Conceptual Physics
Chapter 8 Review

Name: _____
Period: _____ Date: _____

1. Force x distance = _____

2. Trixie is pushing against an enormous boulder with a force of 450 N. She pushes for five minutes until the sweat is dripping from her forehead. The rock does not move. Keeping in mind how work is defined, how much work does Trixie do in those five minutes?

3. Nate lifts a 10 kg mass up onto a table that is 1 m tall.
   a) How much force is required to lift the 10 kg mass?

   b) How much work does Nate do?

4. Derek lifts a 5 kg mass up onto a shelf that is 2 m tall.
   a) How much force is required to lift the 5 kg mass?

   b) How much work does Derek do?

5. Work, according to your textbook, generally falls into two categories. Describe these two categories.

6. What is the unit of measurement for work?

7. Wally puts 10 bricks up onto a 2 meter tall platform. Each brick has a mass of 2 kg. This task takes him 20 seconds to perform.
   a) How much force must Wally exert to lift each brick?

   b) How much work is required to lift each brick onto the platform?

   c) What is Wally's power output?

8. Sally puts 10 bricks up onto a 2 meter tall platform. Each brick has a mass of 2 kg. This task takes her 10 seconds to perform.
   a) How much force must Sally exert to lift each brick?

   b) How much work is required to lift each brick onto the platform?

c) What is Sally's power output?

9. _____ is the ability to do work.

10. The unit used to measure energy and work is the _____.

11. Give three specific examples of an object, which has potential energy.

12. Jack lifts a 10 kg pile of books onto a 2 m tall shelf.
a) How much force is needed to lift the books?

b) How much work does Jack do when he lifts the books to the top of the shelf?

c) How much potential energy do the 10 kg of books have when they are up on the 2 m tall shelf compared to the potential energy they had when they were on the floor?

13. James has a mass of 80 kg. He is standing on top of a 20 meter high look out tower. How much potential energy does he have relative to the ground?

14. a) How much power is required to do 100 joules of work on an object in 0.5 seconds?

b) How much power is required to do 100 joules of work on an object in 1.0 seconds?

15. What two variables determine the kinetic energy of an object?

16. Trixie has a mass of 60 kg, and she is walking at 2 m/s. Dusty has a mass of 60 kg, and she is running at 4 m/s.
a) What is Trixie's kinetic energy?

b) What is Dusty's kinetic energy?

c) Trixie and Dusty have the same mass. Dusty's velocity is twice as great as Trixie's. How much greater is Dusty's kinetic energy than Trixie's?

17. In your own words, state the Law of Conservation of Energy.

18. Wally does 100 joules of work pulling an arrow back in a bow. He then aims the arrow straight up in the air.
    a) How much potential energy is stored in the bow when it is pulled all the way back?

    b)
    c) When Wally releases the arrow, how much kinetic energy will it have when it leaves the bow?

    d) The arrow flies straight up. At its highest point:
        1) how much potential energy will it have?

        2) how much kinetic energy will the arrow have?

19. Trixie is standing on top of a 20 m tall platform preparing to jump into a large vat of lime jello. Trixie's mass is 60 kg.
    a) How much potential energy does Trixie have compared to the bottom of the platform?

    b) When she has stepped off of the platform and is falling towards the jello, how much potential energy does she have when she is halfway down?

    c) How much kinetic energy does she have when she is halfway down?

    d) How much kinetic energy does she have when she reaches the jello?

20. Shirley rolls a bowling ball down a long smooth horizontal hallway. The mass of the bowling ball is 2 kg, and the velocity of the ball when it leaves his hand is 3 m/s.
    a) How much kinetic energy does the ball have when it leaves Shirley's hand?

    b) After traveling for 75 m with a steadily declining speed, the ball stops. What has happened to all of the kinetic energy that the ball had?

21. What is a machine?

22. Does a machine allow you to accomplish more work with less work input?

23. What Law of Physics prevents a machine from multiplying work or energy?

24. Natasha is using a lever to lift a large basket of moldy earthworms. She pushes with a force of 20 N on her end of the lever and she moves her end of the lever down a distance of 20 cm. The basket of worms rises a distance of 5 cm. Assume that this is an ideal lever (that is, assume there is no friction).
    a) How much work does Natasha do on her end of the lever?

    b) How much work does the other end of the lever do on the basket of worms?

    c) What is the weight of the basket of worms?

    d) What is the mechanical advantage of the lever?

25. Rocky is using a pulley system to lift a large stone off of his foot. The stone weighs 40 N. Rocky pulls his end of the rope down 30 cm and the stone moves up 30 cm. Assume that the pulley is ideal (that is, assume there is no friction).
    a) How much work does the rope do on the 40 N stone when lifting it 30 cm?

    b) How much work does Rocky do on his end of the rope?

    c) How much force does Rocky exert on his end of the rope?

    d) What is the mechanical advantage of the pulley?

26. Felicia is using a pulley system to lift a block of cement. The block of cement weighs 100 N. Felicia pulls down on her end of the rope a distance of 50 cm and the block is raised a distance of 25 cm. Assume that the pulley is ideal (that is, assume there is no friction).
    a) How much work does the rope do in lifting the 100 N block of cement a distance of 25 cm?

    b) How much work does Felicia do on her end of the rope?

    c) How much force does Felicia exert on her end of the rope?

    d) What is the mechanical advantage of the pulley system?