# Additional content resource list

## GCSE Applications of Mathematics
## GCSE Methods in Mathematics

This support material booklet is designed to accompany the OCR GCSE Applications of Mathematics and Methods in Mathematics specifications for teaching from September 2010.

# Contents

# Introduction

In order to help you plan effectively for the implementation of the new specifications we have produced this list of possible resources covering the additional content for Applications of Mathematics and Methods in Mathematics. These support materials are designed for guidance only and OCR cannot guarantee the quality or continued existence of any website referenced.

This material is provided in Word format so that you can use it as a foundation to build upon, amend to suit your teaching style and learners' needs and incorporate within schemes of work as appropriate.

The specifications are the documents on which assessment is based and these specify what content and skills need to be covered in delivering the course. At all times, therefore, this support material booklet should be read in conjunction with the specifications. If clarification on a particular point is sought the relevant specification should be consulted.

In the following tables, the first column indicates the intended audience, teacher(T) or learner(L) and the second column the format of the available resource, interactive(I), text(T) or video(V). The third column provides a brief description of the resource and the final column its web address.

■ **Applications F2E.1a, H2H.1a and H2H.1e** carry out calculations relating to enterprise, saving and borrowing, appreciation and depreciation and understand RPI, CPI and **AER**

(**A**udience: **T**eacher **L**earner   **F**ormat: **I**nteractive, **T**ext based or **V**ideo)

| | | | |
|---|---|---|---|
| T | T | RPI. | http://www.statistics.gov.uk/cci/nugget.asp?id=21 |
| T | T | CPI and RPI explained in detail and how they are calculated. | http://openlearn.open.ac.uk/mod/resource/view.php?id=164365 |
| T | T | Short articles on AER. | http://www.learnmoney.co.uk/banking/bank-46.html<br><br>http://www.whatprice.co.uk/financial/mortgage-terms APR.html<br><br>http://www.accountingissue.info/what-is-aer-apr-ear interest.html |
| T/L | T | A short piece defining APR, AER and EAR but little actual mathematics.  Nevertheless a good introduction. | http://www.guardian.co.uk/money/2007/oct/25/debt.savings |
| T/L | T | A document issued by the Office for National Statistics (ONS) explaining CPI and RPI and how they are calculated.  It should be just about accessible to learners. | http://www.statistics.gov.uk/downloads/theme_economy/cp_brief_guide_2004.pdf |
| L | I | Brief explanation of APR and an APR calculator. | http://www.efunda.com/formulae/finance/apr_calculator.cfm |
| L | I | Loan repayment calculator. | http://www.pem.co.uk/common/calculators/loan.html |
| L | T | Interest calculations including APR.  Some of the compound interest calculations are above what is expected but may easily be omitted. | http://mathforum.org/dr.math/faq/faq.interest.html |
| L | T | The difference between APR and AER. | http://www.independent.ie/business/personalfinance/knowing-your-apr-from-your-aer-63906.html<br><br>http://www.loans-choice.org.uk/apr-aer-ear.shtml |
| L | V | A six minute instructional video (American but no particularly American terms used). Two questions are posed at the end with answers withheld if needed by pausing. | http://www.youtube.com/watch?v=t-HvHxy4Yas&feature=related |

■ **Applications F2E.1b and H2H.1b**      use mathematics in the context of personal and domestic finance, including loan repayments, mortgages and budgeting, exchange rates and commissions

(**Audience**: *Teacher Learner*     **Format**: *Interactive, Text based or Video*)

| | | | |
|---|---|---|---|
| T | T | The home page of the Personal Finance Education Group (pfeg). A very rich source and an essential starting off point with learner and teacher resources. | http://www.pfeg.org/index.html |
| T | T | Another useful starting point.  Registration (free) is required. | http://www.moneysmartworld.com/index.php/free-resources-a-downloads.html |
| T | T | Useful sites include:<br><br><br><br>and a useful US site is: | http://www.bankofengland.co.uk/education/<br><br>http://www.moneymakesense.co.uk/<br><br>https://treas.gov/offices/domestic-finance/financial-institution/fin-education/council/OFE-CFAP-Resources.pdf |
| T | T | The Financial Services Authority website has a useful tool which calculates repayments for different interest rates over different time periods.  This could be used by learners to construct relevant tables and graphs/charts in addition to checking their own calculations.<br>A range of financial calculators, including those for credit cards, may be found at: | www.moneymadeclear.fsa.gov.uk/tools/loan_calculator.html<br><br><br><br>http://www.moneymadeclear.org.uk/tools/hometools.html |
| T | T | Brief dictionaries relating to financial terms may be found at: | http://moneyterms.co.uk/<br><br>http://www.pfeg.org/teaching_resources/glossary/index.html<br><br>http://lexicon.ft.com/overview.asp |
| T | T | A useful resource database initially designed for the Basic Skills Agency to support Financial Literacy. | http://www.fin-lit-resources.org.uk/ |
| T | T | A collection of financial education resources used as support in Scotland. | http://www.ltscotland.org.uk/financialeducation/findresources/index.asp |

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|---|---|---|---|
| T | T | Basic finance terms such as budgeting, borrowing money and interest are explained but there is little in the way of actual calculations. | http://money.citizenshipfoundation.org.uk/ |
| L | I | A compound interest calculator in Excel. (On TRE so registration (free) is required). | http://tre.ngfl.gov.uk/server.php?request=cmVzb3VyY2UuZZn VsbHZpZXc%3D&resourceId=9271 |
| L | T | Basic instructions as to how to set up a simple spreadsheet to budget personal finances including checking. | http://www.studygs.net/spreadsheet/index.htm |
| L | T | Simple crib sheet (IBO) on financial calculating (simple/compound interest and exchange rates) defining the basic terms (but in $). | http://www.ibmaths.com/free/stnotes/financial%20maths.pdf |
| L | T | Interest calculations including APR.  Some of the compound interest calculations are above what is expected but may easily be omitted. | http://mathforum.org/dr.math/faq/faq.interest.html |

■ **Applications F2E.1c and H2H.1c** use spreadsheets to model financial, statistical and other numerical situations

*(**A**udience: **T**eacher **L**earner **F**ormat: **I**nteractive, **T**ext based or **V**ideo)*

