PHYSICS

TORQUE AND LEVERS

TORQUE

Torque (T): The turning effect caused by a force on a rigid body around an axis.

Torque can be calculated using the equation:

$$T = F \times d$$

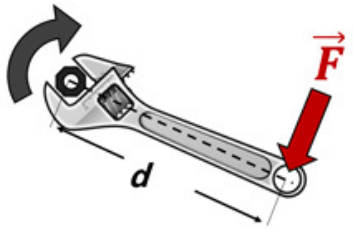
T –

F –

d –

NOTE: As the distance from the axis of rotation decreases, the force required to produce the same torque increases.

Ex 1. *Calculate the magnitude of the torque when you apply 84 N of force on a 0.25 m long wrench.*



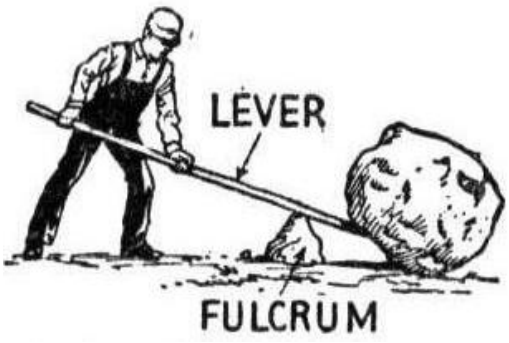
PHYSICS

TORQUE AND LEVERS

TORQUE ON LEVERS

The magnitudes of the effort torque, T_E, and the load torque, T_L, can be found for a lever using the equations:

Ex 2. *You are using a large plank to move a rock. The effort force has a magnitude of 450 N, and the distance from the effort force to the fulcrum is 2.2 m. What is the magnitude of the torque produced?*



PHYSICS

TORQUE AND LEVERS

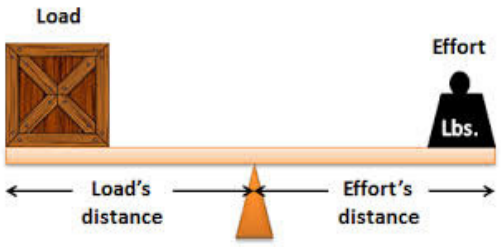
STATIC EQUILIBRIUM OF LEVERS

A rigid body is said to be in static equilibrium if it does not move in any direction and does not rotate.

LAW OF THE LEVER

When a lever is in static equilibrium, the magnitude of the effort torque is equal to the magnitude of the load torque. This can be written using the equation:

Ex: 3. You are lifting a load force of 1800 N with a 3 m long lever. The fulcrum is 0.45 m from the load. Calculate the effort force.



PHYSICS

HOMEWORK

Pg. 83 #3,6,7

Pg. 84 #10

Pg. 86 #12,14

Pg. 87 #2 - 9