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Boundaries and Bridges in post-16 Mathematics Education

F.E. Resources on the National STEM Learning Website

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Resources for mathematics post-16

What do we want?

- **Resources for GCSE**
- **Resources in a context**
- **Resources for Core Maths**
- **Resources for A level**

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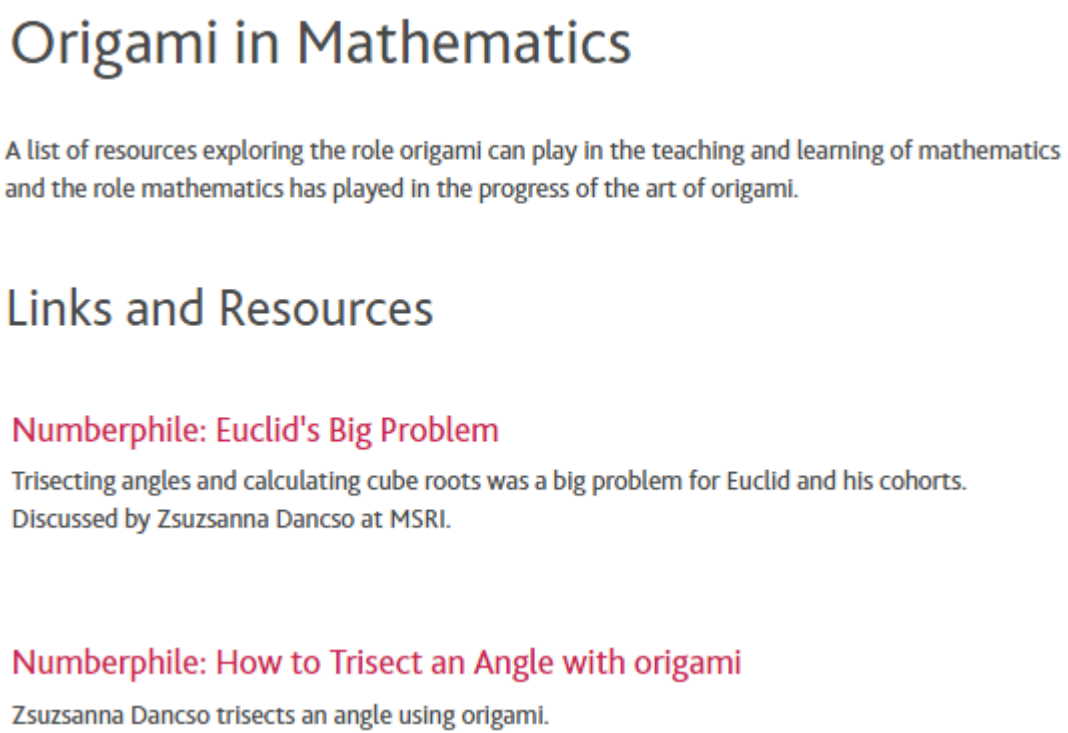
Some Maths

A4 paper

- **Why is it the size it is?**
- **How heavy is a piece of A4 paper?**
- **How thick is a piece of A4 paper**

- **Origami**

Origami resources



Origami in Mathematics

A list of resources exploring the role origami can play in the teaching and learning of mathematics and the role mathematics has played in the progress of the art of origami.

Links and Resources

Numberphile: Euclid's Big Problem

Trisecting angles and calculating cube roots was a big problem for Euclid and his cohorts. Discussed by Zsuzsanna Dancso at MSRI.

Numberphile: How to Trisect an Angle with origami

Zsuzsanna Dancso trisects an angle using origami.

https://www.stem.org.uk/resources/community/collection/19810/origami-mathematics

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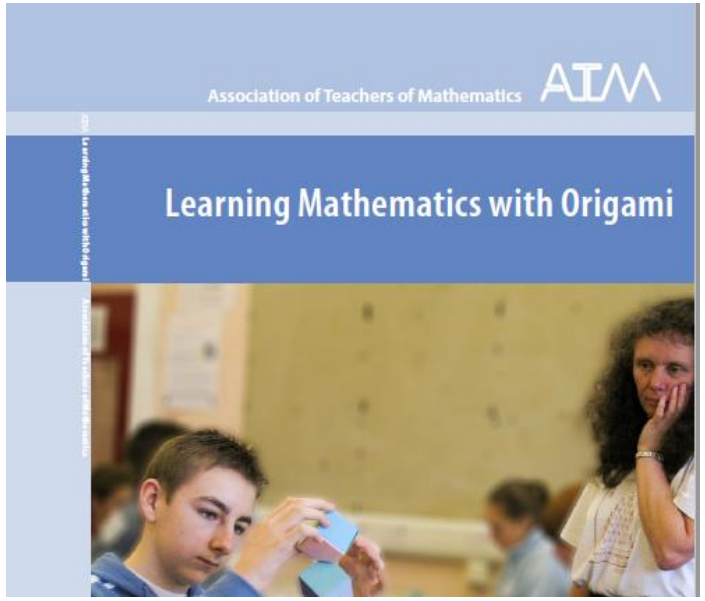
Origami in maths books



MEI
Innovators in Mathematics Education

CASIO

MEI Conference 2016

Paperfolding and Proof

Jane West

janewest@furthermaths.org.uk

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Tin Foil

- How thick is a piece of tin foil?
- Do you think it is thicker or thinner than a piece of paper?
- Suggest a method for calculating
- Interpret your answer.