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|---|---|---|---|
| T | T/I | Examples of spreadsheet templates for a personal financial planning (some are in US$, but £s can simply replace them).<br><br><br><br><br><br><br><br><br><br><br><br>This last one is at the Microsoft Office site where a large number of free templates are available. | http://www.vertex42.com/ExcelTemplates/personal-budget-spreadsheet.html<br><br>http://www.womensfinance.com/worksheets/monthlyexpenses.shtml<br><br>http://www.womensfinance.com/worksheets/dailyblank.shtml<br><br>http://www.vertex42.com/ExcelTemplates/monthlyhousehold-budget.html<br><br>http://exceltemplates.net/household-budget/household-budget-worksheet/<br><br>http://exceltemplates.net/household-budget/daily-expenses-tracker/<br><br>http://office.microsoft.com/en-gb/templates/CT101172321033.aspx |
| T | T | This free ebook gives guidance on all the basic statistical facilities of Excel but with the emphasis in Excel 2007. However the basic statistics functions are virtually identical for all versions of Excel. | http://www.acrobatplanet.com/non-fictions-ebook/pdf-ebook-excel-2007-data-amp-statistics-cookbook.html |
| T | T | A brief but informative summary of the basic Excel statistical functions (some of which are not required here). | http://www.uoregon.edu/~sadofsky/425/EXCEL.pdf |
| T | T | *Spreadsheets in Education* is an Australian free online journal worth looking at in the chance of finding something relevant – previous issues are available. | http://epublications.bond.edu.au/ejsie/ |

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| T | T | Some suggestions regarding the positive learning arising from learners using spreadsheets is shown, for example, in these articles. | http://epublications.bond.edu.au/cgi/viewcontent.cgi?article=1066&context=ejsie  http://epublications.bond.edu.au/cgi/viewcontent.cgi?article=1001&context=ejsie |
| T | T | A collection of downloadable spreadsheets including tessellations and compound interest. | http://www.mathsfiles.com/Excel.htm |
| T | T | A collection of readymade "business" spreadsheets – only one or two are relevant to the task here but others might prove useful for illustrative purposes. | http://www.bized.co.uk/learn/sheets/intro_student_bus.htm |
| T | T | Some ideas as to how spreadsheets may be meaningfully used in the classroom – more of an ICT focus. | http://www.ncwiseowl.org/kscope/techknowpark/freefall/resources.html |
| T | T | Example of a Y9 spreadsheet model of a school production. | http://atschool.eduweb.co.uk/mbaker/worksht/ssheet1.html |
| T | T | This lesson plan shows how an Excel worksheet may be used to solve an equation by trial and improvement. | http://www.skola.gov.mt/maths/AcrobatDocuments/Improvement.PDF |
| T | T | Issues arising from the teaching of statistics through the medium of spread sheets. | http://www.amstat.org/publications/jse/v4n1/nash.html |
| T/L | I | A ready made spreadsheet for trial and improvement – learners could profitably either use it or "deconstruct" it. (On TRE so registration (free) is required). | http://tre.ngfl.gov.uk/server.php?request=cmVzb3VyY2UuuZnVsbHZpZXc%3D&resourceId=10905 |
| T/L | T | Materials including resource sheets involving data analysis using Excel with well referenced for data to analyse. (On TRE so registration (free) is required). | http://tre.ngfl.gov.uk/server.php?request=cmVzb3VyY2UuuZnVsbHZpZXc%3D&resourceId=11279 |
| L | I | This worksheet and lesson together with a site address for a data set gives learners the opportunity to use the basic statistical functions of Excel. (According to the rubric the activity is aimed at Key Stage 3.) | http://tre.ngfl.gov.uk/server.php?request=cmVzb3VyY2UuuZnVsbHZpZXc%3D&resourceId=9663 |
| L | T | A single page which outlines the elementary functions available in Excel. | http://phoenix.phys.clemson.edu/tutorials/excel/stats.html |
| L | T | A succinct article giving details of how to use the basic statistical functions in Excel. | http://learngen.org/resources/leobjects/lg0037ta.html |

■     **Applications F2O.7d and H2U.8d**     discuss and start to estimate risk

*(**Audience**: **T**eacher **L**earner     **Format**: **I**nteractive, **T**ext based or **V**ideo)*

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| T | T | Suggestions, activities and PowerPoint presentation to support initial foray into probability and risk. | http://www.gsc.org.uk/mathstechnology.aspx |
| T | T | The rules of the game of risk; the game could be used as a starter to a unit on risk and probability. | http://mathforum.org/library/drmath/view/56661.html |
| T | T | These two OU pages and links from them touch upon the perception of risk and set the topic in context – essentially interest/enrichment material. | http://www.open2.net/sciencetechnologynature/maths/risk_notrisk.html<br><br>http://www.open2.net/sciencetechnologynature/maths/risk.html |
| T | T | The source of some interesting articles for teachers on the psychology and sociology of risk and risk management. | http://www.kent.ac.uk/scarr/index.htm |
| T/L | T/V | A very rich resource with a very large number of links, animations, videos and many featured articles. Learners would also benefit from browsing this site. The site has copious (and useful) links as well as articles, blogs, videos and animations. Unlike some other sites it is regularly updated – hence the lack of specific references in this document. | http://understandinguncertainty.org/ |
| T/L | T | A very useful introduction to risk and how individuals perceive it – even when given "neutral" numerical data. Depending on circumstances this, or a précis of it, would make an excellent starter for a whole-group discussion (after reading and pondering on it!) | http://pass.maths.org/issue50/risk/index.html |
| L | T | A good introduction to uncertainty and risk suitable for most learners to browse through. | http://www.risk-ed.org/pages/risk_frameset.htm |
| L | T | A succinct review of all the probability (and a little bit more) that is needed. | http://www.mathagonyaunt.co.uk/mathFrameset.html |

■ **Applications H2H.1d     construct and use flowcharts**

*(**Audience**: **T**eacher **L**earner     **Format**: **I**nteractive, **T**ext based or **V**ideo)*

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| T | T | Merely examples of the numerous pieces of commercial flow charting software available to try. With most a full trial run facility is available but usually the save and/or print facility is disabled. However, a short visit might be useful. | http://flowchart.com/<br><br>http://www.pacestar.com/edge/sample.htm<br><br>http://www.smartdraw.com/sitemap/flowcharts.htm |
| T | T | Some lesson ideas and worksheets but with bias towards system flow charts and ICT.  Might be useful as a basic introduction. | http://www.teachict.com/gcse/theory/flowcharts/teacher/flowchart_lessonideas.htm |
| L | I | Another ICT revision site, but with several "fun" multi-choice games relating to flow charts from the ICT standpoint. | http://www.teachict.com/gcse/theory/flowcharts/student/s_flowcharts_quiz.htm |
| L | I | Several "learning" and testing units, the latter being interactive and produced by CIMT, although stated to be aimed at Y8 they could have wider application. It deals with the actual mechanics of flow charting and also their use as a device for classifying objects. | http://www.cimt.plymouth.ac.uk/projects/mepres/book8/bk8i1/bk8_1i2.htm<br><br>http://www.cimt.plymouth.ac.uk/projects/mepres/book8/bk8i1/bk8_1i3.htm |
| L | I | Free trial flow chart construction software; final efforts may be printed but not saved. | http://www.gliffy.com/flowchart-software/ |
| L | I | The open-software version of Office has some useful ideas for using Draw to draw flow charts. | http://plan-b-for-openoffice.org/draw/index |
| L | T | Systems flow charts – actually an ICT revision site but main features are explained clearly. | http://www.bbc.co.uk/schools/gcsebitesize/ict/measurecontrol/2systemflowchartrev1.shtml |
| L | T | Essentially a revision page, and tends more towards number machines, although it might be useful to link the two depending on circumstances. | http://www.crampuppy.com/1/gcse/mathematics/algebra/flow-charts.shtml |
| L | T | This site, although having an ICT focus, has quite a good short PowerPoint presentation. | http://www.teachict.com/gcse/theory/flowcharts/teacher/flowchart_theory.htm |
| L | T | Essentials of flow charts in a few pages of text. | http://www.mindtools.com/pages/article/newTMC_97.htm |

