GCSE Mathematics
Post-16 1-year resit: Preparing to teach

Julia Smith
Autumn 2017

Agenda

- Welcome
- The context of GCSE resits in a post-16 setting
- An overview of the new GCSE
- Key features of a revision year approach
- Top tips, key resources and revision techniques
- Using the AQA practice papers, sample assessment material, topic tests and milestones
- Identifying next steps
- Support from AQA

The context of a post-16 GCSE resit

The Wolf Report

Recommendation 9

Students who are under 19 and do not have GCSE A*–C in English and/or Maths should be required, as part of their programme, to pursue a course which either leads directly to these qualifications, or which provides significant progress towards future GCSE entry and success.

Recommendation 10

DfE should continue and, if possible, increase its current level of support for CPD for mathematics teachers, and give particular attention to staff who are teaching post-16 students in colleges and schools.

Considerations

- Results
- Attendance
- Recruitment
- Class size
- Behaviour
- CPD
- Ofsted
- The new GCSE

The students

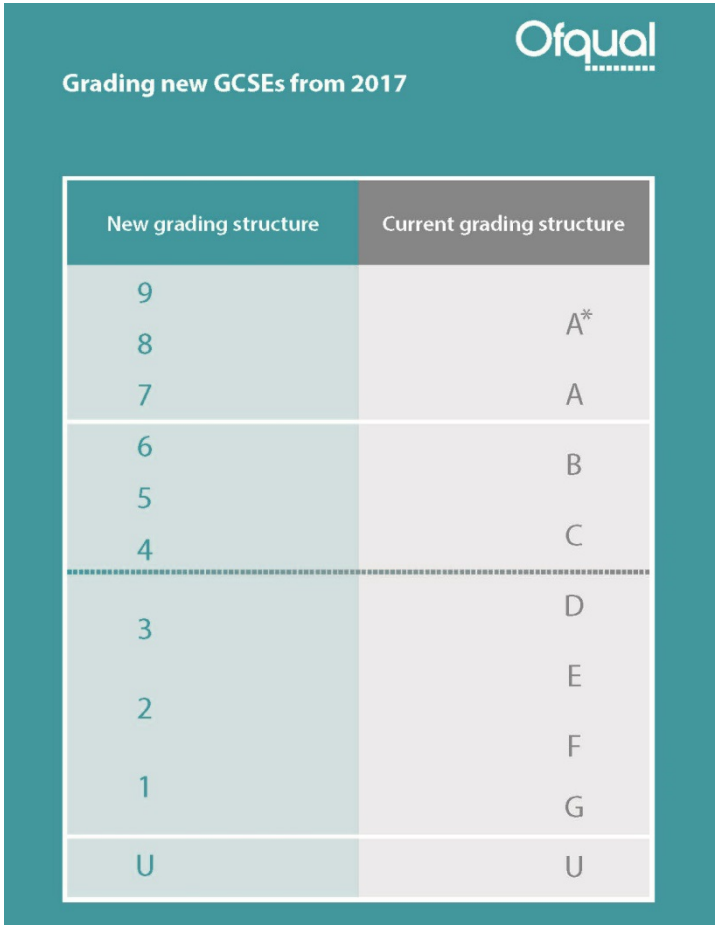
- They have seen all the maths before over a number of years.
- They can do some maths but they can’t do other bits.
- They will have forgotten stuff since June.
- Some will have resat multiple times.
- Some will have grade 3 and some will have grade D.
- They don’t feel too good about this.

Who will you be teaching?

- Condition of funding has been agreed.
- Students achieving grade 3 are required to resit.

However:

- grade 5 is a good pass for school
- a good pass is potentially required for university
- grade 4 students may want/need to resit
- grade 3 students are more E grade ability.



This graphic is lifted directly from Ofsted's Grading for new GCSEs from 2017, available in full at: gov.uk/government/publications/your-qualification-our-regulation-gcse-as-and-a-level-reforms. This contains public sector information licensed under the Open Government License v.3.0.

The new GCSE specification

Philosophy from DfE/Ofqual

- New content (all tiers).
- Longer assessment time (4.5 hours).
- Additional content in the Foundation tier.
- Students need to know more formulae.
- Less assessment of straight recall.
- Change in assessment objectives to make papers more demanding.