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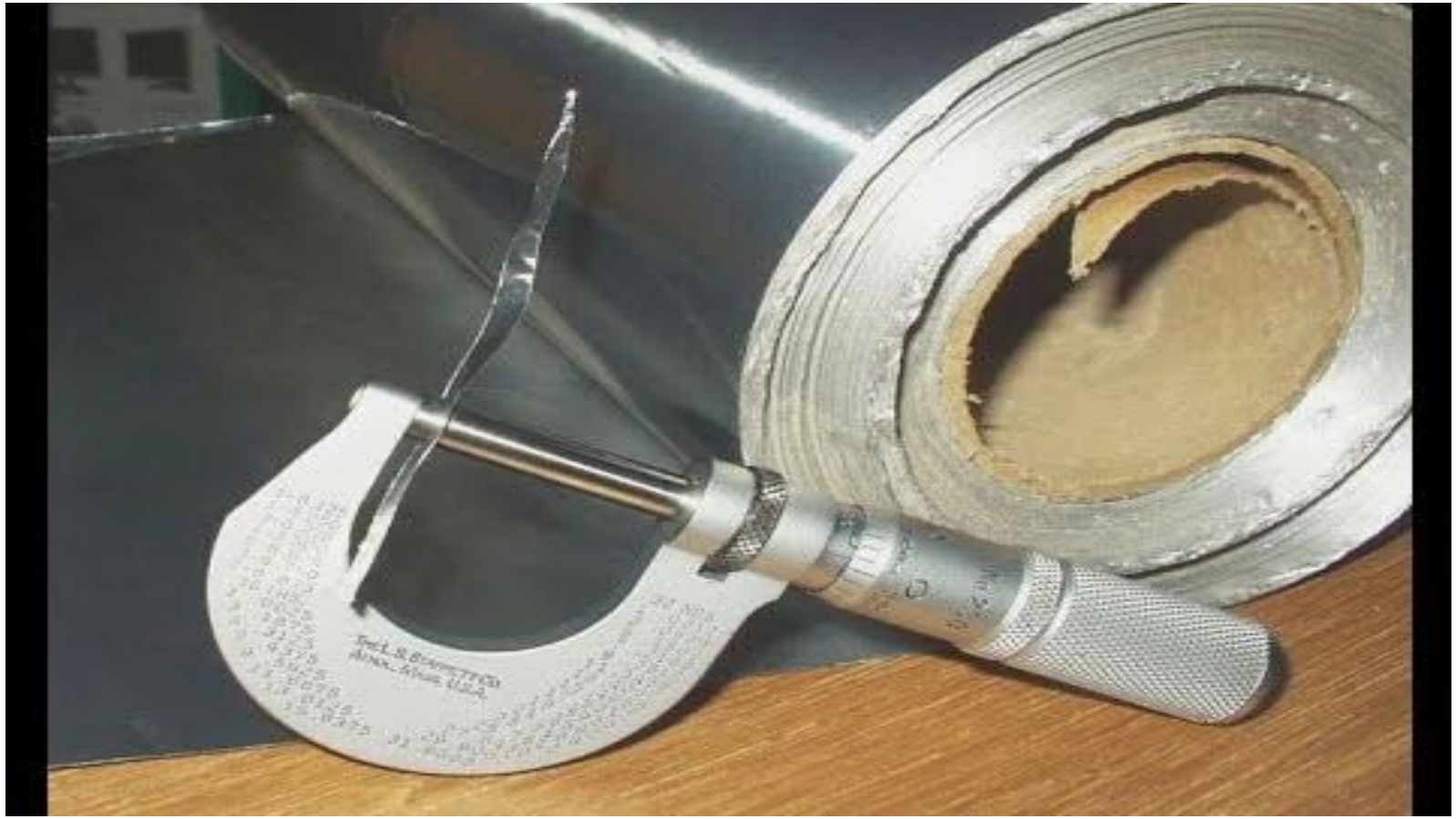

Resource example

Mathematics in Real Life Contexts - Steel Mill

A collection of six resources exploring the mathematics used in the production of steel.

