

## Simple Machines–Levers: Objectives and Vocabulary

By referring to the various handouts, notes, lab activities and homework covered during this unit, then at the end of this unit of study, each student should be able to:

1. Described the 2 basic ways that machines make work easier.
2. Name and describe the 6 basic types of simple machines which are grouped into 2 families of machines, the lever family, and the inclined plane family.
3. Explain what determines if a machine is to classified as a simple or a compound machine.
4. Calculate work using the formula  $W = F \times D$ , and correctly use the metric units of work, Joules(J).
5. Calculate work input as well as work output.
6. Describe why in the real world the work input for a machine can never be equal to the work output.
7. Describe the ways friction can be reduced for a typical machine.
8. Describe what an ideal machine is and under what conditions it is assumed to operate.
9. Calculate mechanical advantage (MA) using the formula  $MA = \text{resistance force} \div \text{effort force}$ .
10. Depending on the type of simple machine being used know how to determine the Ideal Mechanical Advantage (IMA).
11. Define and calculate torque using the formula  $F_t = F \times D$ .
12. Know what the Law of Levers is and how to apply it when making a lever balance.
13. Describe the way many hand tools are designed to produce more torque.
14. Identify and describe the three types of lever classes, and give examples of each.

### Vocabulary:

Simple Machine	Inclined Plane	Ideal Machine
Lever Family	Screw	Mechanical Advantage (MA)
Inclined Plane Family	Wedge	Ideal Mechanical Advantage (IMA)
Lever	Work	Law of Levers
Wheel and Axle	Joules (J)	First Class Lever
Pulley	Work input	Second Class Lever
	Work output	Third Class Lever