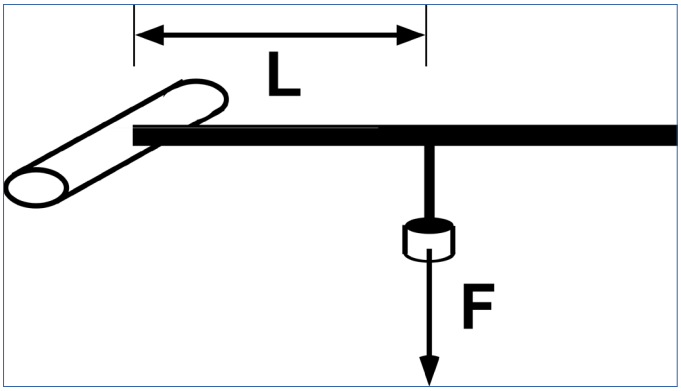
33026 Torque Feeler

Purpose:

To provide a tactile demonstration that torque (or moment) is the product of a force times the effective moment arm.



Background:

The calculation of a torque (or moment) involves taking the product of a force and the perpendicular distance measured from the line of action of that force to the point about which rotation is being considered. With this apparatus, rotation is being considered about the axis of the handle. The person holding the handle (with both hands) must provide a torque equal and opposite to the torque produced by the hooked mass hanging from the bar at some distance from the axis of the handle. The force involved is the constant weight of the hooked mass. The moment arm can be varied by having a helper change the position of the hooked mass.

The maximum torques will be experienced with the bar in the horizontal, and they will be zero when the bar hangs vertically. The cap on the end of the bar will keep the hooked mass from falling off the bar even when it is not horizontal. This will allow the user to experience the variation in the torque due to the dependence of the moment arm on the angle of the bar, even if the hanging position of the mass on the bar does not change.

Procedure:

To assemble the apparatus, slide the pierced washer with the mass attached onto the bar. Then, pass the hangerbolt through the hole in the handle. Finally, secure the bolt tightly with the shouldered wingnut. In use, the hooked mass hangs from the smaller hole in the pierced washer, and is clinched to prevent removal. This allows the mass to be safely positioned anywhere along the bar. The cap on the end is intended to retain the washer, especially when the dowel is hung vertically before twisting the handle to bring the dowel up to the horizontal.

Time Allocation:

This product requires five minutes of assembly prior to the first time use. The unit should then be left assembled. Actual experiment times will vary depending on methods of instruction, but normally will not exceed one class period.

Feedback:

If you have a question, a comment, or a suggestion that would improve this product, you may call our toll free number.