Students explore the:

*Design of tin cans requiring the formation of equations, calculation of the volume of a cylinder and the minimum value for surface area.

*Most efficient way to stamp out the template for a drinks can from a sheet of steel requiring the calculations of areas of squares, circles and the use of trigonometry.

*Elimination of wavy edges in steel production using Pythagoras' theorem, trigonometry and the calculation of the length of the arc of a sector.

*Transportation costs associated with supplying goods to the correct place.

*Use of repeated percentages to calculate the reduction in width of tinplate and solve

SUBJECT(S)	Mathematics
TAGS	n.a
AGE	11-14, 14-16, 16-19
PUBLISHED	1990 - 1999
RATING	★★★★★
URL	https://www.stem.org.uk/cx64s
COMMENTS	0

https://www.stem.org.uk/cx64s

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Mathematics Assessment Resource Service (MARS)

The Mathematics Assessment Resource Service (MARS) is a collaboration between the University of California at Berkeley and the Shell Centre team at the University of Nottingham, with support from the Bill and Melinda Gates Foundation. The team is known around the world for its innovative work in maths education. Previous projects that members of the team have worked on include the DfE Standards Units and the Bowland Maths resources.

Detailed below are the different types of resources within the collection.

Concept development lessons

The concept development lessons focus on assessing and developing conceptual understanding. The lessons are designed to reveal and develop students' conceptions, and misconceptions, of significant mathematical ideas and how these connect to their other knowledge.

The lessons are designed to be used either during a curriculum unit on a topic, to gauge and improve students' level of understanding, or later in the year as review and support.

SUBJECT(S)	Mathematics
TAGS	n.a
AGE	14-16
PUBLISHED	2010 to date
RATING	★★★★★
URL	https://www.stem.org.uk/cxfcom
BACKGROUND	Structure of the classroom challenges
COMMENTS	0

https://www.stem.org.uk/cxfcom

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Resource Collections

Maths and Engineering	**https://www.stem.org.uk/lxmdv**
Mechanical Engineering	**https://www.stem.org.uk/lxo9b**
Civil Engineering	**https://www.stem.org.uk/lxnzv**

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GCSE resources

Secondary mathematics resource packages

A selection of hand-picked resources covering all the statements in the Key Stage 3 and Key Stage 4 programmes of study.

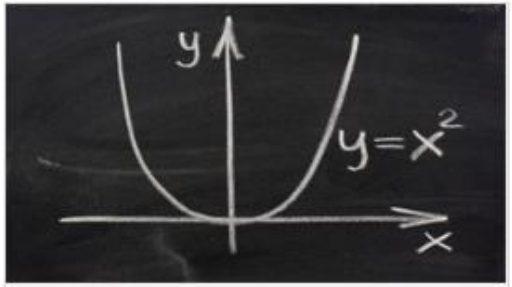
Topics

NUMBER

- Place value
- Four operations using decimals
- Four operations using fractions
- Four operations using positive and negative integers

GEOMETRY AND MEASURES

- Perimeter and area of shapes
- Surface area and volume
- Compound units
- Measuring lines, angles and using scale drawings



ALGEBRA: EXPRESSING RELATIONSHIPS

- Algebraic notation
- Simplifying algebraic expressions
- Arithmetic progressions
- Other sequences

https://www.stem.org.uk/secondary-maths

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Scams

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Core Maths

The Core Maths initiative is aimed at increasing the number of post-16 students studying mathematics.

Core Maths is about students doing meaningful mathematical problems to increase their confidence in using mathematics to be better equipped for the mathematical demands of other courses, higher education and employment.

Core Maths is the new Level 3 qualification for students who achieved at least a Grade 4 (formerly a Grade C) at GCSE mathematics and wish to develop their practical skills so they may apply these in work, study or everyday life.

