Name _____ JMJ Date _____
Period _____ Miss Pisciotta

Chapter 3 Packet

Lesson 1

HW #1

1) In science, when is work done?
2) What is the equation for determining the amount of work that has been done on an object?
3) What is the SI unit of work and energy, and what is it equal to?
4) What is the force required to lift an object equal to?
5) What does work transfer to an object?

HW #2

1) A student pushes a box 5.0 m across the floor using a constant force of 20.0 N. How much work does the student do on the box?
2) Eli lifts his little brother 1.0 m off the ground using a constant force of 15.5 N. How much work does Eli do?
3) Mary applies a constant force of 25 N as she pushes a desk. In total, she does 75 J of work. How far does she push the desk?
4) A student does 120 J of work pushing a box 6 m across the floor. What force did the student apply?
5) Sam lifts a brick weighing 10 N from the ground and places it on a ledge 1.5 m high. How much work has Sam done on the brick?
6) Tara pushes a 140 N chair 12 m across the basement floor. How much work has been performed on the chair?
7) Eric pulls a sled 25 m through the snow. The sled weighs 200 N. How much work has Eric done on the sled?

HW #3

1) What is power?
2) What is the equation of power?
3) What is the SI unit for power, and what is it equal to?

HW #4

1) Joes does 12 J of work in 2 seconds as he lifts a box off the floor. How much power does Joel use on the box?
2) Sasha does 15 J of work in 4 seconds as she lifts a chair off the floor. How much power does Sasha use on the chair?
3) A student pushes a box across the floor, using 9 W of power in 6 seconds. How much work does the student do?
4) Kyle pushes a chair across the room, using 9 W of power to do 45 J of work. How much time does it take him to push the chair?
5) A task lasted 40 seconds and required 2,000 J of work to complete. How much power was used?
6) How much power is required to do 1,500 J of work in 60 seconds?
7) How much power is expended doing 1,800 J of work in 1 minute?

Lesson 2

HW #5

1) What are three ways that machines can make work easier?
2) Which kinds of materials are often used on machine parts to reduce friction?
3) A machine makes a particular task easier, but it does not _____ the amount of _____ required.
4) The ____ that a machine performs is a product of the _____ and the _____ over which it acts.
5) A machine's _____ is the ratio of the _____ to the _____, and it can be 1, more than 1, or less than 1.
6) A machine's _____ is a ratio of the _____ to the _____, and it is always less than 100 percent because of _____.

HW #6

1) Not all machines use electricity, gasoline, or other forms of chemical energy. You use a machine when you brush your teeth or turn on a faucet. What is a machine?
2) A machine makes work easier by changing the size or direction of the input force, or the distance over which a force acts. How is input force related to input work?
3) Some machines, such as screwdriver, decrease the input force. If you tried to turn a tight screw with just your fingers, it would take a large amount of force. If you use a screwdriver, you would make use of the screwdriver's mechanical advantage. What is mechanical advantage?
4) Friction prevents the amount of output work from ever being greater than the amount of input work. If you reduce the amount of friction, you will improve the efficiency of the machine. Would you expect a well-lubricated machine to have 100 percent efficiency? Explain your answer.

Lesson 3

HW #7

1) What is a simple machine, and what are the six types of simple machines?
2) Which factors determine whether a lever is first-class lever, second-class lever, or third-class lever?
3) What is a compound machine?
4) How does the input force applied by a large gear change when the force is applied to a smaller gear?
5) What happens to the efficiency of the overall machine as more simple machines are added to it?
6) How can gears change the size and direction of a force?