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| L | T | Instructions as to how to draw a flow chart using shape menu in Word. | http://www.ehow.com/how_4536854_create-flow-charts-using-auto.html |
| L | T | A numerical investigation using a flow chart to generate data hence giving operational practice. | http://nrich.maths.org/5918 |
| L | T | A flow chart for handling fractions – good example of flow charts in action. | http://www.teachertube.com/viewArticle.php?article_id=124&title=Fraction_Flowchart# |
| L | T | A straight forward didactic "How to construct flow charts in Word". | http://www.ehow.com/how_4741383_create-flow-charts-word.html |
| L | T | As above but also in PowerPoint. | http://office.microsoft.com/enus/word/HA010552661033.aspx |
| L | T | As above but in Excel. | http://spreadsheets.about.com/od/tipsandfaqs/f/flowchart.htm |
| L | T | As above but in Draw in OpenOffice. | http://plan-b-for-openoffice.org/draw/index |
| L | T | Quick overview of essentials, three examples and some questions – useful for revision. | http://www.nos.org/htm/basic2.htm |
| L | T | A no-frills instructional set of pages covering all the necessary ground (and perhaps a little more). Some relevant examples and test questions but with a bias towards ICT. | http://www.nos.org/htm/basic2.htm |
| L | V | A 5/6 minute US video giving a good overview of flow charts. Very suited as a comprehensive individual introduction before a unit of work on flowcharts. | http://www.youtube.com/watch?v=DRwtJ1WjzI8 |
| L | V | A brief, two minute, general introduction to flow charting. US origin but covers all the essential points; lecturer is reasonably coherent and clear in his presentation – a good introduction. | http://www.youtube.com/watch?v=xLoL7tlJYws |
| L | V | Three minute video showing how to use graphics capability of Word to draw a flow chart. In addition general "rules" of flow charts are covered (e.g. only two routes out from a decision box). | http://www.youtube.com/watch?v=mXF3ZAYM-KI |

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|---|---|---|---|
| L | V | A short (2 minutes) video showing how to use OpenOffice to draw a simple flowchart – learners may find this rather obvious. | http://www.youtube.com/watch?v=V_vYFioGKEY&feature=PlayList&p=B9982CB098A6C23F&playnext_from=PL&playnext=1&index=7 |
| L | V | Instructional video on how to draw flowcharts. | http://www.youtube.com/watch?v=V_vYFioGKEY&feature=PlayList&p=B9982CB098A6C23F&playnext_from=PL&playnext=1&index=7 |

■ **Applications H2K.1a** **set up and solve problems in linear programming, finding optimal solutions**

*(**Audience**: **T**eacher **L**earner    **Format**: **I**nteractive, **T**ext based or **V**ideo)*

| | | | |
|---|---|---|---|
| T | I | This is a useful PowerPoint (slightly dynamic) presentation of solving a linear programming problem – unfortunately American Imperial units are used. | http://personal.jccmi.edu/BaarsonMonaG/Math%20145%20Notes%20for%20Class/11%20%20Solving%20linear%20programming%20problems%20graphically.pdf |
| T | T | Instructions on how to use Solver in Excel to solve linear programming problems – for the most able. | http://www.economicsnetwork.ac.uk/cheer/ch9_3/ch9_3p07.htm |
| T | T | Another example of using Solver to find solutions to linear programming problems. | http://www.mccd.edu/faculty/powerd/M15/m15_LinProgLab.htm |
| T | T | PowerPoint worked solution to a linear programming problem. | http://www.authorstream.com/Presentation/bsndev-242950-linear-programming-example-2-entertainment-ppt powerpoint/ |
| T | T | Several fully worked problems - would make a useful whole-class presentation.  American units used throughout although this may not be a problem. | http://www.math.ncsu.edu/ma114/PDF/2.2.pdf |
| T | T | Five problems, with handwritten solutions at the end, so could be detached if used with learners. | http://d215buck.edublogs.org/files/2010/04/Linear-Programming-Problems-with-Work.pdf |
| T | T | A problem presented in the form of a supportive writing frame, 4 pages long; a possible homework task. | http://www.hsor.org/downloads/High_Step_Shoes_student.pdf |
| T | T | Terse but comprehensive revision of linear programming. | http://people.richland.edu/james/lecture/m116/systems/linear.html |
| T/L | V | A UK professionally produced video with four case studies using linear programming in "real situation".  A very useful resource either for whole group or small group work. (The site goes onto non-linear programming and other OR techniques but these can obviously be omitted.) | http://www.metalproject.co.uk/METAL/Resources/Films/Linear_programming/index.html |
| L | I | Several problems with optional solutions – useful resource. | http://www.icoachmath.com/sitemap/problemslink.aspx?Search=linear%20programming&grade=0 |
| L | T | Initial page only – setting up the problem. | http://people.brunel.ac.uk/~mastjjb/jeb/or/basicor.html#twomines |

| L | T | Complete guide to linear programming with some additional worked questions. | http://www.purplemath.com/modules/linprog.htm#top |
|---|---|---|---|
| L | T | Four optimisation problems on a worksheet with graphs already drawn – useful support. | http://www.docstoc.com/docs/17830749/Linearprogramming-%E2%80%93-Examples |
| L | T | A worked problem (unit of money is the Rand – but not a problem). | http://www.tutornext.com/linear-programming-example-problems/2353 |
| L | T | Worked linear programming problem with a useful commentary; attempts to make links with "real-life". | http://mathcentral.uregina.ca/beyond/articles/LinearProgramming/linearprogram.html |
| L | T | General overview of how to solve optimisation problems. | http://mathstat.wordpress.com/linear-programming-problems/ |
| L | T | A text-based quick review/revision of linear programming. | http://www.thestudentroom.co.uk/wiki/Revision:Linear_Programming |
| L | T/V | Written working of several examples with link to the video presentation. | http://www.onlinemathlearning.com/linear-programming-example.html |
| L | V | Five minute instructional video on finding regions described by inequalities – good introduction prior to solving linear programming problems. | http://www.youtube.com/watch?v=6oehycq06vo&feature=channel |
| L | V | A fully worked twenty minute linear programming problem beginning with reading and interpreting the actual wordy question. Has an American narrator and uses some American mathematical terms. Nevertheless a useful fully worked solution. | http://www.youtube.com/watch?v=pzgnUCFNN7Q |
| L | V | A ten minute instructional video essentially with a writing hand and accompanying audio; although the units are American/Imperial the commentary is clear and well paced. | http://www.youtube.com/watch?v=M4K6HYLHREQ |
| L | V | A sequence of three instructional videos in which a linear programming problem is solved. All the main terms like objective function are explained and the videos are well paced if sometimes supplemented by some extraneous small movie clips. | http://www.youtube.com/watch?v=LIX28UoegEo&feature=related<br><br>http://www.youtube.com/watch?v=YXDFcIclql4&feature=related<br><br>http://www.youtube.com/watch?v=F8i6zzmoBmA&feature=PlayList&p=F3BEA59294A10298&playnext_from=PL&playnext=1&index=20 |