AQA specification at a glance

Paper 1: non-calculator	Paper 2: calculator	Paper 3: calculator
Content • Content from any part of the specification may be assessed	**Content** • Content from any part of the specification may be assessed	**Content** • Content from any part of the specification may be assessed
Assessment • 1 hour 30 minutes • Written exam • 80 marks • 33.3% of GCSE	**Assessment** •1 hour 30 minutes • Written exam • 80 marks • 33.3% of GCSE	**Assessment** •1 hour 30 minutes • Written exam • 80 marks • 33.3% of GCSE

- Students will be required to answer all questions on all papers.
- The assessment structure will be the same for Foundation and Higher tiers.

Specification content

The mathematical content is defined by the DfE's *GCSE subject content and assessment objectives* document.

Subject area	Foundation tier weighting	Higher tier weighting
Number	25% (35%)	15% (17%)
Algebra	20% (17%)	30% (35%)
Ratio, proportion and rates of change	25% (subsumed in other areas)	20% (subsumed in other areas)
Geometry and measures	15% (28%)	20% (28%)
Probability and statistics	15% (20%)	15% (20%)

(Figures in brackets show approximate weightings for the current qualification)

Assessment objectives

- AO1: Use and apply standard techniques.
- AO2: Reason, interpret and communicate mathematically.
- AO3: Solve problems within mathematics in other contexts.

Formulae

- Restrictions on which formulae can be given (see specification appendix and formulae poster for details).
- AQA have decided that formulae that can be given will be given in the question and not in a separate formulae sheet.

Content changes

Content changes

Five types:

- modified (eg up to 12 times table)
- added to Foundation tier (eg standard form)
- new to Foundation and Higher tiers (eg frequency trees)
- new to Higher tier only (eg area under a curve)
- gone (eg stem and leaf).

Modified content

Some content:

- is more explicitly stated, but may have been implied previously
- results from more assumed knowledge from earlier key stages.

For example:

- Key Stage 2 requires knowledge up to 12 times table
- unique factorisation theorem
- limits of accuracy
- acceleration
- sequences of triangular, square and cube numbers
- ideas of randomness
- outliers
- expansion of more than two binomials.

Content added to Foundation tier

Some content:

- was previously Higher tier only
- is new content.

For example:

- calculations and answers in terms of π standard form
- inequality notation in error intervals
- surds
- reciprocal graphs
- expanding and factorising quadratic expressions
- solving quadratic equations by factorising
- equations of parallel lines
- simultaneous equations
- density
- direct and inverse proportion (including graphical and algebraic representations)
- similar shapes (including trig ratios).

Content added to Foundation tier continued

- trigonometry
- congruence (SSS, SAS, ASA, RHS)
- enlargement with fractional scale factors
- surface area and volume of spheres, pyramids, cones and composite solids
- arc length
- area of a sector

Content new to Foundation and Higher tiers

Some content is new to both tiers.

For example:

- systematic listing strategies
- Fibonacci type sequences
- quadratic sequences
- simple geometrical progressions
- pressure
- functions
- frequency trees
- Venn diagrams.

Content new to Higher tier only

Some content is completely new but in the Higher tier only.

For example:

- inverse functions
- composite functions
- graph of $y = \tan x$
- velocity-time graphs
- areas under graphs
- equation of a circle/tangent
- quadratic inequalities
- other sequences
- nth term of a quadratic sequence
- rates of change
- iterative processes
- invariance
- equation of perpendicular line.

Content not in the specification

Some content is no longer included in the specification.

For example:

- stem and leaf diagrams
- questionnaires and surveys
- ‘chance’ words
- imperial to metric conversion factors
- trial and improvement
- reference to the data handling cycle
- named sampling methods
- transformations $y = af(x)$ and $y = f(ax)$
- 3D coordinates.

Key features of a revision year

The scheme of work has to have some key features and be presented in a different way.

What didn’t work before will not work again!

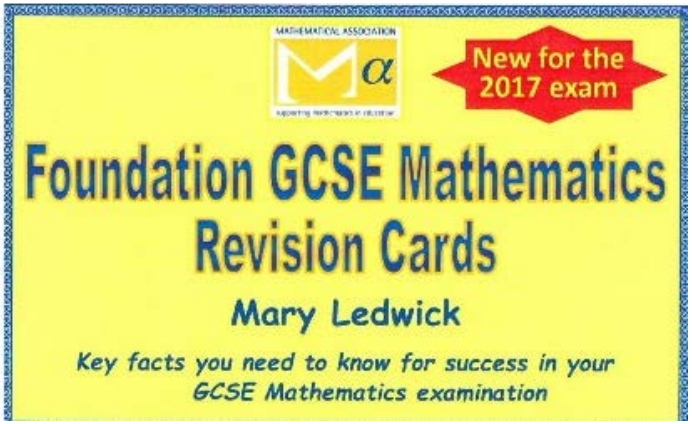
It has to look different.

