

Gear & Lever Machine Worksheet

Name _____ Date _____ Period _____

Some useful information for doing problems with Gear and Lever Machines are given below:

Torque

Torque is the rotational equivalent of force. The torque produced by a force is equal to the force times the distance between where the force is applied and the center of rotation (fulcrum). Common units for torque are the Newton-meter and the foot-pound.

$$1 \text{ N} \cdot \text{m} = 1 \text{ Newton} \times 1 \text{ meter}$$

$$1 \text{ ft} \cdot \text{lb} = 1 \text{ foot} \times 1 \text{ pound}$$

The chart below is similar to one you saw on the Lab "Machines with Gears and Levers". To solve for the missing information in the chart you might want to use the following formula:

$$\frac{\text{Teeth \# (input)}}{\text{Teeth \# (output)}} = \frac{\text{Torque (input)}}{\text{Torque (output)}}$$

axle 1 (input)	Teeth	36	24	12	48	12	
	Weights	3	4	6	6		3
	Distance	6	2	4		8	12
axle 2 (output)	Teeth	12	12		12	24	36
	Weights	2		36	3	32	18
	Distance		4	2	3	4	1

axle 1 (input)	Teeth		24	12	30	75	96
	Weights	5		1	5	6	3
	Distance	6	8		3	7	12
axle 2 (output)	Teeth	10	48	72		25	40
	Weights	2	8	12	2		5
	Distance	2.5	8	2	3	2	