

Mass Challenge

Equipment

- String and scissors
- 2 kg mass (with hook)
- Stands, clamps and cross bars
- Pulleys
- Spring Scales
- Mass sets

Please request any additional supplies you might need

Make sure you record your partners' names and the date (as well as your name) in your "journal".

Objective

Learn about pulleys

- Construct a pulley system
- Recognize mechanical advantage

Basic lab procedures

Recognize uncertainty

Conceptual (C-level)

- Using the supplied string – lift 2 kilograms of mass.
- Devise a method that uses the least amount of counter mass – or lifting force – to lift 2 kilograms of mass.

Basic Lab (B-level)

- Draw a picture of your configuration(s).
 - Describe what is happening.
 - Describe what you noticed.
- Devise a method to calculate the force required to lift the 2 kilogram mass for any arbitrary pulley configuration.
- There is an old saying "You don't get owt for nowt" which translated means "You don't get something for nothing". List the trade-offs for various configurations.
- What could make your solution better?

Advanced/Extended Lab Ideas (A-level)

- Determine the frictional forces that increase the lifting force and decrease the necessary holding force.
- What are you curious to investigate?