



Serrata Gears and Lever Set

Cat No. 1211009

Introduction:

Gears and Lever set has been designed as a low cost demonstration set to show the inter relationship of gears and levers, principles and mechanical advantages.

It provides an introduction to ratios, torques and simple machines. Multiple sets can be combined to build more sophisticated machines.

Parts List:

- 3 Gears
- Stand
- 2 Levers
- Nuts and Bolts

Simple masses needed for use with the levers.

Attaching Stand and Rod:

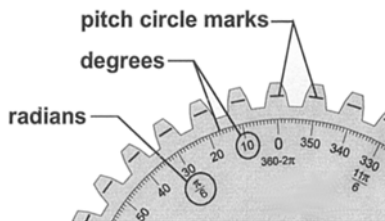
Start by attaching the support rod (hollow slotted square aluminium post 1200 mm) to the base triangular stand with the hardware supplied.

To set-Up the Gears:

Fulcrum bolts and wing nuts are provided to allow attachment of the gears to the slotted support rod.

A certain amount of adjusting will be required to ensure the gears mesh and turn freely in relation to each other.

Please note: The gears should rotate freely and not bind. However due to the large size and design of the gear teeth, adjustment to obtain correct mesh is quite simple and achieved by moving the attachment bolts up or down and retightening with the wing nuts. You can use one, two or three gears.

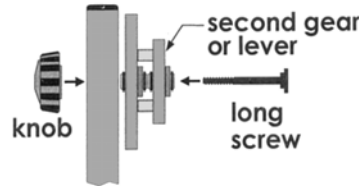


You can use the rod as a reference to show the angle for each gear as they are rotated.

The markings printed on each gear allow mathematical concepts such as angles, circles etc... to be taught.

Experimentation will show how gearing operates and with the data printed on the gears, calculations can be made to determine mechanical advantages, rates of rotation and the effects of adding or removing a gear or gears.

To set-Up the Levers:



The levers are similarly attached and may be used separately with masses or in concert with the gears.

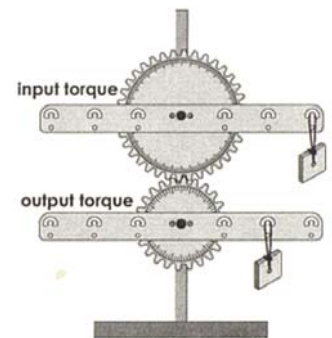
They can demonstrate that the torque transmitted through a gear train is related to the gear ratio.

Additional studies of the effects of centre of gravity, mass balance and inter relation with gear rotation are possible.

Handling and Storage:

It is advisable to store the unit either assembled or disassembled but in a manner where damage is unlikely.

The set is finished with clear polyurethane and can be wiped clean with a damp sponge cloth.



Suggested Investigations and/or Studies:

1. Designing and building of complex gear machines and calculations of gear ratios.
2. Equilibrium principles and the three types of levers.
3. Torque in rotating machines, mechanical advantage and simple machines.
4. Centre of gravity and rotational equilibrium.