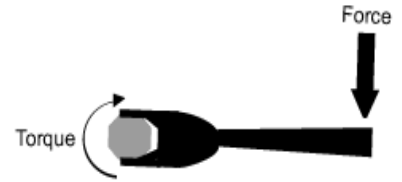


Levers and Torque

SPH4C

A **lever** is a rigid bar that can _____ freely around a support called a _____.

When a force causes a rigid body to rotate, we say that a _____ has been applied.



Torque is defined as the _____.

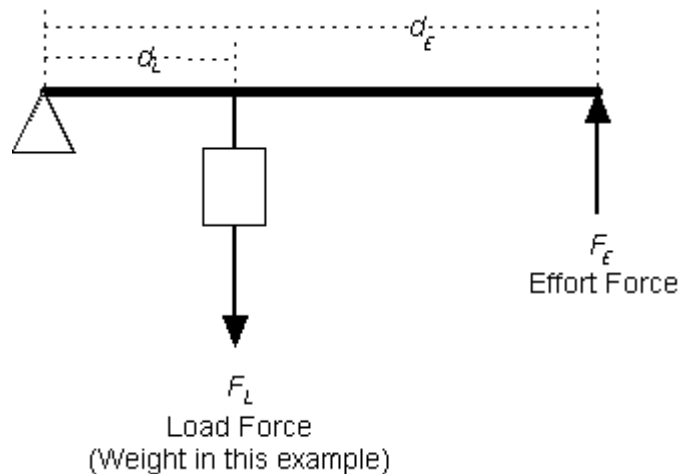
Torque (T) increases as _____ increases and also increases as _____ from the fulcrum increases:

Torque has units of _____.

Example: A force of 84 N is used to turn a wrench of length 25 cm. What was the torque on the wrench?

For any lever there are two torques:

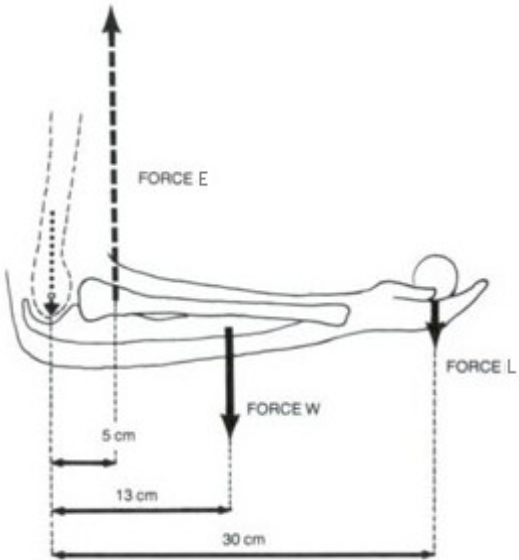
the _____ torque (_____) and the _____ torque (_____):



d_L and d_E are referred to as the _____ and _____, respectively.

If the load torque equals the effort torque, the lever is in _____.

Example: What force does your bicep need to exert to hold a weight of 134 N (30 lbs)?



More Practice

1. A mechanic applies a force of magnitude 540 N perpendicular to a wrench to loosen a nut. Calculate the magnitude of the torque if the distance from the applied force to the nut is (a) 0.30 m and (b) 0.50 m.
2. Calculate the magnitude of the effort force needed to produce an effort torque of magnitude 24 N·m at a distance of 0.25 m from the fulcrum of a lever.
3. A student uses an effort force on a lever to balance a load of mass 5.0 kg. The load arm is 84 cm and the effort arm is 24 cm. Calculate the magnitude of (a) the load force and (b) the effort force.