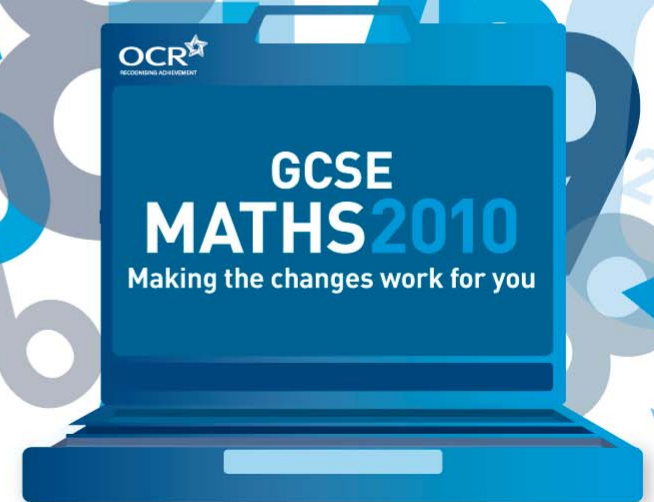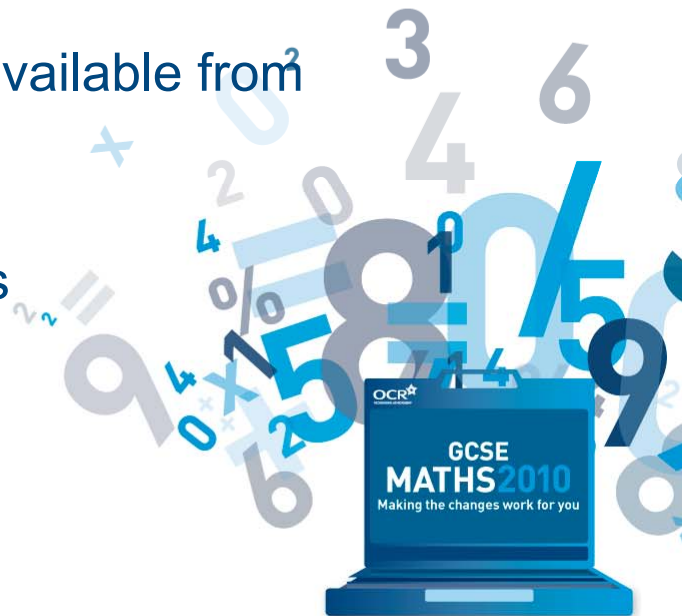# GCSE Maths

Introducing our new specifications

For first teaching from September 2010

Aims of the presentation

- To learn about the structure of OCR's new GCSE Maths A specification and how it will work for you and your learners.

- To learn about the structure of OCR's new GCSE Maths B specification and how it will work for you and your learners.

- To identify the new Assessment Objectives.

- To find out about the support and resources available from OCR and our publisher partners.