https://www.stem.org.uk/core-maths

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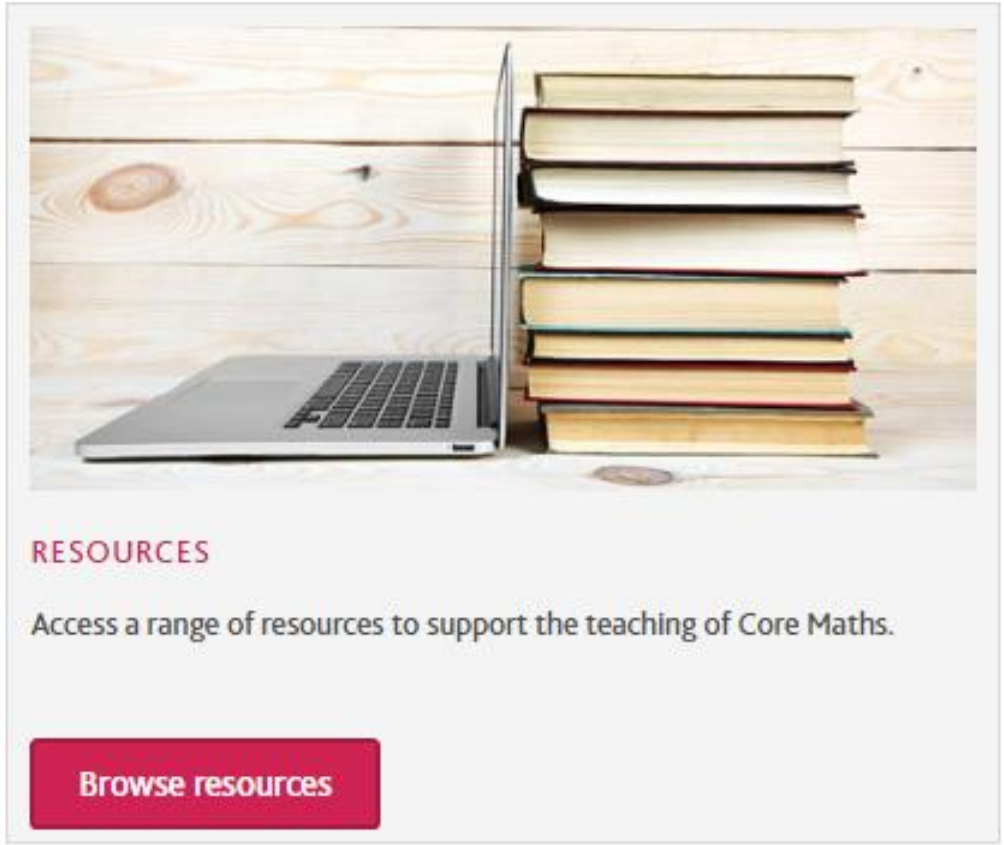
Core Maths Resources



https://www.stem.org.uk/core-maths/resources

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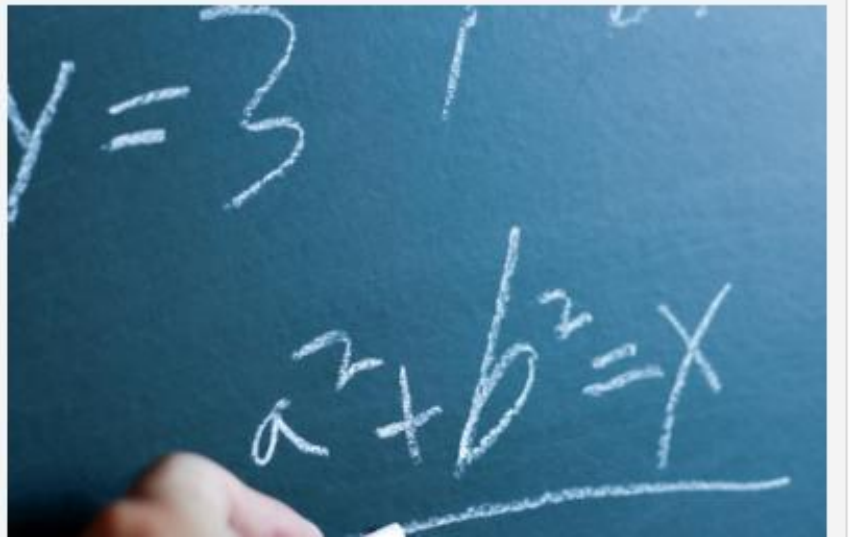
A level mathematics resource packages

Explore our selection of key stage 5 mathematics teaching materials chosen from the STEM Learning resource collection. The resource packages cover the maths A level programme of study for teaching in schools from 2017. Each resource has been hand-picked to cover key subject content in Pure, Mechanics and Statistics, as well as meet the overarching themes of mathematical argument, language, proof, problem solving and modelling.



MECHANICS

Forces and Newton's laws

Kinematics

https://www.stem.org.uk/alevel-maths

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Support for post-16 and FE

STEM Learning offers a comprehensive range of resources and support for teachers, managers, lecturers, technicians and support staff at all stages of their careers.

T LEVELS AND BEYOND

Technical Education reforms will prepare learners for the modern workplace. Find out more about the skills they'll need to succeed with a STEM insight placement.

STEM Insight

ENTHUSE PARTNERSHIPS

Working with local schools, colleges and industry, partnerships will receive up to £12,000 worth of support to improve young people's achievement and engagement in STEM.

Get Involved

RESIDENTIAL CPD

Enhance your subject knowledge with our bursary-supported CPD at the National STEM Learning Centre. Create lasting benefits using the Impact Toolkit for long-term action planning.

Browse our residential CPD

https://www.stem.org.uk/fe-support

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