armfield

Engineering Fundamentals - EF series

EF SERIES

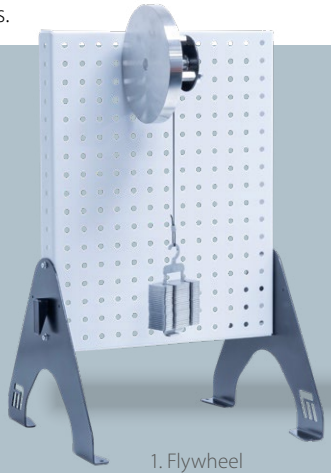
EFK2-MKII Dynamic Fundamentals Kit

The Engineering Fundamentals EFK2-MKII Dynamics fundamentals kit is designed to enable students to gain an understanding of the fundamentals of engineering by the process of learning via hands-on experimentation.

Practical experience allows students to see the real-world application of theoretical knowledge, leading to a deeper and more comprehensive understanding of engineering principles.

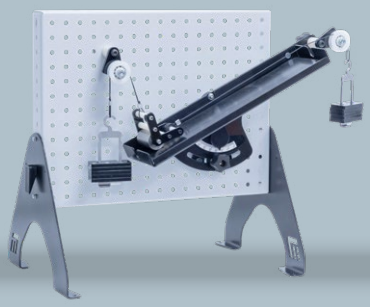
The modular kit is supplied in conjunction with a multifunctional base unit enabling the student to conduct their own experiments in subjects such as Pulleys, Flywheels, Friction, Inclined planes, and Toggle Mechanisms.

Each kit is supplied with a highly visual user-friendly operational guide, enabling the student to understand the theory of the subject by the application of practical experimentation.

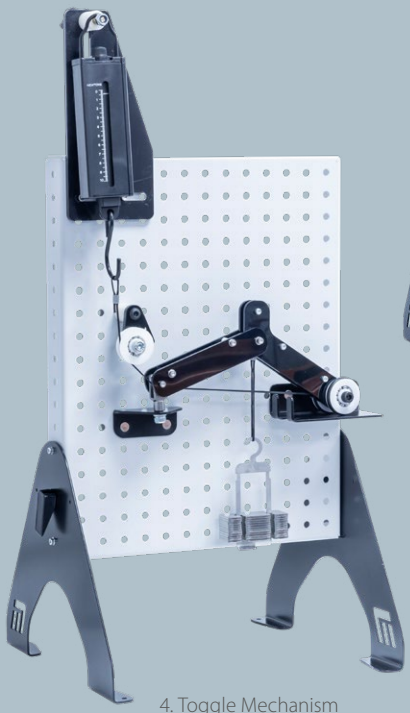


1. Flywheel

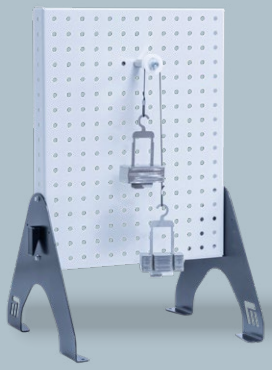
2. Types of Friction



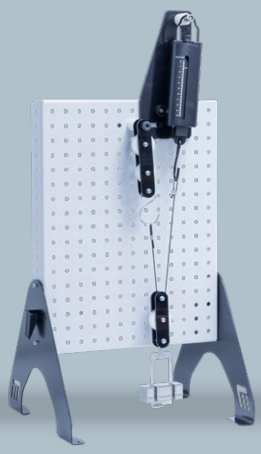
3. Inclined Forces



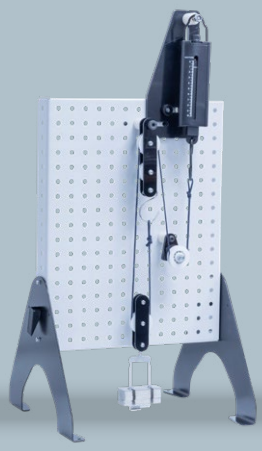
4. Toggle Mechanism



5. Pulley systems change in direction



6. Pulley System



7. Force Multiplication Pulley Systems

Topics Covered:

- PULLEYS
- FLYWHEELS
- TOGGLES
- FRICTION
- INCLINED PLANES

EACH KIT CONTAINS A SINGLE MULTIPURPOSE FRAME

Features/benefits

Features

- Neatly presented in an easily identifiable and durable storage tray
- Trays have clear lids making it easy to see their contents
- Accompanied by a detailed manual, including Student handouts and teachers notes with various practical exercises
- Clear and concise assembly instructions for each experiment
- Multiple experiments per kit
- Toolless assembly

