

## Grinding Gears!

Remember 'dem pulleys? Remember how we used more and more pulleys to reduce the amount of force required to move a given mass. Recall also that we had a price to pay....we needed to pull a lot more rope to move the mass. Well, today we are going to look at another trade off simple machine.....Wheels! In this case, we are going to be looking at very special wheels. Wheels with notches that interlock. Wheels that are called.....Drum roll please.....

# Gears!

Today's goal is to see how the size of gear and the number of teeth affect the force and speed into and out of a gear system.

### Definitions:

**Driving Gear:** The gear on which the input force acts. (the one with the handle)

**Driven Gear:** The gear or gears which are acted upon by the Driving Gear

### Lab1: Just the facts

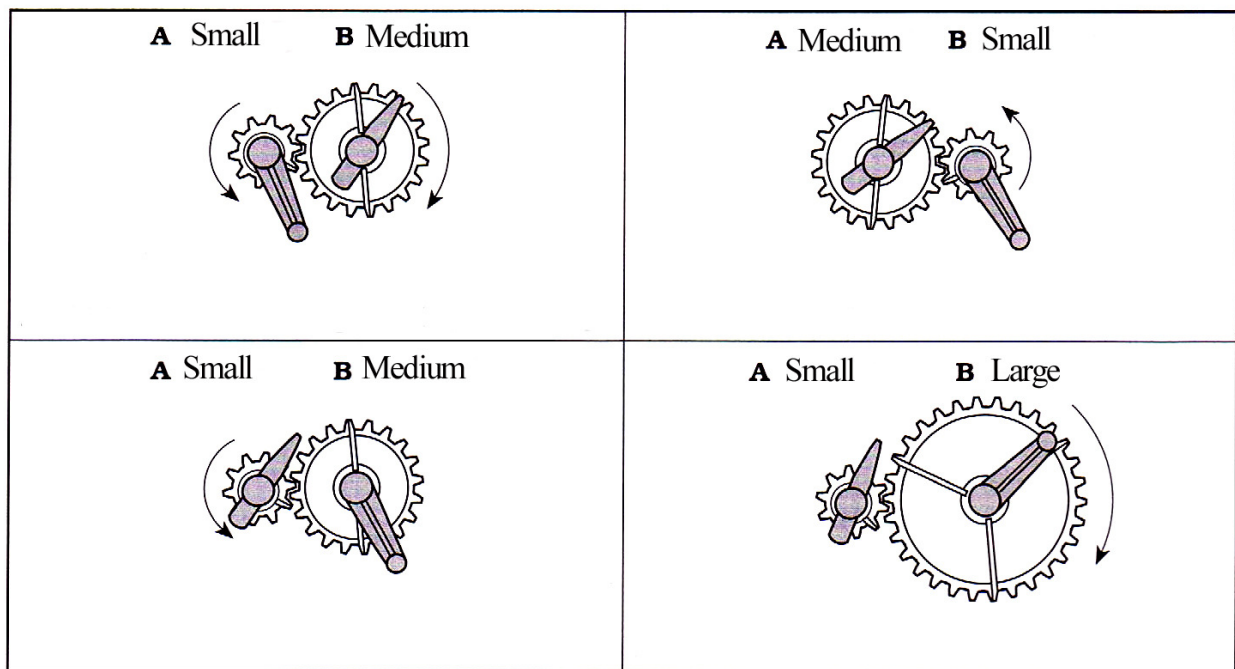
First we need to simply describe each of the three gears you will be working with.

**In your lab book record the number of teeth on the small gear, medium gear and large gear.**

### Lab2: Two gear arrangements

In this case, you are going to need to set up four different arrangements. Each arrangement will have two gears, one handle and one pointer. Place the gears in the support frame as shown below and **record and illustrate in your notebook** the data for each arrangement. In each case you will need to assign:

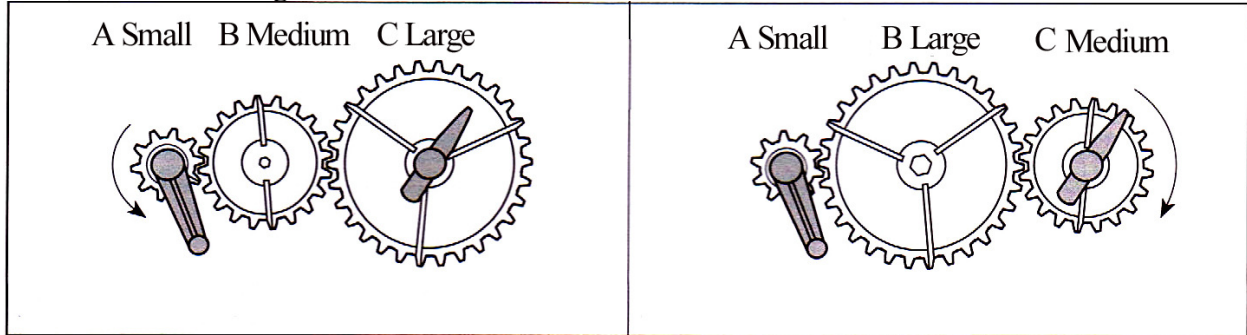
- 1) **The driving gear and the driven gear**
- 2) **The derived gear ratio.**



### Lab3: Three gear arrangements

In this case, you are going to need to set up two different arrangements. Each arrangement will have three gears, one handle and one pointer. Place the gears in the support frame as shown below and **record and illustrate in your notebook** the data for each arrangement. In each case you will need to assign:

- 3) **The driving gear and the driven gear**
- 4) **The derived gear ratio.**



### Lab4: Whatever gear arrangements

I was able to make two different configurations of gear trains that allowed me to create a 6:1 ratio, Can you find at least one of them? **Record and illustrate in your notebook** the data for each arrangement.

**BIG HINT!**

You may need to stack one gear on top of another.