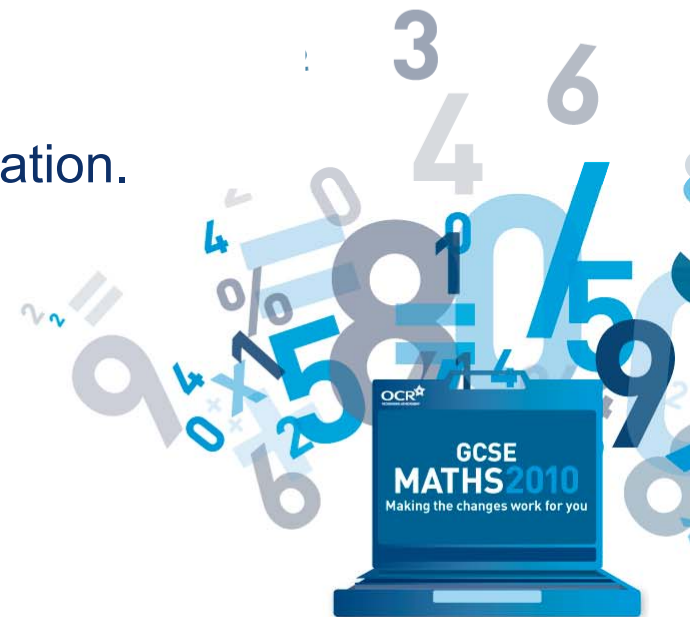- To summarise the benefits of choosing OCR's new GCSE Maths specifications.
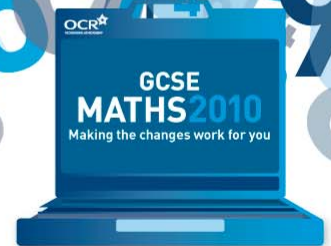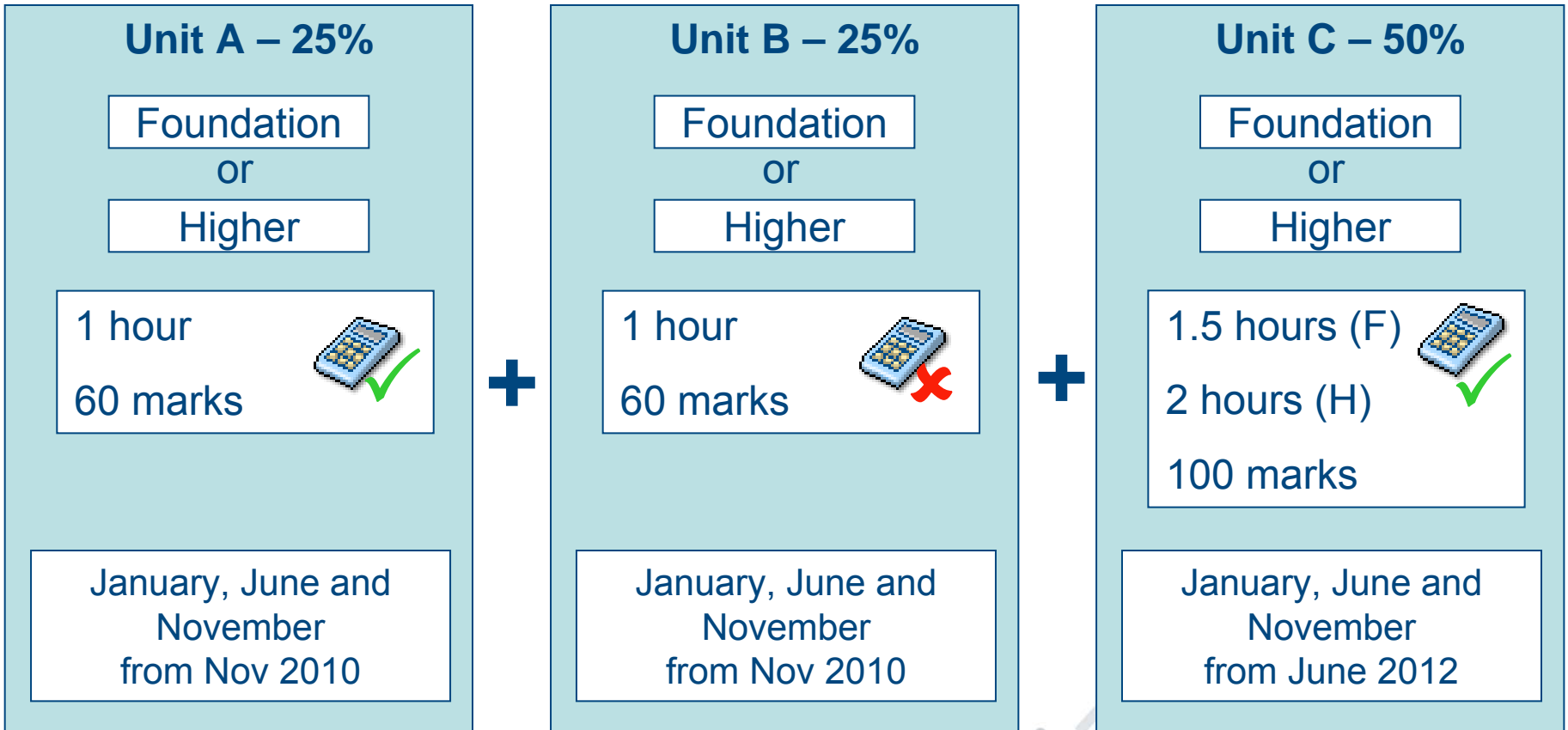
GCSE Mathematics A (J562)
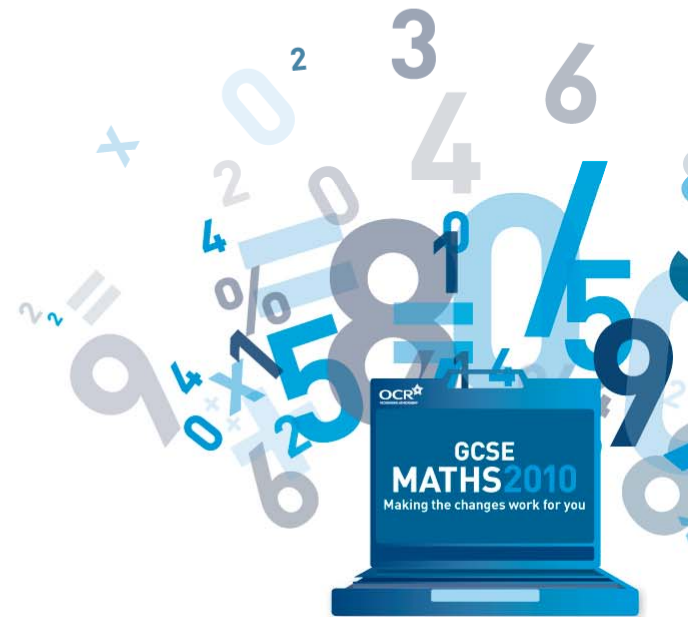
Benefits of GCSE Maths A (J562)