- **Applications H2N.1b          estimating areas under curves**

*(**Audience**: **T**eacher **L**earner     **Format**: **I**nteractive, **T**ext based or **V**ideo)*

| | | | |
|---|---|---|---|
| T | I | A simple applet allowing the user to approximately find the area under a curve (which may be chosen) by deforming a choice of polygons. Probably most suited as a demonstration or perhaps forming the basis of a homework. | http://www.sci.wsu.edu/math/math107/Learn/Integration/sum.html |
| T | I | More dynamic version of the 1st T/L reference below – does use some calculus vocabulary but this can be ignored especially if used as a demonstration. | http://demonstrations.wolfram.com/CommonMethodsOfEstimatingTheAreaUnderACurve/ |
| T | I | Partition size and number and bounds of area can be changed to see how this effects the approximate area given by summing the rectangular strips – does mention integration but only as giving the exact answers so could in all probability be worked round. | http://www.shodor.org/interactivate/activities/Integrate/ |
| T | T | Text driven trapezium rule (but uses the term Trapezoid; latter parts touch on calculus). | http://business.fortunecity.com/discount/29/areacurvweb.html |
| T | T | Gives starting point as to how to use spreadsheet for the trapezium rule but again in its initial stages it touches on calculus. | http://www.ehow.com/how_5130583_calculate-area-under-curve-excel.html |
| T | T | Shows how to use Excel.  Unfortunately chooses a complicated function outside GCSE but could be adapted. As in many sites, goes on to calculus. However some useful ideas as to how this topic could be presented to learners. | http://www.mathcs.richmond.edu/~caudill/localhome_links/m231/Excel/Integration_Lab4.pdf |
| T | T | A set of 10 questions involving a given (undefined curve) and various sized rectangles to find an approximate area under it. | http://www1.math.american.edu/People/kalman/appcalc/lesson%20plans/wkst9%20area%20under%20curve.pdf |
| T/L | T | A straightforward arithmetic/numerical approach to find area under curves using rectangular approximation.  Latter parts of text move into calculus but the initial part should be accessible to more capable learners. | http://tutorial.math.lamar.edu/Classes/CalcI/AreaProblem.aspx |
| T/L | T | An example of using Excel spreadsheets to find areas under curves – but does mention calculus. | http://people.stfx.ca/bliengme/ExcelTips/AreaUnderCurve.htm |
| L | I | Applet illustrating the effect of reducing width of rectangles to find area under curve. | http://merganser.math.gvsu.edu/calculus/integration/triangle.html |

| | | | |
|---|---|---|---|
| L | I | Useful applet - user can choose function and also width of rectangles. | http://xanadu.math.utah.edu/java/ApproxArea.html |
| L | T | Revision of distance/time graphs concluding with example of trapezium rule being applied; accessible language. | http://www.mathsrevision.net/gcse/pages.php?page=5 |

■ **Methods F1B.3b and H1B.3b** understand and use Venn diagrams and set notation to solve problems

*(**A**udience: **T**eacher **L**earner    **F**ormat: **I**nteractive, **T**ext based or **V**ideo)*

| | | | |
|---|---|---|---|
| T | T | Some quite useful PowerPoint templates. | http://www.presentationmagazine.com/venn-diagram-template-653.htm |
| T | T | A teachers' resource with links showing use of Venn diagrams in other curriculum subjects. Could be a useful source of ideas. | http://classtools.net/samples/venn/ |
| T | T | A useful page with many references to other sites, mainly text based, of interest. | http://mathforum.org/library/drmath/sets/select/dm_venn.html |
| T | T | Essentially a downloadable set of work sheets with problems relating to Venn diagrams, prefaced with a brief overview. | http://mathsteaching.files.wordpress.com/2008/02/venn_diagrams_intro.pdf |
| T | T | A useful, but advanced, source of sites giving the history and background to Venn diagrams. | http://sue.csc.uvic.ca/~cos/venn/VennEJC.html |
| T | T | A selection of "Ask Dr. Math" Q/A involving Venn diagrams – a helpful teachers' resource. | http://mathforum.org/library/drmath/sets/select/dm_venn.html |
| L | I | Some **primary** level interactive whiteboard files on Venn diagrams on the National Strategy site. | http://nationalstrategies.standards.dcsf.gov.uk/node/47034 |
| L | I | Sorting (and checking) shapes from a menu of properties into a Venn diagram – fairly basic. | http://illuminations.nctm.org/ActivityDetail.aspx?ID=34 |
| L | I | A simple activity involving placing numbers in the correct region (choices are "marked"). Probably only of use as a very low level introduction to sets and Venn diagrams with its focus on sorting. | http://www.teacherled.com/resources/vennmultiples/vennmultipleload.html |
| L | I | The user decides lists and the applets construct Venn diagrams for 3 and 4 circle situations – useful as a class demo or for experimentation by learners. | http://www.pangloss.com/seidel/Protocols/venn.cgi |
| L | I | A quiz in which the user has to indicate the area of the given Venn diagram when presented with regions in set form - mainly involved with classifying objects. The user's efforts are marked and a score given. The home page of this site has a wide range of lesson plans and discussion ideas. It is regularly updated. | http://www.shodor.org/interactivate/activities/VennDiagrams/ |

