

Work Sheet 9a - Moments

Introduction

The moment of a force is its turning effect around a pivot. It is calculated by multiplying the force by its perpendicular distance from the pivot. The total anticlockwise moment of the forces on a see-saw or a beam must be equal to the total clockwise moment if the beam is to balance. This is known as the principle of moments. In this activity you must apply the principle of moments to calculate the position and size of the extra force needed to balance a beam.

Preparation

Before you start, review the Introduction and Study Points sections of the topic. In particular make sure you understand what is meant by the moment of a force and the principle of moments.

You will need paper and a pen to make your calculations.

Getting started

The beam to be balanced is shown in the area to the left of the screen. Initially, there are two forces acting at different points on the beam. You can drag a third force to one of a number of fixed positions along the bar and change its size by dragging the tail of the arrow.

Start by calculating the turning moments of the two fixed forces and then decide on the size and position of the balancing force. Drag the force into place and adjust its size.

Click the Release button at the bottom left of the screen to see if you have adjusted the force correctly to make the beam balance. The total clockwise and anticlockwise turning moments are displayed in the box to the right of the screen.

If you have failed to balance the beam and it turns, click Restart and change the balancing force appropriately.