- Offers a straightforward yet flexible specification that can be used as a modular or a linear course – even with different classes within the same cohort – so you can teach the way you prefer:
  - Straightforward – three units and learners have to take them all
  - Flexible – choice of tier for <u>each</u> unit, and choice of entry series.

- Ability to mix tiers of units across the qualification.

- All content areas covered in each unit.

- Opportunity to re-sit units once prior to certification.

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GCSE Mathematics A

Unit A – 25%		Unit B – 25%		Unit C – 50%
Foundation or Higher		Foundation or Higher		Foundation or Higher
1 hour 60 marks	**+**	1 hour 60 marks	**+**	1.5 hours (F) 2 hours (H) 100 marks
January, June and November from Nov 2010		January, June and November from Nov 2010		January, June and November from June 2012

GCSE MATHS2010
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Content of the Units for GCSE Maths A

- There is specified content for each unit.

- Each unit covers elements of **all** the main topic areas – Number, Algebra, Geometry & Measures, and Statistics.

- Unit C contains the more difficult concepts at each tier and builds on the content covered in Units A and B.

- AO3 weightings are ramped across the three units:
  - Units A and B: AO1, AO2 & AO3 ≈ 30/20/10 marks.
  - Unit C: AO1, AO2 & AO3 ≈ 50/26/24 marks.
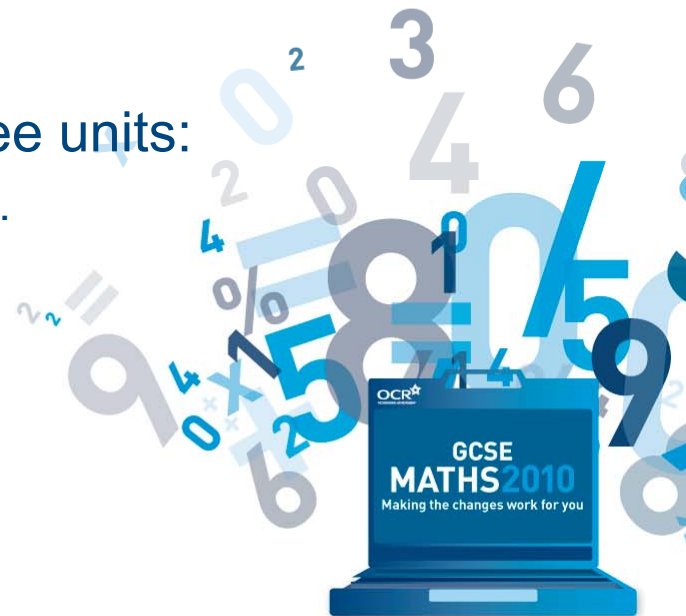
GCSE Maths A - the linear option

- Teach the specification content in the order you choose

- Enter each learner for all three units in the certification series - A501, A502, A503
  - Choose a tier option for each unit for each learner; these can be different, eg higher tier for A501 and foundation tier for the others