- Recall
- Routine
- Revise
- Repeat
- Ready

Recall and Routine

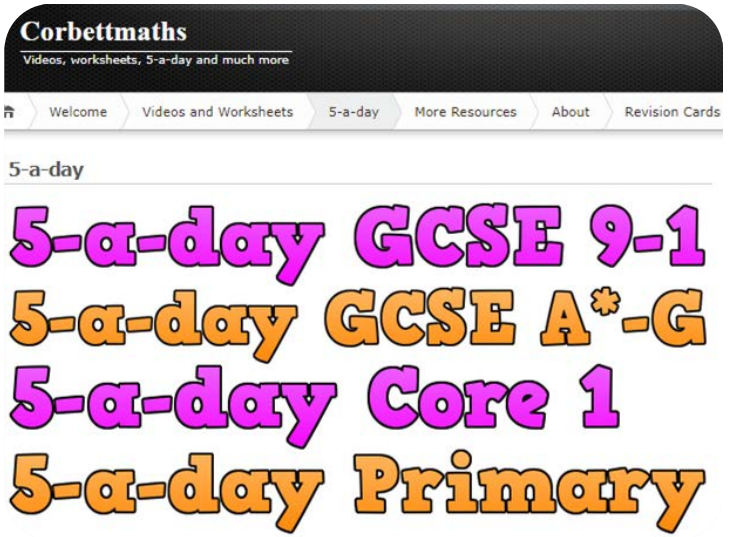
Recall:

- a fast ‘n’ furious starter
- name the first 20 prime numbers
- draw the parts of a circle
- sketch and name all the quadrilaterals
- based on Mathematical Association’s *48 Killer Facts for a C Grade*.



Routine

- practise, practise, practise
- Corbett Maths 5-a-day
- JustMaths Bread and Butter
- 30-second challenges
- m4ths.com challenges.



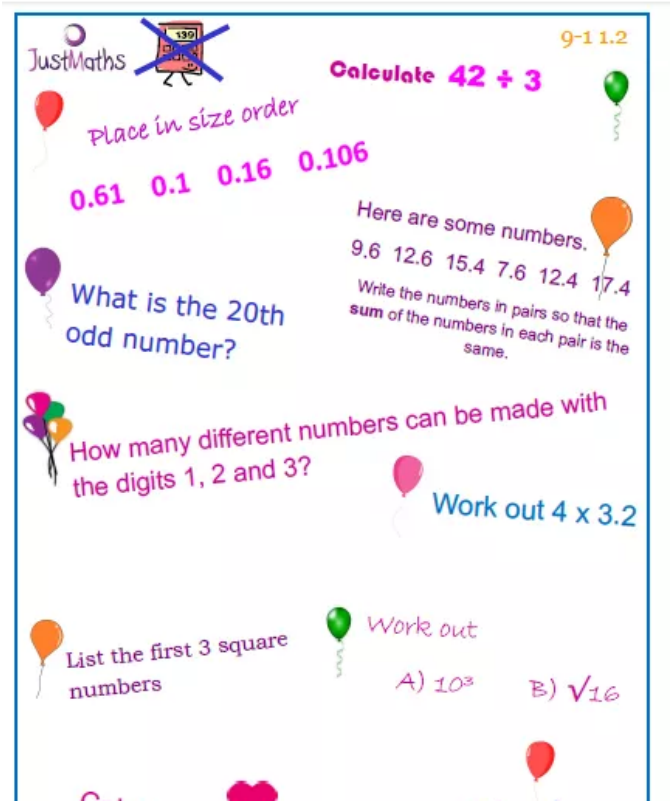
Revise and Repeat

Revise

- Key grade borderline topics – common questions
- Hegarty Maths and Corbett Maths videos
- Just Maths Top 40
- m4ths.com Help Sheet
- Resourceaholic.

