


MEI Mathematics in Education and Industry
Innovators in Mathematics Education

Mechanics Resources

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Overview

- Background to 'Mechanics Problem'
- University Initiatives
 - mathcentre Leaflets
 - mechanics tutor Project
- MEI Ideas and Initiatives
- Exemplar Mechanics Experiments and Practical Investigations
- What next?

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Background

Over last decade there has been a plethora of reports on Mathematics pre-19 and at the further/ higher education interface, including:

- Cockcroft Report (1982)
- Tackling the Maths Problem, LMS (1995)
- Measuring the Mathematics Problem, Hawkes and Savage (2000)

See <http://www.mei.org.uk/reports.shtml> for further reports/ publications and link

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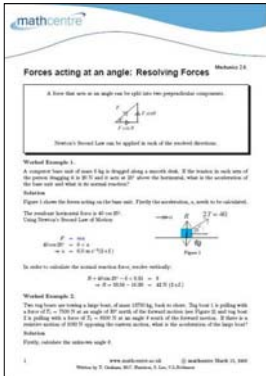
Background

- In recent years emergence of a lack of mechanics knowledge by those entering maths-related degrees, e.g. Engineering
- A number of reasons including
 - Perception of mechanics being 'difficult' option in Maths A levels
 - Changes to Specification (primarily in 2004)
(see S Lee's Powerpoint from Friday)

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University Initiatives

- Responded by producing materials for university students who lack knowledge in mechanics
 - mathcentre (25 - two page mechanics leaflets)
 - [Slope with friction.pdf](#)
 - [Forces at an angle.pdf](#)



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University Initiatives

mathtutor

- Video tutorials to bridge gap from school to university mathematics
 - View content of the 7 DVDs on mathtutor [website](#)
 - Shortened versions available as iPod [downloads!](#)
 - Increasing in popularity

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University Initiatives

mechanicstutor

- Similar in nature to **math**tutor resources but also have a focus on experiments
- Not only early modules, but also later content, e.g. M3
 - Have a CD which contains some example content (review after Janice gets back to us)
- MEI staff involved in project

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MEI Ideas and Initiatives

- Promoting Further Maths
- Using mechanics as a vehicle for enrichment events
- Mechanics experiments and practical investigations (including computer resources)

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MEI Ideas and Initiatives

i Promoting Further Maths

- Opportunity for students to study some, or more mechanics if doing AS/ A level FM
- FM Network can offer this opportunity (or assist a school to)

e.g. A student who decides at end of year 12 that they want to do Engineering at university and who hasn't studied any mechanics could do an AS in Further Maths and pick up some mechanics in year 13.

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MEI Ideas and Initiatives

ii Using mechanics as a vehicle for enrichment events

- Many FM Centres offer enrichment events as part of their activities
 - To promote maths and get students interested in it
- Opportunity to get students involved in doing some mechanics
 - Practical experiments
 - Computer simulations

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MEI Ideas and Initiatives

iii Mechanics experiments and practical investigations

- Producing some interactive 'Flash' resources which simulate experiments, see <http://www.meiresources.org/flash/mechanics/>
- Commercial software available, IP Maths: <http://www.fable.co.uk/ipmaths.htm>
 - Allows you to 'construct' computer animations
 - 72 mechanics 'experiments'
 - Discussions between FMN and IP Maths underway

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MEI Ideas and Initiatives

iii Mechanics experiments and practical investigations

- Proposing to revive a selection of the MEI coursework activities
- To include:
 - A 'kit list' for the experiment
 - Some guidance notes

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Exemplar Mechanics Experiments and Practical Investigations


In the Mathematics Education Centre at Loughborough University, mechanics experiments were designed around the Mechanics in Action Kit and ran as NAGTY Events for 11-18 year olds.

Examples will now be shown.

As an addition to MEI Cwk tasks, experiments such as these could be modified for use in A level study

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Exemplar Mechanics Experiments and Practical Investigations




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Moments



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Friction



Ladder Problem Ruler Problem Inclined Plane
 Extend using
 Brooms/Gloves

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Motion in a circle



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Impact



What next?

What are your thoughts on 'the state' of mechanics?

What could (should) be done?

What are your thoughts on what has been detailed in the session and the use and development of resources for mechanics?