- Enter each learner for the GCSE certification code J562

- Units A501 and A502 will be timetabled back-to-back, in the same session, with A503 on a separate date, so the examination will be structured similarly to J512
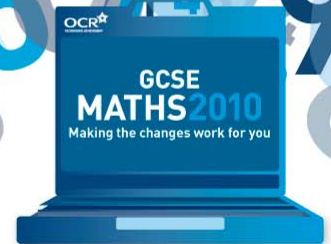
GCSE Maths A – modular options

- Alternatively, the units can be spread out over a period of time, and there is specified content for each – again, you can mix the tiers

- Learners are allowed one re-sit of each unit prior to certification

- There are a number of routes that can be taken in this specification eg

Unitised route	Staged route
Unit A501: Jan of Yr 10 Unit A502: June of Yr 10 Unit A503: June of Yr 11	Units A501 & A502: June of Yr 10 Unit A503: June of Yr 11

- Other routes are available

- This means this specification addresses the needs of different groups within a cohort
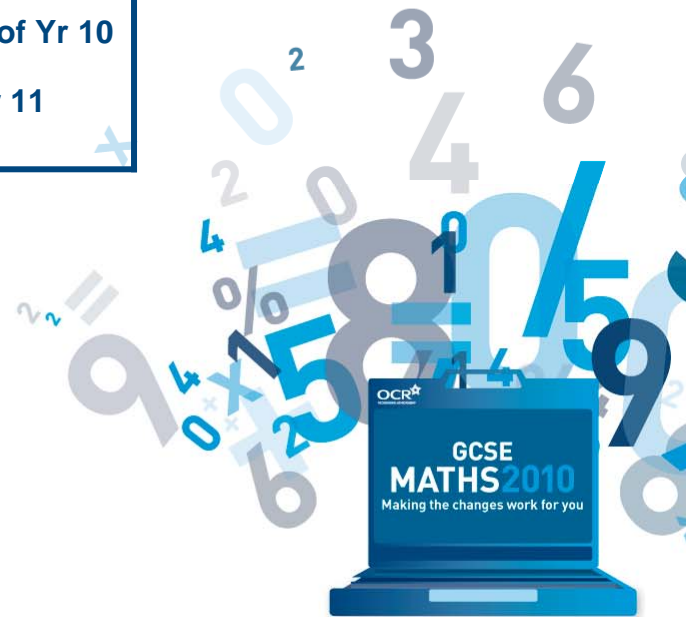
GCSE Maths A certification

- For certification, each learner only needs to be entered for J562 – they do not need to be entered for a **tier** of certification.

- To be entered for certification, a learner needs to be taking **at least** 40% of the assessment in the certification series.

- When re-sitting the GCSE, learners only need to re-enter some (40%+), not all, of the units.

