Name: _____ _____/ 19

Chapter 7.2 Homework
Conceptual Physics Parent Signature: _____

Reviewing Concepts

7. List five types of simple machines. (1)

a.
b.
c.
d.
e.

8. Which two types of simple machines are in a wheelbarrow? (1)

9. A certain lever has a mechanical advantage of 2. How does the lever's output force compare to the input force? (1)

10. Can simple machines multiply input forces to get increased output forces? Can they multiply work input to increase the work output? (1)

11. Draw a diagram of each of the three types of levers. Label the input force, the output force, and the fulcrum of each. (1.5)

12. You and a friend pull on opposite ends of a rope You each pull with a force of 10 N. What is the tension of the rope? (0.5)

13. A pulley system has four strands of rope supporting the load. What is its mechanical advantage? (0.5)

14. A screw is very similar to which other type of simple machine? (0.5)

Solving Problems

9. A lever has an input force of 5 N and an output force of 15 N. What is the mechanical advantage of the lever? (0.5)

10. A simple machine has a mechanical advantage of 5. If the output force is 10 N, what is the input force? (1)

11. You use a rope and pulley system with a mechanical advantage of 5. How big an output load can you lift with an input force of 200N? (1)

12. A lever has an input arm 50 cm long and an output arm 20 cm long. (1)

a. What is the mechanical advantage of the lever?

b. If the input force is 100 N, what is the output force?

13. You want to use a lever to lift a 2,000 N rock. The maximum force you can exert is 500 N. Draw a lever that will allow you to lift the rock. Label the input force, output force, fulcrum, input arm, and output arm. Specify measurements for the input and output arms. State the mechanical advantage of your lever. (2)

14. A rope and pulley system is used so that a 20-N force can lift a 60-N weight. What is the minimum number of ropes in the system that must support the weight? (1)

15. A rope and pulley system has two ropes supporting the load.

a. Draw a diagram of the pulley system. (1)

b. What is the mechanical advantage? (0.5)

c. What is the relationship between the input force and the output force? (0.5)

d. How much can you lift with an input force of 20 N? (0.5)

16. You push a heavy car weighing 500 N up a ramp. At the top of the ramp, it is 2 m higher than it was initially. (1)

a. How much work did you do on the car?

b. If your input force on the car was 200N, how long is the ramp?

17. A lever is used to lift a heavy rock that weighs 1,000 N. When a 50 N force pushes one end of the lever down 1 m, how far does the load rise? (See illustration on page 190.) (1)

18. A system of pulleys is used to lift an elevator that weighs 3,000 N. The pulley system uses three ropes to support the load. How far would 12,000 J of input work lift the elevator? Assume the pulley system is frictionless. (1)