| L | I | A simple interactive test in which users place numbers in the appropriate regions of a Venn diagram. | http://www.cimt.plymouth.ac.uk/projects/mepres/book7/bk7i1/bk7_1i3.htm |
|---|---|---|---|
| L | I | Fairly straightforward text based instructional unit with interactive quiz. | http://www.cimt.plymouth.ac.uk/projects/mepres/book7/bk7i1/bk7_1i3.htm |
| L | I | Users select the region given in set notation and the applet shades the appropriate region. The first site uses two "hoops", the second uses three. Could be used in a game situation by a pair of learners or as a whole-group activity. | http://www.waldomaths.com/Venn1NL.jsp<br><br>http://www.waldomaths.com/Venn2NL.jsp |
| L | I | A fairly basic applet in which the user selects the number of elements in the intersection of two sets and the number exclusively in each set – the applet then draws the relevant Venn diagram. Useful as learners can check their own answers. | http://jura.wi.mit.edu/bioc/tools/venn.php |
| L | I | Quick test on Venn diagrams (automatically marked) mainly identifying members in certain groups defined in set notation; a useful revision source. | http://www.math.csusb.edu/notes/quizzes/venn1/venn1.html |
| L | I | A selection of problems – some quite challenging - involving using Venn diagrams.  Solutions are provided by a video feed. | http://www.math.tamu.edu/~kahlig/venn/venn.html |
| L | I | A simple applet showing the addition rule for probability in terms of a Venn diagram. | http://www2.spsu.edu/math/deng/m2260/stat/venn2/prob.html |
| L | I | Interactive solving of a Venn diagram problem based on C&W songs.  Fun but the sound might be considered somewhat annoying. | http://math.uww.edu/faculty/mcfarlat/country.htm |
| L | I | Interactive quiz on identifying regions of a Venn diagram given the set notation describing them. | http://nlvm.usu.edu/en/nav/frames_asid_153_g_3_t_1.html?open=instructions |
| L | I | A quirky applet that plots a Venn diagram based on frequency of three chosen words in Twitter. | http://www.neoformix.com/Projects/TwitterVenn/view.php |
| L | T | A good source of further reading for the most capable including treatment of syllogisms; goes further than is demanded by the specification on the logic aspects of Venn diagrams. | http://www.cut-the-knot.org/LewisCarroll/VennDiagrams.shtml |
| L | T | Two investigations based on the use of Venn diagrams from Nrich. | http://nrich.maths.org/794<br><br>http://nrich.maths.org/675 |

| | | | |
|---|---|---|---|
| L | T | A good overview of Venn diagrams including the use of them to solve problems involving sets. A useful text-based resource for learners. | http://www.purplemath.com/modules/venndiag.htm |
| L | T | A text-based solving of a problem involving Venn diagrams based on Disney characters. | http://www.chaselink.com/tune/ |
| L | T | A fairly fast review of Venn diagrams and set notation – some pre-knowledge is probably needed (but site could be useful for revision) – ending in several problems (and their solutions) relating to Venn diagrams. | http://www.saskschools.ca/curr_content/mathb30/prob/les2/notes.html |
| L | T | A pacey text-based overview – the last page of which is well above the present demands but the previous pages are useful. | http://planetmath.org/encyclopedia/VennDiagram.html |
| L | V | A very basic animation showing various regions given in set notation. | http://www.trinity.nottingham.sch.uk/maths/statistics/prob/venn.html |
| L | V | A basic two minute introduction to what a Venn diagram is; no set notation is used, just the idea of overlap and sets being a collection of objects. | http://www.youtube.com/watch?v=zFa640SQ-sI |
| L | V | Short two minute lecture video which introduces the main features of set notation although some of this is not quite standard (possibly US variation).  Despite this, quite useful. | http://www.ehow.co.uk/video_4756723_using-set-notation.html |
| | V | A two minute lecture on the basics of Venn diagrams. | http://www.onlinemathlearning.com/venn-diagrams.html |

■ **Methods F1M.1l and H1O.1a** understand and use vector notation for translations

(**Audience**: *Teacher Learner*    **Format**: *Interactive, Text based or Video*)

| | | | |
|---|---|---|---|
| T | T | TRE (free registration required) gives an overview of vectors, including notation, perhaps a little more than required here. Included is a PowerPoint presentation with some Q/A, worksheet and lesson plans. | http://tre.ngfl.gov.uk/server.php?request=cmVzb3VyY2UuZnVsbHZpZXc%3D&resourceId=1210 |
| T | T | Interactive PowerPoint presentation (TRE): covers translation, reflection, rotation and enlargement. Works best when projected onto a whiteboard (not necessarily an interactive one) but can also be viewed/used on screen by individuals. | http://tre.ngfl.gov.uk/server.php?request=cmVzb3VyY2UuZnVsbHZpZXc%3D&resourceId=15262 |
| T | T | Lesson plans, two PP presentations and some activities. The site also gives links to other transformations. | http://www.teachnet-uk.org.uk/2006%20Projects/Maths-Transformations/Tristan%20Jones/translations.htm |
| T/L | I | An interactive whiteboard resource.  Clicking on one of the shape buttons displays the corresponding shape in a random position.  A set of instructions for translating this shape will also appear on the screen and is effectively "marked" right or wrong depending on the user's plotting of the transformed vertices – useful as a snappy whole-group activity. | http://www.teacherled.com/resources/translation/translationload.html |
| T/L | I | Free download of Mathematica Reader allowing the saving of any Wolfram applets also listed on the site. | http://demonstrations.wolfram.com/index.html |
| T/L | T | Basically an information sheet covering all the content concluding with the addition of two translations (vectors). | http://www.benjamin-mills.com/maths/Year11/translation.pdf |
| T/L | V | A one minute long silent animation showing the translation vectors needed to make mappings from a collection of triangles. | http://www.youtube.com/watch?v=zB0bQZHOnu0&feature=related |
| L | I | Four pages with an applet using a translation vector that can also be controlled to show effect of the translation on a dot or shape. | http://oneweb.utc.edu/~Christopher-Mawata/transformations/translations/lesson3.html |
| L | I | An applet in which a triangle is translated by altering the translation vector. | http://www.briantaylor.ca/geogebra/translation.html |

| L | I | A set of five interactive activities/quizzes related to translations – American so tends to use words like "pre-image" and to use a row matrix rather than a column matrix to define a translation. (Other transformations are treated on separate activities). | http://enlvm.usu.edu/ma/nav/toc.jsp?sid=__shared&cid=emready@transformations&cf=activity |
|---|---|---|---|
| L | I | A board game, shown in PowerPoint , involving translations and using snakes and ladders as the vehicle. | http://www.tes.co.uk/article.aspx?storycode=6030422 |
| L | T | Bitesize has just one page in a unit on transformations in general giving the bare bones; suitable for revision only. | http://www.bbc.co.uk/schools/gcsebitesize/maths/shapes/transformationsrev2.shtml |
| L | V | A three minute instructional video, produced in the UK , clearly covering all the basics – good. | http://www.youtube.com/watch?v=ycrpdvEsjh0 |
| L | V | An effective ten page, silent, animated presentation making clear what a translation is and how it may be described by a column vector. | http://www.authorstream.com/Presentation/suef-158600-translations-maths-middle-school-education-ppt-powerpoint/ |
| L | V | Free if viewed online – but cannot be saved – simple but very useful animation treating translations and how to describe them using column vectors. | http://www.absorblearning.com/media/item.action?quick=ie |

■ **Methods F1O.1i and H1Q.1k** use Venn diagrams to represent the number of possibilities and hence find probabilities