- Certification will first be available in June 2012 and then in January, June and November in subsequent years.
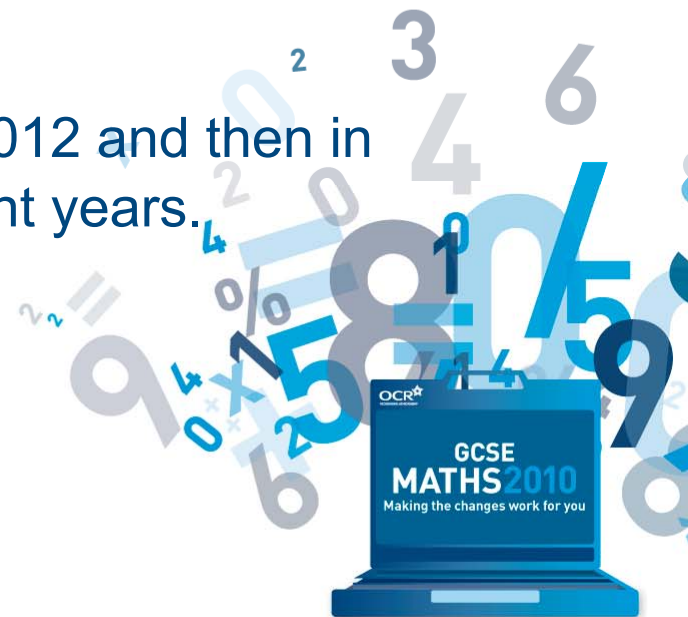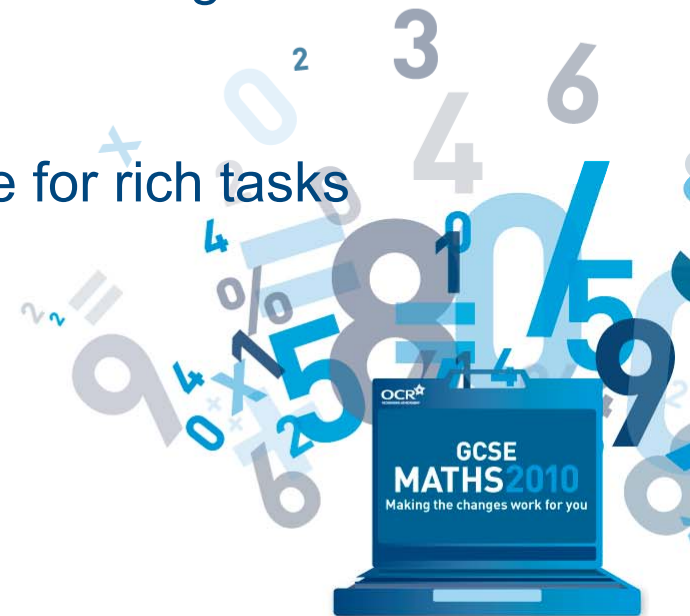
GCSE Mathematics B (J567)
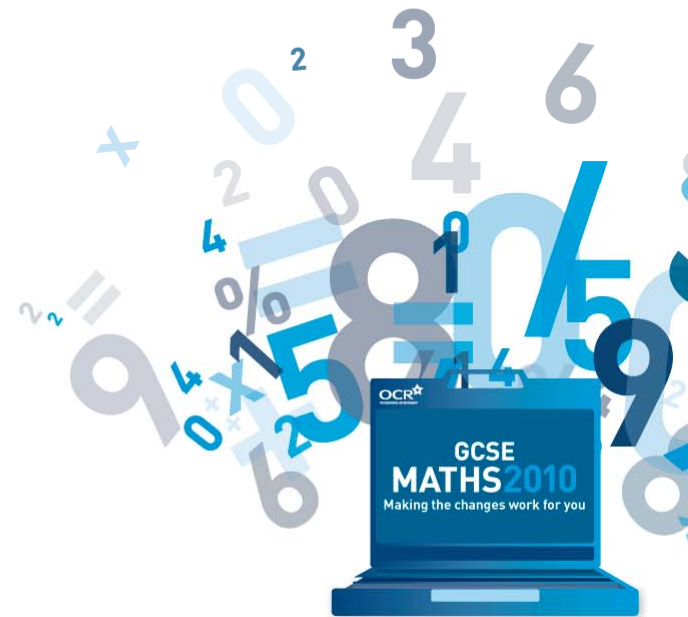
Benefits of GCSE Mathematics B (J567)

- Maths B is linear: both papers are taken at the end of the course:
  - Free to teach the course in the order you want
  - Learners can make connections in mathematics throughout the course.

- Low assessment burden.

- Learners have the chance to develop problem solving skills before they do the assessments.

- No revision for unit assessments, saving time for rich tasks to develop learners' understanding.

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GCSE Mathematics B

Foundation

Paper 1	Paper 2
1 hr 30 min ✗	1 hr 30 min ✓
100 marks	100 marks

March, June and November from June 2012

OR

Higher

Paper 3	Paper 4
1 hr 45 min ✗	1 hr 45 min ✓
100 marks	100 marks

March, June and November from June 2012

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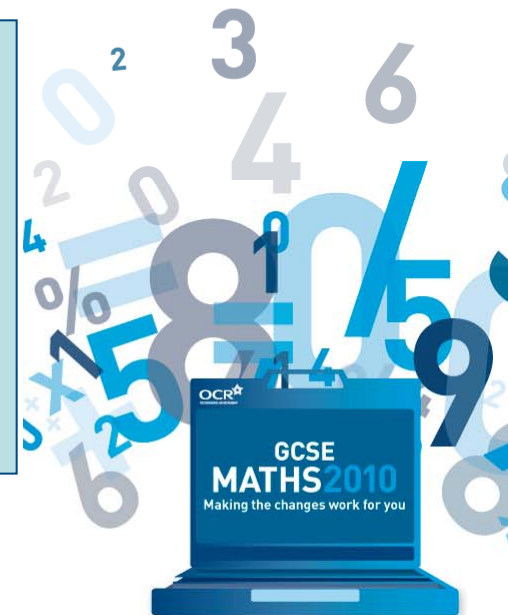
Teaching stages in Mathematics B

