Assignment: 3

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Hour:\_\_\_

**Introduction to Simple Machines**

1. Draw and label examples of all three types of levers. Label the fulcrum, input arm (where you apply force) and the output arm (where the lever increases or decreases your force).
2. How do wheel and axles move when a force is applied? Draw what this looks like.
3. What does a pulley do to the direction of the force you apply?
4. What is special about a moveable pulley? What is the advantage of using a moveable pulley?
5. What is the advantage of using an inclined plane?
6. What can wedges be used for?
7. What type of simple machine is a screw?

**Work and Power Review**

1. What is work in physics?

1. What is work measured in for the metric system?
2. What does power involve that work does not?
3. The majority of the energy we use to fuel things comes from stored energy called \_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_.
4. What is the law of conservation of energy?

**Efficiency of Machines**

**Efficiency of Machines:** All machines \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_ work/energy than is \_\_\_\_\_\_\_\_\_ into \_\_\_\_\_\_\_\_\_. Comparing the work put out to the work/energy put in to the machines produces an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ rating. It will \_\_\_\_\_\_\_\_\_\_\_\_\_ be \_\_\_\_\_\_\_\_ than \_\_\_\_\_\_\_\_\_%.

**Efficiency** =

**Efficiency Practice Problems: NO WORK = NO CREDIT!**

1. Nelly expends 100 J of work to move a box of his hit CDs up a ramp into his SUV. The amount of work produced is 80 J. What is the efficiency of this process?

1. Ms. Pilarz is trying to impress Bill Nye with her energy efficiency skills and takes a box weighing 100 N and pushes it up an inclined plane that is 5 meters long. It takes a force of 75 Newton’s to push it to the top, which has a height of 3 meters. Hint: you need to solve for work input AND output before you can use the efficiency equation!

1. Blake Shelton is bailing hay with a lever on his farm. He applied 60 N of force and moves the lever 1 meter. This moves a 200 N bale of hay at the other end by 0.2 meters. How efficient is the process using a lever?

1. Mr. Rogers is pulling his friend Mr. McFeely up a ramp in a wagon. Mr. Rogers exerts a force of 25 N to go up the ramp that is 10 meters long. The weight of Mr. McFeely and the wagon is 60 N and the height of the ramp is 3 meters. What is the efficiency?

1. Taylor Swift pushes a lever down 2 meters with a force of 75 N. The box at the other end with a weight of 50N moves up 2.5 meters. What is the efficiency?

1. The Walking Dead uses a pulley system on its fence doors. The pulley system operates with 40% efficiency. If the work put in its 200 joules, how much work is produced?

Assignment: 4  
Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Hour:\_\_\_  
  
**Simple Machines**

Machine Can…



Machines Can’t…



We use simple machines because of their….  
**Mechanical Advantage -**

**Levers:**

1st Class: 2nd Class: 3rd Class:

**Example: Example: Example:**

**Mechanical Advantage Calculation for Levers:**

**Practice Problems with Levers:**





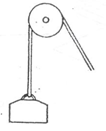


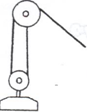


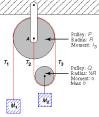
**Pulley:**

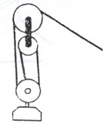
**Examples:**

**Mechanical Advantage Calculation for Pulleys:**

**Practice Problems with Pulleys:**

1. 

[](http://images.google.com/imgres?imgurl=http://www.physics.csbsju.edu/twk/examples/pulley.gif&imgrefurl=http://www.physics.csbsju.edu/cgi-bin/twk/examples/G2.html&h=356&w=302&sz=5&tbnid=bbwH_ZXCpo1aDM:&tbnh=117&tbnw=99&hl=en&start=5&prev=/images%3Fq%3Dpulley%26svnum%3D10%26hl%3Den%26lr%3D%26sa%3DG)

3. 

**Wheel and Axle:**

**Examples:**

**Mechanical Advantage Calculation for Wheel and Axle:**

**Practice Problems with Wheel and Axles:**












**Inclined Plane:**

**Examples:**

**Mechanical Advantage Calculation for Inclined Planes:**

**Practice Problems with Inclined Planes:**












**Compound Machine:**

**Examples -**