*(**A**udience: **T**eacher **L**earner    **F**ormat: **I**nteractive, **T**ext based or **V**ideo)*

| | | | |
|---|---|---|---|
| L | I | Users can move around the regions representing events A and B and see how the sets and various probabilities change – possibly for the most capable | http://www.stat.tamu.edu/~west/applets/Venn1.html<br><br>http://www.stat.berkeley.edu/~stark/Java/Html/Venn.htm |
| L | I | An interactive applet where the user is able to adjust the Venn diagram and observe the effect on various probabilities – labelled using set notation. | http://www.stat.berkeley.edu/~stark/Java/Html/Venn.htm |
| L | I | Selection from a menu in set notation is given and the area and what probability it represents is stated.<br><br>This applet is similar, but marginally less attractive. | http://www.cardiff.ac.uk/maths/teaching/probability/probtheory/venn/<br><br>http://www.bolderstats.com/gallery/prob/venn.html |
| L | T | A quick, text-based, overview of the main features and notation employed when using Venn diagrams in probability. | http://www.statistics-help-online.com/node9.html |
| L | T | Direct and brief introduction to the use of Venn diagrams in probability. | http://www.quickmba.com/stats/probability/ |
| L | T | Two worked examples. | http://www.williamhoward.cumbria.sch.uk/Intranet/Maths/KS4maths/statistics/Venn_Diagrams_and_Probability.doc |
| L | T | Useful worked example but on several occasions tends to use odds rather than probabilities – use with care but useful nevertheless. | http://online.morainevalley.edu/websupported/jsukta/handouts/solutions__venn_diagram.htm |
| L | T | Covers all the necessary content quite quickly so possibly more suited to a revision session. | http://www.mathsrevision.net/alevel/pages.php?page=66 |
| L | T | A couple of worked examples calculating probabilities via Venn diagrams – a little limited but might be useful as a starting point. | http://cnx.org/content/m16848/latest/ |
| L | T | A short page reviewing the "rules" of probability from the Venn diagram standpoint together with some questions. | http://library.thinkquest.org/11506/prules.html |

| L | T | A quick review of probability and Venn diagrams. | http://www.quickmba.com/stats/probability/ |
|---|---|---|---|
| L | V | A ten minute video dealing with conditional probability – a useful adjunct – uses real situations: O J Simpson trial defence. | http://www.youtube.com/watch?v=4PwnvqGEHoU&feature=related |
| | | A four minute animated lecture – very clear and well presented. | http://www.youtube.com/watch?v=vhToKaPwKE4&feature=related |
| | | Another four minute animated video using Venn diagrams in conditional probability – useful in conjunction with above. | http://www.youtube.com/watch?v=bLNfsh8Ax38&feature=related |

- **Methods F2L.2c and H2M.3c** solve problems in the context of tiling patterns and tessellation

*(**Audience**: **T**eacher **L**earner    **Format**: **I**nteractive, **T**ext based or **V**ideo)*

| | | | |
|---|---|---|---|
| T | T/I | A very useful starting point with many links to other resources including lesson plans and general suggestions. | http://mathforum.org/sum95/suzanne/whattess.html<br><br>http://mathforum.org/sum95/suzanne/tess.intro.html<br><br>http://mathforum.org/sum95/suzanne/links.html |
| T | T/I | A good starting point including notes for teachers ( http://gwydir.demon.co.uk/jo/tess/teacher.htm ) and also: | http://gwydir.demon.co.uk/jo/tess/<br><br>http://www.ics.uci.edu/~eppstein/junkyard/tiling.html |
| T | T/I | A very rich source of links relating to tessellations and tilling including historical aspects and the work of Escher.<br><br>A useful site but perhaps marginally less comprehensive than the above. | http://library.thinkquest.org/16661/sitemap.html<br><br><br>http://www.tessellations.org/index.htm |
| T | T/I | A site with several very useful links to other relevant sites including several for lesson plans. | http://www.emints.org/ethemes/resources/S00000511.shtml |
| T | T/I | A very useful freeware program having applications in symmetry, tessellation work and algebra (to mention only three). There is a good support base.<br><br>A useful introduction to GeoGebra may be found here. | http://www.geogebra.org/cms/<br><br><br><br>http://www.mrlsmath.com/wpcontent/uploads/2008/10/GeoGebra-Quickstart.pdf |
| T | T | A comprehensive overview of tilling patterns and spatial patterns in general. | http://www2.spsu.edu/math/tile/index.htm |
| T | T | A general over-view of tilling and symmetry with several useful links. | http://www.scienceu.com/geometry/articles/tiling/ |
| T | T | Some quite useful (American) lesson plans probably requiring more time than might be available but giving a useful overview as to how the topic of tessellation might be addressed. | http://mathcentral.uregina.ca/rr/database/rr.09.96/archamb1.html |

| T/L | T | A 32 slide presentation, well illustrated, dealing with the basic geometrical aspects of tessellations (including vertex notation which is probably a shade further than needed). | http://www.docstoc.com/docs/516741/Tessellation/ |
|---|---|---|---|
| L | I | This interactive site lets the user draw a shape, choose three colours, then click "Tessellate" to see the pattern formed. Clicking on the "What," "How," and "Why" buttons at the top gives more information. A useful starter activity. | http://www.shodor.org/interactivate/activities/Tessellate/ |
| L | I | Five multi-choice questions that could form the basis of a revision/discussion session. | http://www.math6.org/geometry/7.12_extension.htm |
| L | I | A (free) Java program that allows the user to draw symmetrical patterns based on any of the 17 wallpaper groups as well as several frieze and rosette groups – useful for general discussions on symmetry. | http://www.geom.uiuc.edu/java/Kali/ |
| L | I | Tessellation generation from a menu of given polygons. | http://illuminations.nctm.org/ActivityDetail.aspx?ID=202 |
| L | I | A short applet involving the user making tessellations from a menu of polygons. | http://nlvm.usu.edu/en/nav/frames_asid_171_g_3_t_3.html |
| L | I | An applet which generates tessellations based on a shape input by the user.<br><br>A similar applet but leaning more towards transformations. | http://www.shodor.org/interactivate/activities/Tessellate/<br><br>http://nlvm.usu.edu/en/nav/frames_asid_309_g_4_t_3.html |
| L | I/T | A useful introduction to tessellations and conditions for polygons to tessellate – accessible to most learners, bright and breezy. | http://www.coolmath.com/lesson-tessellations-1.htm |
| L | T | A short review covering most of the content required. | http://www.karenvagts.com/kvtessellations1.html |
| L | T | An effective introduction to the geometry behind tessellations. | http://math4allages.wordpress.com/2010/03/05/tessellation-mathematics-of-tiling/ |
| L | V | A basic five minute video showing how Paint may be used to generate tessellations (perhaps better used without the background music!)<br><br>Similar to the above but with a commentary. | http://www.youtube.com/watch?v=f9ydf_VfjTM<br><br>http://www.youtube.com/watch?v=RsBPPmGTKiU&feature=related |

■ **Methods H2K.3d** **understand and use the Cartesian equation of a circle centred at the origin and link to the trigonometric functions**

