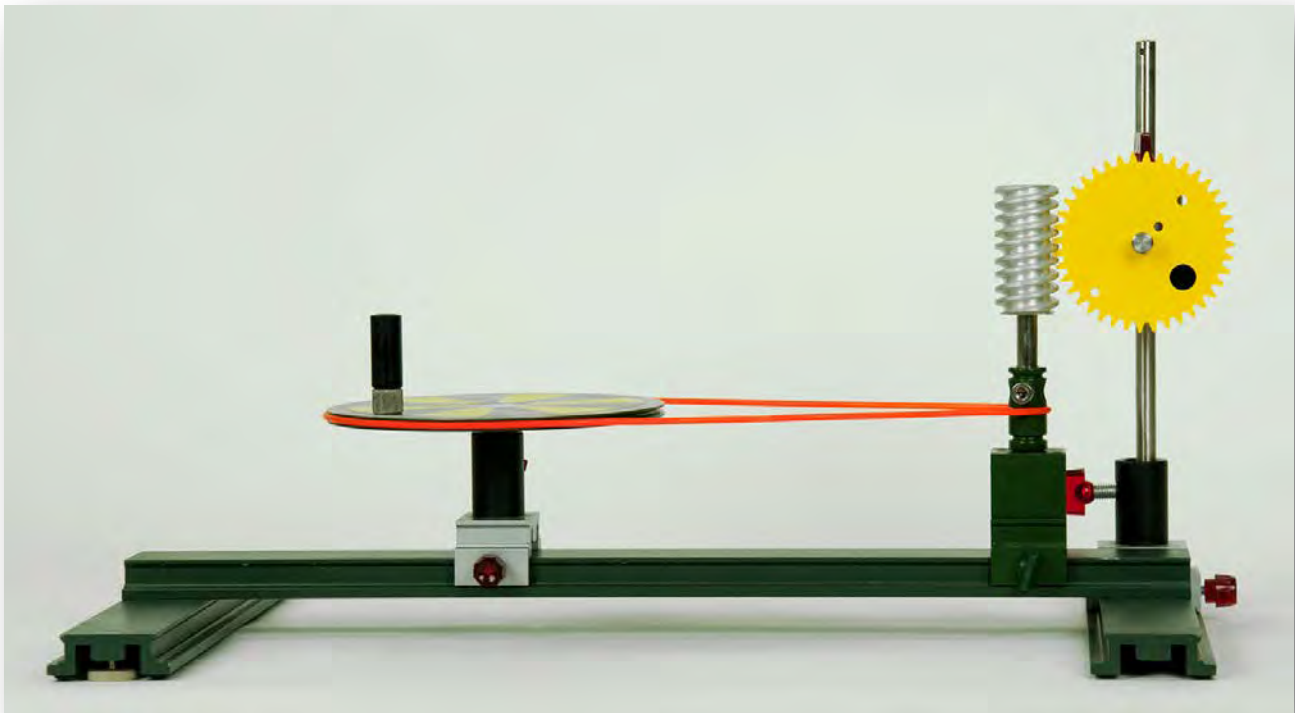




Material

Item-no.	Qty.	Description
DS101-1G	1	Support base, large, L=500 mm
DS093-04	2	Sliding saddle "Sepp", H=40 mm
DS402-3B	1	Pivot bearing with transverse hole, on saddle
DS402-3S	1	Drive pulley demo, with ball bearing
DS402-2N	1	Crank pin, L=50 mm
DS401-1A	1	Drive belts, set of 2
DM212-2G	1	Worm gear on rod
P7240-1C	1	Support rod, round, L=250 mm, D=10 mm
DS095-3K	1	Bosshead cross-pattern, demo 03
DS204-2L	1	Bearing pin with clamp insert
DM211-40	1	Gear with 40 teeth, yellow, D=84 mm
DS403-1G	1	Geared motor
DS403-2K	1	Clamp socket adapter
DS403-3F	1	Fixing screw M6
P3120-1K	1	DC Converter "inno"
P3120-1B	1	Rechargeable battery, "inno", 6V/10 Ah
DG507-12	1	Safety connecting lead, 12,5 cm, yellow
P3120-4A	1	L-shaped assembly platform

Purpose

To demonstrate the mode of operation of a worm gear unit.

