
Simple Machine Investigation



Introduction

Greek mathematician, physicist, astronomer, and engineer Archimedes boasted, “Give me a place to stand, and with a lever I will move the whole world.” Archimedes never moved the world, but he did change the world through the development of simple machine mechanisms.

In this activity you will explore the function and characteristics of the simple machines and you will see firsthand how simple machines manipulate energy to create a desired output.

Procedure

For each of the separate parts of this activity you will:

- I. **Build:**
Follow the *Instructions for Building your Simple Machine Device* to build the simple machine.

- II. **Measure:**
After you have constructed the simple machine measure the values you need in order to calculate both the Ideal and Actual Mechanical Advantage.
 - a. D_E is the distance over which the effort force is applied.
 - b. D_R is the distance over which the resistance force is applied.
 - c. The **Effort (F_E)** is the force that you apply to the system.
 - d. The **Resistance (F_R)** is the force or load that you are manipulating.

- III. **Calculate:**
Using the collected data you will complete the requested calculations. For the calculations,
 - a. First, write down the formula you plan to use without putting numbers in it.
 - b. Then, on a separate line, please substitute in your numbers with units.
 - c. Finally, simplify your calculations to arrive at your final answer with units.

IMPORTANT NOTE:

Be as accurate as possible in your
measurements
and
documentation!!!!!!

Part 0 – Measuring Your Known Resistance Force

1. From your instructor obtain the object that will be used to create the resistance force for the simple machines.
2. Zero out your force sensor in the vertical orientation
3. Suspend your object from the force sensor in order to measure the magnitude of the actual resistance force. Record your measurement here.

F_R : _____

You will use this same resistance force for all of your simple machines except the Screw. When you complete data collection for the Screw this will be the value of your actual effort force.