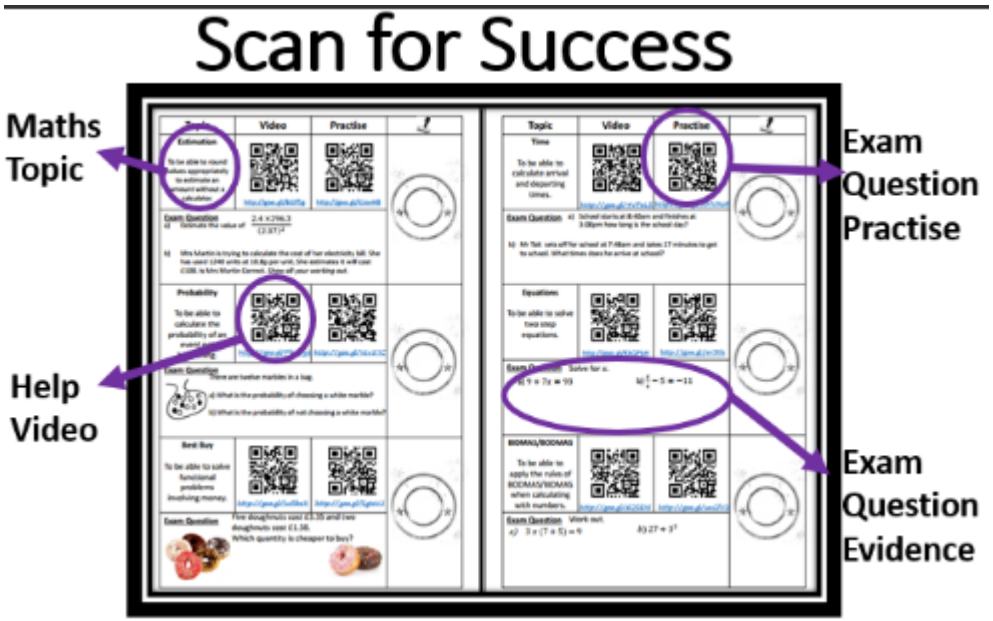
Repeat

- prethomework.weebly.com
- Corbett Maths practice questions
- Topic questions
- Studymaths.co.uk.



Ready?

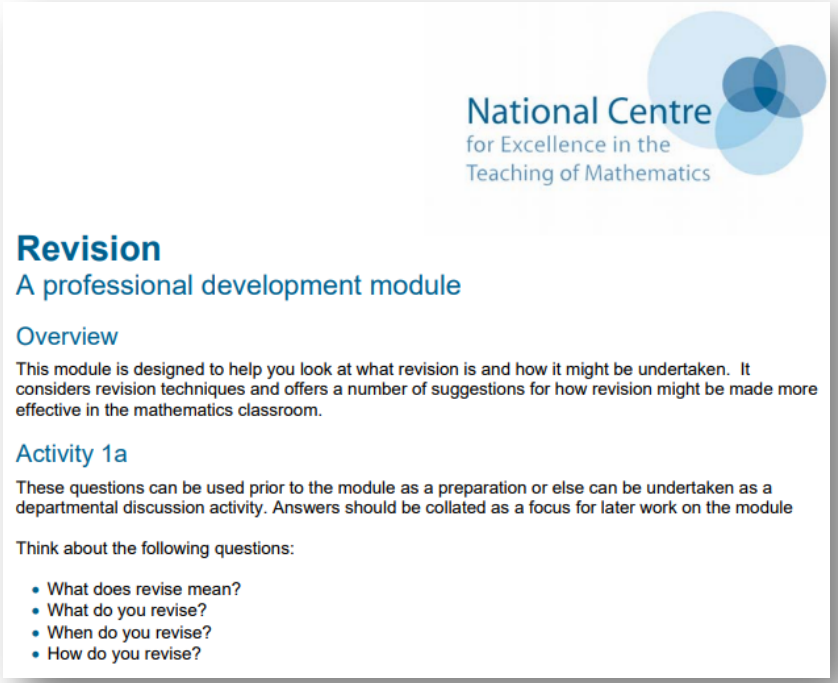
- Complete a maths passport (shown from Miss B's resources)
- Complete Symballoo
- Mathematical Association postcards
- Past papers
- Milestones



AQA route map for a 1-year GCSE Maths resit

Top tips, key resources and revision

- NCETM PD Module.
- Do not presume students know how to revise.
- Never assume they know the simple stuff.
- Teach them.
- How do you revise?
- What do you revise?
- Where do you revise?
- Why and who do you revise with?
- When do you revise?