Preparation – Setup 1

Fix the sliding saddle to the leg of the support base and insert the 250 mm support rod into this sliding saddle afterwards.

Mount the bosshead at a height of 15 cm and fix the gear with the help of the bearing pin with clamp insert at this bosshead.

Mount the pivot bearing at the right side of the support base and the second sliding saddle in the centre of the support base as shown on the image to the left.

Fix the worm gear on rod to the pivot bearing.

Mount the drive pulley in the left sliding saddle and screw the crank pin onto the drive pulley.

Put the long drive belt over the worm gear on rod to the middle groove of the pivot bearing; do not connect the drive belt to the drive pulley yet.

Adjust the sliding saddle with the worm gear on rod and the pivot bearing with the gear so that the teeth reach into the worm gear.

Now place the drive belt over the drive pulley and move the sliding saddle to taut the drive belt.

**Experiment 1**

Mark the worm gear on the front with a line.

Turn the drive pulley and compare the amount of turns of the worm gear with the amount of turns of the gear.

Result

..... turns of the worm gear result in one turn of the yellow gear.

Thus the gear transmission ratio is : 1 .

The experiment can be carried out with other gears too of course.

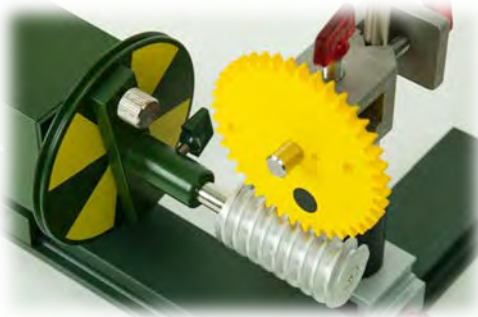
The gear transmission ratio depends on the amount of teeth on the gear and the pitch of the worm gear.

Now try to move the gear so that the worm gear and the drive pulley get set into motion (do not apply any strong force).

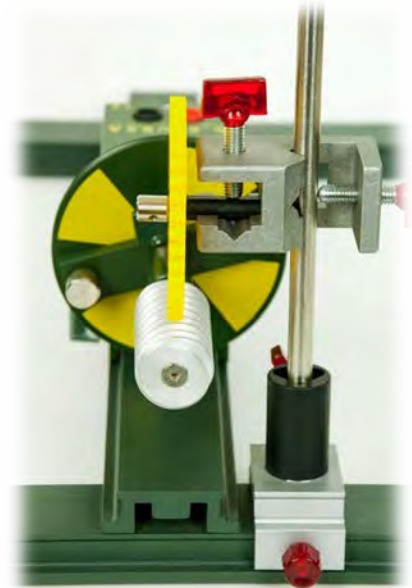
You will find out that a worm gear cannot be operated by a gear.

Preparation – Setup 2

Replace the drive pulley (with the sliding saddle) and the worm gear (with the pivot bearing) with the geared motor.



Fix the clamp socket adapter with the M6 fixing screw to the flywheel of the geared motor; afterwards mount the worm gear on rod at the clamp socket.



Place this unit in the centre of the support base.

Adjust the motor with the attached worm gear and the gear so that the teeth of gear reach into the thread of the worm gear.

Plug the DC-converter into the rechargeable battery and place this unit on the L-shaped assembly platform; afterwards connect the DC-converter through the connecting cables with the geared motor.

Experiment 2

Turn the knob of the DC-converter completely to the left.

Now turn the rechargeable battery on and slowly increase the voltage output.

While the geared motor is slowly running count the number of turns that the worm gear does while the gear is making one full turn.



Note

High gear transmission ratios can easily be achieved with the worm gear.

A large gear ratio means that large forces can be transmitted to the gear.

Due to the slow movement of the gear, the position of a tooth can also be controlled relatively precise by the geared motor.

If the geared is switched off, the gear is braked at this position and can no longer be moved.