# WORK DONE by a VARIABLE FORCE (VERTICAL AND TANGENTIAL)

## HFC38

**Year 1**
study

### Features

- TWO experiments in ONE
- Bench top unit
- Mechanical Work and Potential Energy
- Dynamometer and protractor
- Double sided for large groups
- Full set of weights and hangers supplied

### Description

This apparatus allows the students to undertake TWO experiments within ONE apparatus; Work done by a Force in vertical and tangential. The vertical back board contains one experiment on each side, thus allowing student groups to work on each experiment separately.

Work done by a Force (Vertical): The apparatus is a simple lifting mechanism with non-linear characteristics. A suspension cord carrying a loaded trolley at mid span is tensioned by passing the cord over a pulley at one end and down to a weight hanger. As the vertical effort is increased, the tensioned cord will move to a new equilibrium position lifting the loaded trolley. Heights of the load and effort are measured relative to the base. All the pulleys are fitted with ball bearings to minimise friction effects.

Work done by a Force (Tangential): A pivoted arm carrying a Load hanger at its end is restrained by a spring balance at right angles to the arm. The angular position of the arm is indicated by a protractor scale attached to the back board. The effort is the force needed to hold the weighted arm at a particular angle. This can be repeated for several different weights.

### Related laws

- Mechanical Work
- Potential energy

- Work done
- Simple Machines
- Equilibrium
- Izod Testing
- Levers

## Learning capabilities

- To determine the work done by a variable effort and to compare with the work done in lifting the load
- To show that the work done by the effort is equal to the change in potential energy of the load
- To obtain the experimental relationship between effort and distance moved by effort, and to compare with a theoretical prediction
- To show that the work done is the area under a graph of load against distance moved

## Technical Specification

- Tangential Arm: 350mm long
- Protractor: 0...90° range, 10° resolution
- Spring Balance: 6kgf range, 0.1kgf resolution
- 2 x Load hanger
- Weights set: 11 x 0.1N, 5 x 0.2N, 1 x 1N, 5 x 2N, 4x10N
- Back Board: 400(L) x 150(W) x 500(H) mm

## What's in the Box?

- 1 x HFC38 Board assembly
- 1 x Pulley hanger
- 1 x Load hanger
- 1 x Cord assembly
- 1 x Tape measure
- 11 x 0.1N; 5 x 0.2N; 1 x 1N; 5 x 2N; 4 x 10N
- Instruction manual
- Packing list
- Test sheet

## Weights & Dimensions

- Weight: 4 kg
- Length: 400mm
- Width: 150mm
- Height: 550mm

## Essential Services

- Sturdy Bench Top

## Ordering information

To order this product, please call PA Hilton quoting the following code:
HFC38