National Centre
for Excellence in the
Teaching of Mathematics

Revision

A professional development module

Overview

This module is designed to help you look at what revision is and how it might be undertaken. It considers revision techniques and offers a number of suggestions for how revision might be made more effective in the mathematics classroom.

Activity 1a

These questions can be used prior to the module as a preparation or else can be undertaken as a departmental discussion activity. Answers should be collated as a focus for later work on the module

Think about the following questions:

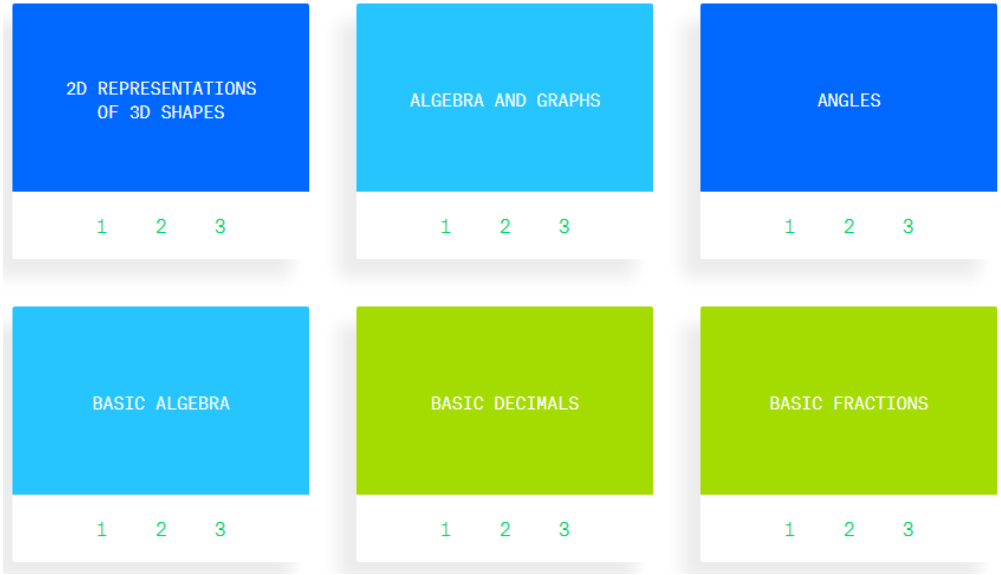
- What does revise mean?
- What do you revise?
- When do you revise?
- How do you revise?

Top tips

- Fake results.
- Double mark − once with grade gained, once giving back the marks lost through stupid errors.
- Concentrate on the language.
- Problem solving framework.
- Homework.
- Mathematical Association postcards.
- QR reader for starters.
- Twitter, Moodle and Edmodo, Padlet.
- Whole organisational approach.
- Everyone a Maths teacher.

Practice papers, sample assessment material, topic tests and milestones

- Used to past papers.
- All about that grade 4/5.
- Diagnostic questions AQA collections (shown)
- Six milestones.
- Clever marking.
- Common questions.



Support and resources for GCSE Mathematics

GCSE Maths resources

- All About Maths (allaboutmaths.aqa.org.uk)
- Teaching guidance (version 2 now available to include more examples and to clarify points raised by teachers from version 1)
- E-library
- Route maps
- Lesson plans – worksheets, activity plans and homework sheets
- Topic tests
- Practice papers (four sets, plus the specimen papers)
- Textbooks
- Enhanced Results Analysis (ERA)

All About Maths

Our free dedicated website for Maths resources:

- dedicated section to the new GCSE
- all the new GCSE resources are behind a log in
- current members need to update their details to get the new GCSE resources
- new GCSE resources are in a separate area to current resources.

Teaching guidance

What is it?

A comprehensive breakdown of the subject content.

What does it do?

- explains what 'students should be able to do' against each spec reference
- illustrates the types of questions that would be asked on a question paper against each spec reference.

A6 Know the difference between an equation and an identity; argue mathematically to show algebraic expressions are equivalent, and use algebra to support and construct arguments

Teaching Guidance

Students should be able to:

- recognise that, for example, $5x + 5 = 16$ is an equation, but $5x + 5 \equiv 5(x + 1)$ is an identity
- show that two expressions are equivalent
- use identities including equating coefficients
- use algebraic expressions to support an argument or verify a statement.

Notes

Arguments may use knowledge of odd and even, for example odd × even = even

Students should understand that, for example, if n is an integer then $2n$ is even and $2n + 1$ is odd.