Benefits

- Enhanced Understanding of Concepts
- Improved Problem-Solving Skills
- Engagement and Motivation
- Teamwork and Communication

Tray 1 of 2 supplied with **EFK2- MKII**

UK office - email: sales@armfield.co.uk tel: +44 (0) 1425 478781 (for ROW)
USA office - email: info@armfield.inc tel: +1 (609) 208-2800 (USA only)

Issue: 4
URL: http://www.armfield.co.uk/ef

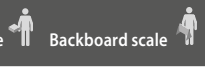
Applications: ME ChE CE IP

armfield.co.uk

Requirements

EFK2 MKII

Scale



- EFK2- MKII base unit with stand on which to build the experiments from the tray components

Experimental content

- describe the energy changes that take place when a falling weight causes a flywheel to rotate.
- use a value for gravitational field strength to calculate the weight of a given mass.
- explain the meaning of the following terms:
  torque, moment of inertia, angular velocity, angular acceleration.
- and identify the corresponding quantities in linear motion.
- use a graph of torque vs angular acceleration to obtain a value for the moment of inertia.
- use the formula $I = ½ (M. R^2)$ to calculate the moment of inertia of a flywheel.
- use the formula $Ep = m. g. x$ to calculate the loss in gravitational potential energy of a falling mass.
- use the formula $Ek = ½ (I. \omega)$ to calculate the kinetic energy of a spinning flywheel. Resolve a given force into two perpendicular components.
- use given information on horizontal, vertical, and oblique forces to determine whether a beam is in equilibrium.
- distinguish between static and sliding friction.
- describe an experiment designed to measure both the static and sliding frictional force between two surfaces.
- explain why gently tapping the bench improves the accuracy of a measurement of sliding friction.
- use the formula μs = frictional force/normal force to calculate the coefficient of static friction.
- use a graph of frictional force vs normal force to obtain a value for the coefficient of static friction.
- resolve a force into two perpendicular components using $Rn = W \cos \varnothing$ and $Rp = W \sin \varnothing$
- use the formula $\mu k = \tan \varnothing$, where $\varnothing$ is the minimum angle at which the cart slides down a slope to calculate the coefficient of sliding friction.
- describe an experiment to measure the normal and parallel components of the weight of an object on an inclined plane.
- describe two reasons why using a pulley could assist with moving an object.
- explain the meaning of the following terms, relating to pulley systems:
  mechanical advantage, velocity ratio, energy efficiency.
- describe an experiment to measure the mechanical advantage of a pulley system.
- describe the effect of multiple pulleys on the energy efficiency of the system.
- explain the meaning of 'snapping' in relation to a toggle mechanism.
- describe an experiment to measure the force needed to make a toggle mechanism 'snap',
- identify three practical applications of toggle mechanisms.

Ordering codes

- EFK2-MKII Dynamic Fundamentals Kit

Ordering specification

Tray friction plate large rough	1
Salter 12 spring balance 10N x 0.1N	1
Single Pulley Assembly	1
Flywheel Assembly	1
Friction assembly (rough surface)	1
Balance Slider Plate Assembly	1
Work Panel for Fundamentals	1
5g hanging weights	52
Hanging Weights	2
Toggle Assembly	1
Adjustable Plate Assembly	1
Single Parallel Pulley Assembly	1
Double Pulley Assembly	1
Inclined Plate Pulley Assembly	1
RH Adjustable Pulley Assembly	1
Spring Balance Pillar	1
LH adjustable pulley assembly	1
Looped String kit	1
Friction assembly (wood)	1
Toggle Travel Plate	1
Inclined Tray Assembly	1
3D Printed Cart	1
Friction assembly (stainless steel)	1
Roller Assembly	1
Plastic shallow tray BLACK	1
Thin foam tray insert 355x270x5mm	3
Tray Lid	2
Deep tray	1
Crash Foam 360mm x 260mm, thickness 25mm	3
62mm daughter tray	1
Tray friction surface plate wood (large)	1
Laser cut foam for packaging	1
Spring balance mounting plate	1
Stainless Steel plate large for friction assemblies	1

Related products

- EFK1-MKII Statics Fundamentals Kit
- EFK4-MKII Mechanisms Fundamentals Kit
- EFK6-MKII Materials Fundamentals Kit

Overall Dimensions

Tray 1		Tray 2	
Length	0.43m	Length	0.43m
Width	0.21m	Width	0.21m
Height	0.08m	Height	0.24m

Packed and crated shipping specifications	
Volume	0.032m^3 per kit
Gross weight	9Kg

Armfield standard warranty applies with this product