(**A**udience: **T**eacher **L**earner     **F**ormat: **I**nteractive, **T**ext based or **V**ideo)

| | | | |
|---|---|---|---|
| T/L | I | A TRE 9 (so free registration needed) Excel program involving moving round unit circle – cosine and sine calculated and shown on sine and cosine curve (in fact an AS activity but suitable here). It shows the links between the unit circle and the trig. functions/graphs. | http://tre.ngfl.gov.uk/server.php?request=cmVzb3VyY2UuZnVsbHZpZXc%3D&resourceId=15612 |
| | | Finds  Sin, Cos, Tan, Cosec, Sec, and Cot for any angle on the unit circle, radians and degrees, and can snap to special anglers like 30°, 60°, 45° etc. | http://mste.illinois.edu/users/pavel/java/unitcircle/ |
| | | As above but the radius may be altered to show that trig. functions are ratios – could be useful reinforcement as learners tend to forget the ratio "nature" of trigonometry. | http://id.mind.net/~zona/mmts/trigonometryRealms/TrigFuncPointDef/TrigFuncPointDefinitions.html |
| T/L | I | Covers most of trigonometry. A useful resource with an adjustable unit circle and some background history but it does tend to drift into radians as a measure of angle. Useful to browse for the most capable. | http://www.clarku.edu/~djoyce/trig/ |
| T/L | I | Challenging; Uses degrees and radians plus all six trig. functions. The site has questions with answers revealed by clicking and clickable help for vocabulary (such as radian etc.) This is also useful as the site tends to use American terms such as "standard position". Could make the case that it would be useful for independent learning and "finding out". | http://www.themathpage.com/atrig/unit-circle.htm |
| T/L | I | Another moving point round unit circle, values of trig functions worked out and shown (although all six may be shown a choice can be made as to which). | http://www.ies.co.jp/math/java/trig/sixtrigfn/sixtrigfn.html |
| T/L | V | 10 minute video covering unit circle trig. functions.  Contains the odd corrected slip; it's not slick but fit for purpose – reasonable space, clear. Very natural but does tend to use radians, also minor aspect problems as circles are not always circular. | http://www.youtube.com/watch?v=ZffZvSH285c |

| | | | |
|---|---|---|---|
| T/L | V | A seven minute instructional video, odd slips corrected, dealing with the unit circle. Uses radians but does trig. functions of angles 0° to 360°. | http://www.youtube.com/watch?v=cIVpemcoAlY&feature=related |
| T/L | V | Two minute silent animation – but works in radians – first quadrant only.<br><br>As above but with addition of the second quadrant. | http://www.youtube.com/watch?v=DCoxWzOfngE&feature=related<br><br>http://www.youtube.com/watch?v=Bi8CxQdwF-A&NR=1 |
| L | I | Not all graph plotters allow the plotting of implicit functions such as the standard equation of a circle. This free on-line, easy and intuitive to use graph plotter gives learners the opportunity to experiment with circles. | http://www.flashandmath.com/mathlets/calc/implicit/implicit.html |
| L | I | This allows the radius and centre of a circle to be altered whilst giving the equation of the resulting circle – the inverse of the | http://www.mathwarehouse.com/geometry/circle/equation-of-a-circle.php |
| L | I | Similar to the above but with centre fixed on the origin.  Equation of the circle can be revealed after inputting the radius so is useful for whole-group work using a PC projector or smart board. | http://www.meidistance.co.uk/flash/ascgc1ai.html |
| L | I | Two Nrich investigations using a "trig protractor" involving moving a point round the circumference of circle – essentially unit circle but users have to work out what is happening – suitable for a more open-ended style. | http://nrich.maths.org/public/viewer.php?obj_id=5601&part=<br><br>http://nrich.maths.org/6084 |
| L | V | US video, 6 minutes long, working through questions related to circles with centre at the origin.   Does not touch on trigonometry but does take as a starting point the equation $d = \sqrt{((x_1 - x_2)^2 + (y_1 - y_2)^2)}$. | http://www.youtube.com/watch?v=HjN9TTRrQiA |
| L | V | A two minute instructional video working through some standard problems with circle centre at the origin – a "writing hand" with commentary. | http://www.youtube.com/watch?v=cQUEKRzN7C0 |
| L | V | A nine minute instructional video revising the trig. functions defined on a coordinate grid.  Uses terms such as "standard position" and "terminal side" but the meaning of these is almost self-evident from the graphics. Surds and simplifying expressions involving surds feature towards the end. All six trig. functions are treated. | http://www.youtube.com/watch?v=xNDuLeinf4M |

| L | V | A two minute instructional video dealing with trig. ratios on the unit circle - just the positive quadrant. Being American some "different" words are used such as "terminal line". However a moderately clear introduction to trig. ratios within the context of the circle; no mention is made of the equation of a circle. | http://www.youtube.com/watch?v=bGPxA8rQFkw |
|---|---|---|---|

■    **Methods H2M.4a        understand and use the midpoint and the intercept theorems**

*(**Audience**: Teacher Learner     **Format**: Interactive, **T**ext based or **V**ideo)*

| | | | |
|---|---|---|---|
| T/L | T | Effectively eight pages from a text book but comprehensively covering the content with a focus on proof; includes some questions and number of worked proofs. A useful resource. | http://staff.tpjcian.net/tay_boey_yiong/H3%20Maths/Chapter%202%20OHT.doc |
| T/L | T | A rather neat proof of the intercept theorem – scrutiny of which would make a useful short discussion. | http://planetmath.org/?op=getobj&from=objects&name=InterceptTheorem |
| T/L | T | A PowerPoint presentation proving the midpoint theorem together with some pointers regarding proof in general, some questions and in addition some worked proofs. Originally designed for a particular class – there are some specific references to this – but this does not detract from the main thrust of the presentation. | http://www.google.co.uk/url?sa=t&source=web&ct=res&cd=5&ved=0CCwQFjAE&url=http%3A%2F%2Fmath.nie.edu.sg%2Fdszhao%2Fplanegeometry%2Fppt%2Fpresentation_1.ppt&ei=jFLoS5-bCY3-0gSGpLzUBg&usg=AFQjCNF9uWVBgG_f9wKowzA5XBUOts4Ipw&sig2=9eJkOs3WowIzMm5J_ep6yw |
| L | I | Animation giving the mid-point of a line segment whilst user alters the length and orientation of the line stressing that showing a large number of examples does not constitute a proof. | http://www.mathopenref.com/coordmidpoint.html |
| L | T | Statement of the triangle intercept theorem and hint as to how to prove it (similar triangles) – a possible homework task? | http://www.mathsrevision.net/gcse/pages.php?page=28 |
| L | T | A comprehensive list of all the theorems/results and some proofs including the midpoint and intercept theorems. | http://cnx.org/content/m32650/latest/ |
| L | T | Single page proving the mid-point theorem. | http://www.cliffsnotes.com/study_guide/The-Midpoint-Theorem.topicArticleId-18851,articleId-18799.html |
| L | T | Proof of the theorem but with several questions – proof in general.<br><br>(For completeness – this article gives proof of all the relevant circle theorems). | http://www.tutorvista.com/content/math/geometry/midpoint-theorem/midpoint-theorem.php<br><br>http://www.benjamin-mills.com/maths/Year11/circle-theorems-proof.pdf |
| L | V | This particular video requires iTunes program available via free download. Effectively a ten minute video of a lecture with clear presentation. Several other (free) videos are given on the site. | http://itunes.apple.com/us/podcast/id298172922 |