Examples

1 Work out the values of a and b in the identity $2(ax - 5) + 3(5x + b) \equiv 21x + 2$

2 Show that $3(a - 4) + 2(2a + 5) + 9$ and $7(a + 1)$ are equivalent.

3 w is an even number.

Explain why $(w - 1)(w + 1)$ will always be odd.

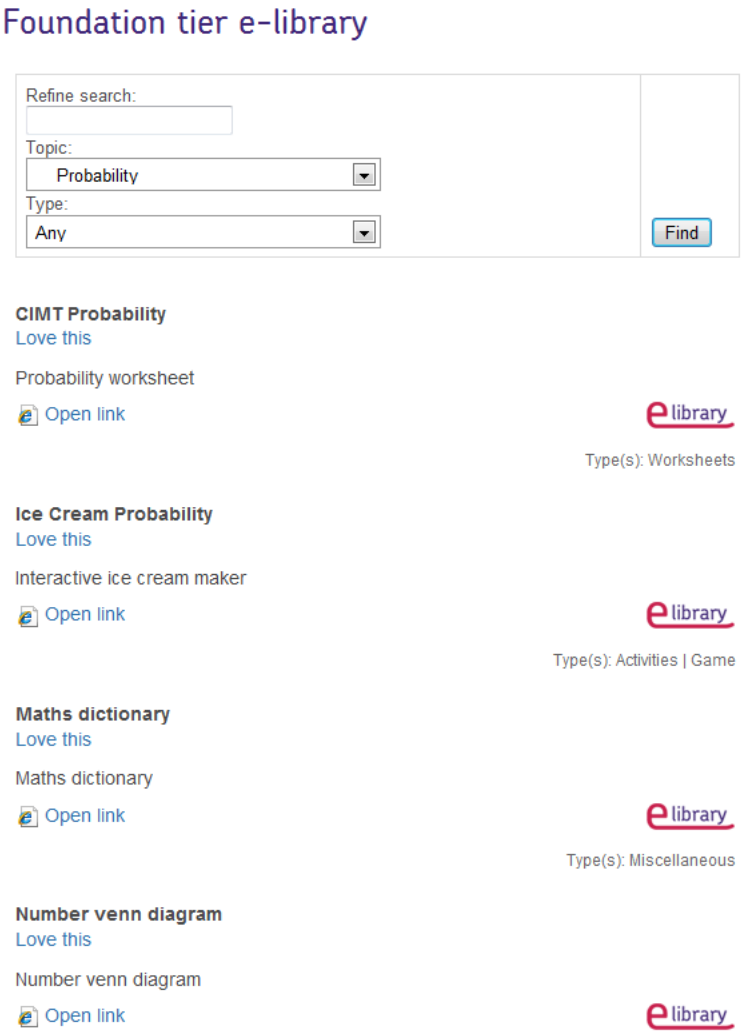
4 Sam says that when $m > 1$, $m^3 + 2$ is never a multiple of 3

Give an example to show that she is wrong.

E-library

Looking for something different?

- hosted on All About Maths
- ever-growing list of free resources from across the web
- search by topic/tier/resource type
- web resources recommended to us by teachers.



