Full Name_____Teacher_____Period_____Date_____

WORK and MACHINES NOTES

1. Work is done when a force that is applied to an object **MOVES** that object.

2. According to that definition, put an **X** in the blank where work is done.
   _____Sitting and looking at a computer screen

   X_____Applying a force to the keys on a keyboard causing them to move

   _____Sitting in the car on the way to school

   X_____The car moving on the way to school

3. You have to exert a force and move something in the **SAME** direction as the force to qualify as doing work.

4. Work is calculated by using the formula: **FORCE x DISTANCE**

4a. The unit for work is the **JOULE**

5. The **HEAVIER** the object the more work needed to move the object the same distance.

6. If you try to move the same object a longer distance, more **WORK** is needed.

7. A **SIMPLE MACHINE** is a device that has one or two parts which you can use to make work easier or more effective.

8. A machine does **NOT** decrease the amount of work that is done, but makes the work easier by:

   -Increasing the amount of **FORCE** exerted to move the object, OR

   -Increasing the **DISTANCE** over which you exert the force, OR

   -CHANGING the **DIRECTION** in which you exert your force.

9. The force you apply to the simple machine is called the **INPUT** force.

10. The machine does work by exerting a force on the object over a distance. The force exerted by the machine on the object to be moved is the **OUTPUT** force.

11. A machine's **MECHANICAL ADVANTAGE** is a ratio of the output force to the input force. It indicates how much the simple machine changes the input force (the force you apply to it.)

$$\text{Mechanical Advantage} = \frac{\text{Output Force}}{\textbf{INPUT} \text{ Force}}$$

12. For a machine that increases the force, the mechanical advantage is **GREATER** than 1. (ex: can opener)

MECHANICAL ADVANTAGE

13. For a machine that increases distance, the ~~output force~~ is **LESS** than 1, which means that a lesser force is exerted by the machine, but over a longer distance.(ex: bike gears)

14. If only the direction changes, the input force will be the **SAME** as the output force. (ex: raising a sail)

15. Some machines allow you to use **LESS** force over a greater distance, more force over a **SHORTER** distance, or the same force in a **DIFFERENT** direction.

16. In the end, you do as much work with the machine as you do without the machine, but the work is **EASIER.**

17. There are **SIX** types of machines that make work easier. They are called

SIMPLE Machines. The six simple machines are:

WEDGE   WHEEL & AXLE   SCREW   LEVER

* INCLINED PLANE   * RAMP

*Note: These two simple machines are our focus this year.

_____18. Read pages 194 – 198 in your textbook. Fill in the graphic organizer on page 198.