5.0 m/s to 10 m/s.
    (a) What was the total kinetic energy before accelerating?
    (b) What was the total kinetic energy after accelerating?
    (c) How much work was done to increase the kinetic energy of the bicyclist?

14. A force of 5.0 N moves a 6.0 kg object along a rough floor at a constant speed of 2.5 m/s.
    (a) How much work is done in 25 s.?
    (b) What force of friction is acting on the object?

15. A big box of sausages (30 kg) is lifted from the ground to the top shelf of the freezer. If the box is ifted at a constant speed, a distance of 1.75 m, what work is done against gravity?