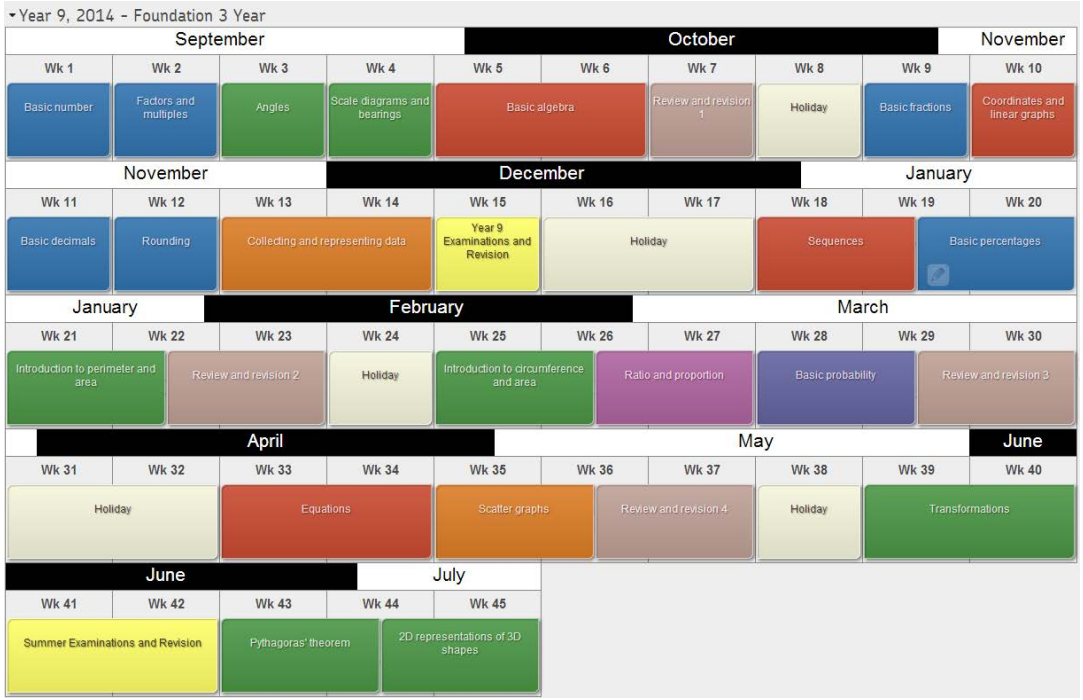
Route maps

AQA route maps are flexible planning tools designed to help you:

- organise teaching of the whole specification around your timetable
- find the resources you need to help teach each topic.

The route maps:

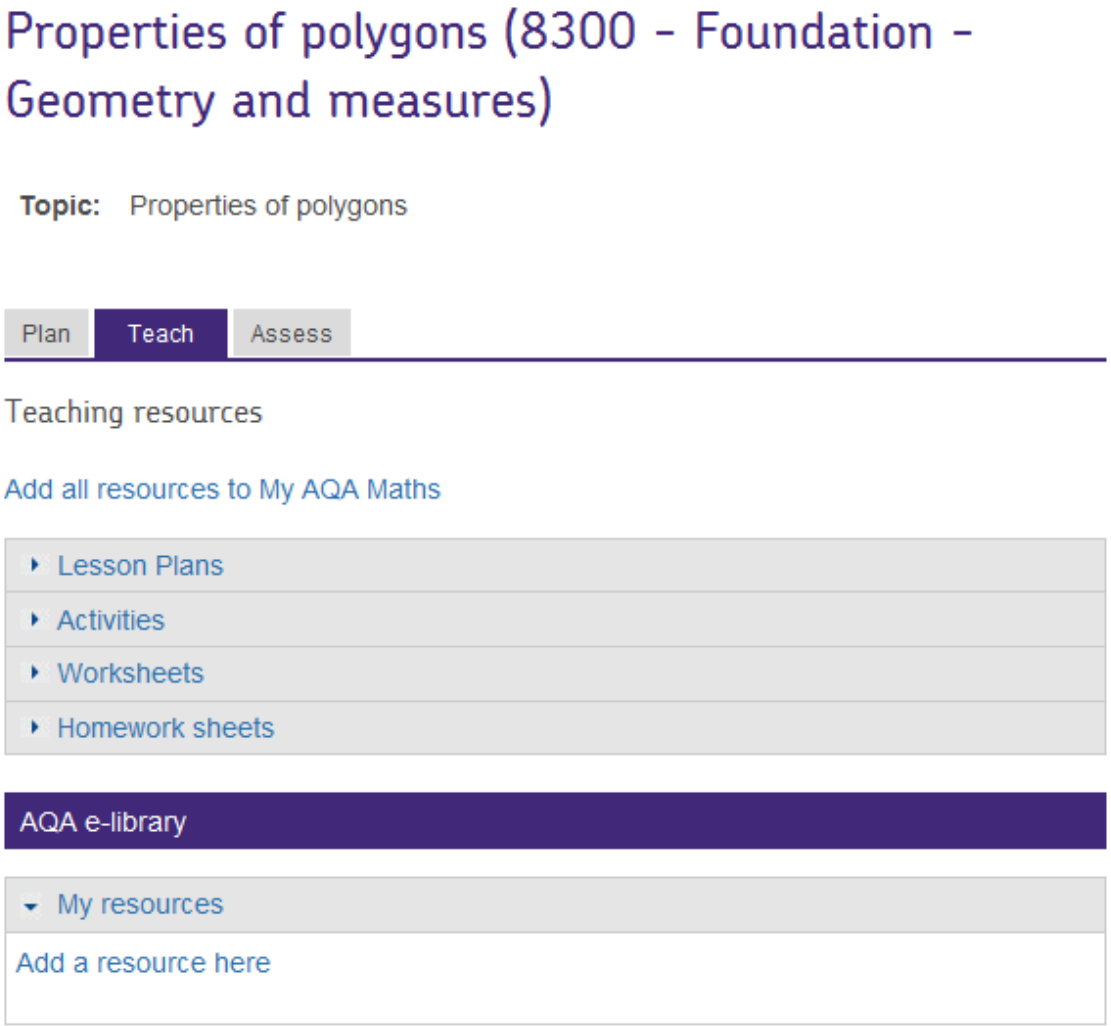
- are fully customisable
- break topics down to sub-topics
- are available now for one-, two- and three-year teaching.