- **Methods H2M.5a** understand and construct geometrical proofs using formal arguments, including proving the congruence or non-congruence of two triangles in all possible cases

(*Audience*: *T*eacher *L*earner    *Format*: *I*nteractive, *T*ext based or *V*ideo)

| | | | |
|---|---|---|---|
| T | T | There are several articles relating to proof on the Nrich site including:<br>Proof by contradiction, for the more capable<br><br>Another guide to prove Pythagoras<br><br>Investigation hinging on algebraic proof<br><br>Article on proof<br><br>Article on history of proof<br><br>Article on proof. | http://nrich.maths.org/4717<br><br>http://nrich.maths.org/811<br><br>http://nrich.maths.org/5675<br><br>http://nrich.maths.org/6664<br><br>http://nrich.maths.org/5996<br><br>http://nrich.maths.org/1387 |
| T | T | A collection of work sheets – some not suitable but they do give learners a feeling as to what is required in a proof. Individual ones may be used depending on circumstances. | http://agmath.com/media/DIR_12306/13$20Proofs.pdf |
| T | T | Useful resources with Q/A sent in by, mainly American, students about two column proofs. | http://mathforum.org/dr.math/faq/faq.proof.html |
| T | T | Euclid's Elements: it might be appropriate to dip into out of interest and there is some small degree of interactivity. | http://aleph0.clarku.edu/~djoyce/java/elements/toc.html |
| T | T | A collecting of over 400 "results to be proved" (no solutions provided), many too challenging, but some (the earlier ones) could make the basis of brainstorming/discussion activities. | http://www.gogeometry.com/problem/all_geometry_problems.html |
| T | T | A well referenced, albeit slightly old (2003), paper discussing students' difficulties with proof. | http://www.maa.org/t_and_l/sampler/rs_8.html#Jo |
| T | T | An approach to proof adopted in some American establishments included for completeness. | http://www.mdk12.org/share/clgtoolkit/lessonplans/MethodsofProofFlowChartProofs.pdf |

| | | | |
|---|---|---|---|
| T | T | A class activity designed to assist learners and to give them practice in putting together a proof. The angle and congruency notation is that used in America however the resource sheets could be Anglicised. | http://illuminations.nctm.org/LessonDetail.aspx?id=L727 |
| T | T | These are two chapters, including resource sheets from a free e:book ( http://agmath.com/1973.html ). Unfortunately some of the geometrical notation is American but this could be re-written into a form familiar to learners.

Congruent triangles and proof.
More proof. | http://www.agmath.com/media//DIR_12306/4$20Triangles$20Proofs.pdf

http://www.agmath.com/media//DIR_12306/13$20Proofs.pdf |
| L | I | For the more capable - an interactive activity to sort the steps in the completion of the square into the correct order to prove the formula for the solutions of quadratic equations. | http://nrich.maths.org/1394 |
| L | I | Examples and interactive versions of two column proofs (several of each). | http://www.mathwarehouse.com/geometry/congruent_triangles/isosceles-triangle-theorems-proofs.php |
| L | I | This applet allows the construction of two triangles from various combinations of sides and angles using the four conditions of congruency. | http://nlvm.usu.edu/en/nav/frames_asid_165_g_3_t_3.html?open=instructions&from=category_g_3_t_3.html |
| L | I | A set of multi-choice questions relating to congruent triangles (with optional hints). | http://www.glencoe.com/sec/math/studytools/cgibin/msgQuiz.php4?isbn=0-07-829637 4&chapter=4&headerFile=4&state=& |
| L | I | A set of multi-choice questions relating to congruent triangles (with hints given for wrong answers). | http://www.funtrivia.com/playquiz/quiz20769517c8210.html |
| L | I | This site contains several video lectures relating to proof; being American some of the terms used are slightly different to ones used in the UK; however they are fairly well produced. (Not all these videos can be downloaded.) | http://www.onlinemathlearning.com/geometry-proofs.html |
| L | I | Interest calculator on a mortgage with facility to show home mortgage calculations and loan amortisation – but works in $s. | http://www.quoteserv.com/mortgage/mortgage_calculator.php |

| L | I/T | These sites give various proofs of Pythagoras. | http://nrich.maths.org/6553 |
| | | | http://www.mathsnet.net/dynamic/pythagoras/index.html |
| | | Well over 50 proofs of Pythagoras are presented on this site. | http://www.cut-the-knot.org/pythagoras/index.shtml |
| L | T | Two very challenging proofs but no solution – only hints.  Suitable for the most capable – also included are a few useful notes on proof. | http://thinkzone.wlonk.com/MathFun/Triangle.htm |
| L | T | A comprehensive treatment of proof suitable for the more capable. | http://www.sparknotes.com/math/geometry3/geometricproofs/ |
| L | T | Bare bones as to what constitutes a geometric two column proof for the more capable. | http://www.dummies.com/how-to/content/mastering-the-formal-geometry-proof.html |
| L | T | Didactic – how to write a two column proof. | http://www.wikihow.com/Write-a-Congruent-Triangles-Geometry-Proof |
| L | T | Overview of proof, with eight standard two column proofs, some of which might be a challenge. | http://library.thinkquest.org/2647/geometry/intro/proof.htm |
| L | T | List of the basic theorems needed – useful reference list (the last two are not relevant). | http://www.gogeometry.com/problem/key_theorems.htm |
| L | V | A five minute video lecture on the basics of geometric proof (American). | http://www.ehow.com/video_4975006_introducingstepbystep-geometrical-proof.html |
| L | V | A 10 minute video lecture on proof by contradiction working through several questions.  Some images, particularly the writing, are not 100% clear however the commentary alleviates this to an extent. | http://www.youtube.com/watch?v=u6O0YHyarlI |
| L | V | A 12 minute video lecture working though several proofs; a somewhat informal American approach but surprisingly clear. | http://www.youtube.com/watch?v=4PPMnI8Zsc&feature=channel |
| L | V | A PowerPoint presentation on congruent triangles with a streamed video link (not of the highest quality – based on handwritten material). | http://www.authorstream.com/Presentation/zogase-289654-geometric-proof-powerpoint-education-ppt/ |

| L | V | This two minute video lecture covers the steps to follow to write a 2-column proof in geometry. It is a good introduction to proofs and the underlying concepts but no actual examples are shown. | http://www.mathvids.com/lesson/mathhelp/616-introduction-to-proofs |
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| L | V | A six minute animation about congruent triangles (SAS, SSS, ASA).  Although made in the late 1970s it makes its points clearly by using a very simple animation. | http://www.gogeometry.com/geometry/congruent_triangle_journey_1977.htm |