Lesson plans and further resources

Under the Plan, Teach and Assess tabs find further support resources for every topic:

- lesson plans
- activities
- worksheets
- homework
- topic tests.



Specific resources for 1-year teaching

Available now:

- 1-year route map
- accompanying teaching guidance.

In production, working with experienced teachers from FE, ideas include:

- diagnostic test to use as students start the resit course.

Other resources

- Teach it
- ExamPro
- Alfiecloud
- Approved textbooks and electronic resources from:
  - Collins
  - Cambridge University Press (CUP)
  - Oxford University Press (OUP)

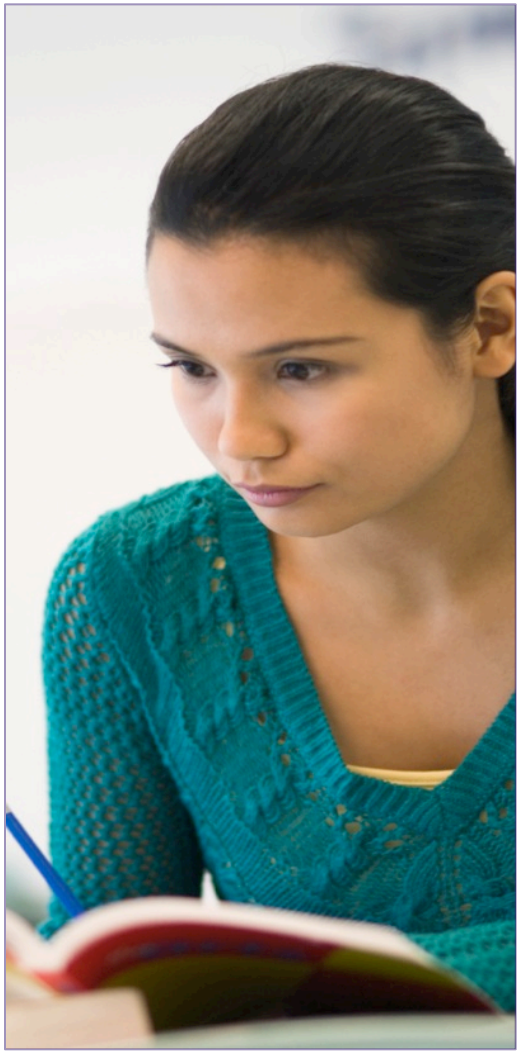


Image copyright: Thinkstock #106518823

AQA approved textbooks

The following textbooks from the following publishers are approved by AQA:

Collins

- *AQA GCSE Maths: Foundation Student book*
- *AQA GCSE Maths: Higher Student Book*

Oxford University Press (OUP)

- *AQA GCSE Maths Foundation*
- *AQA GCSE Maths Higher*

Cambridge University Press (CUP)

- *GCSE Mathematics for AQA Student Book: Foundation*
- *GCSE Mathematics for AQA Student Book: Higher*

Contact points for further information and guidance

Maths curriculum team:

maths@aqa.org.uk

0161 957 3852

Professional development training/events:

events@aqa.org.uk

0161 696 5994

AQA website:

aqa.org.uk

Advocates:

- Remote and on-site support for teaching and learning.
- Contact the Maths curriculum team (above) for details of your local advocate.

Ready to work with us?

Thank you

We are an independent education charity and the largest provider of academic qualifications for all abilities taught in schools and colleges.

Our aim is to enable students to realise their potential and provide teachers with the support and resources they need so that they can focus on inspiring learning.

aqa.org.uk