Foundation

| Initial Stage	Bronze Stage	Silver Stage	Gold Stage		
		Initial Stage	Bronze Stage	Silver Stage	Gold Stage

Higher
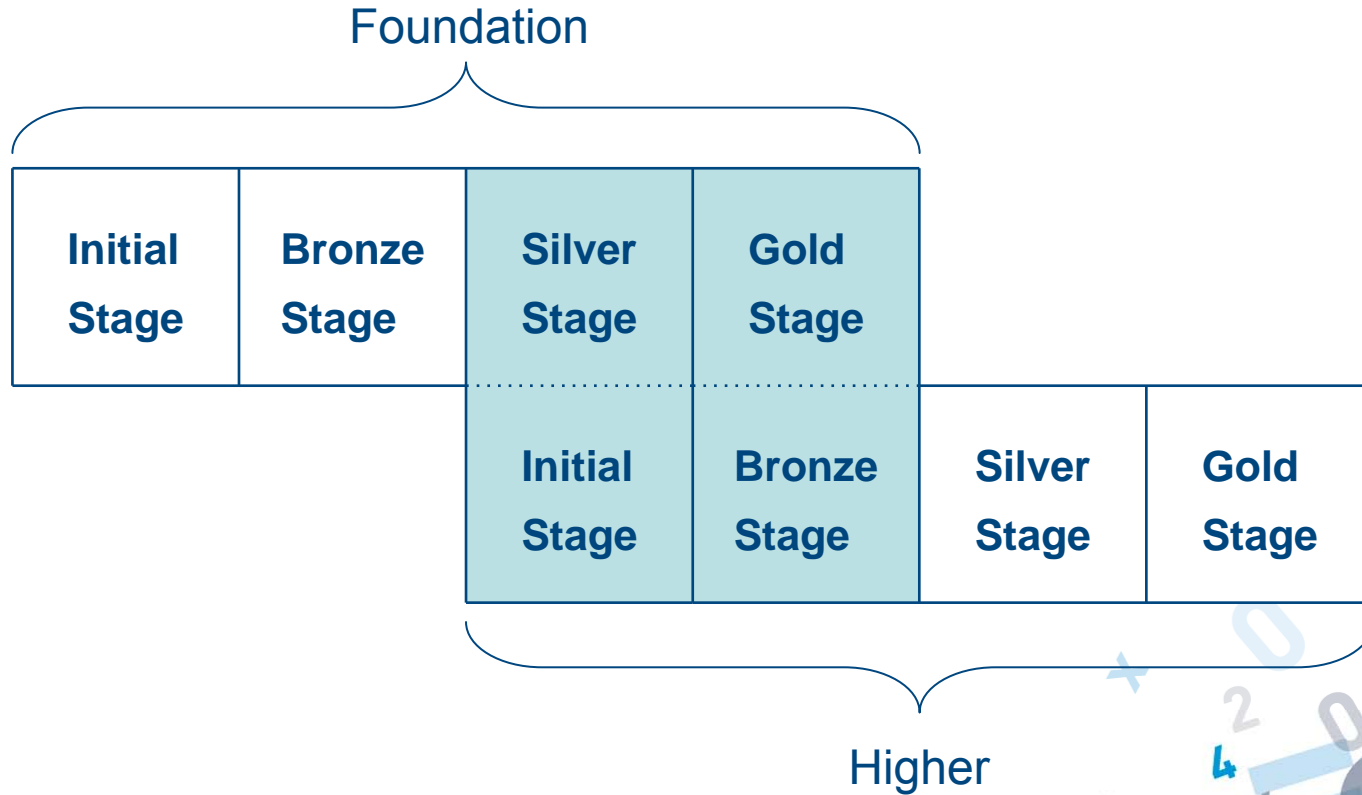
Teaching GCSE Mathematics B

- As a linear GCSE, Maths B offers the chance to plan your own programme of study, content is laid out in four stages for each tier and also in the conventional way in an appendix.

- GCSE, Maths B also offers a chance to target the level of teaching of the level of ability of the students because of the way the content is set out.

- Target teaching appropriately to the needs of different students or groups.

- Formative assessments available from OCR for each stage:
  - Identify strengths, areas for improvement, and students' levels.
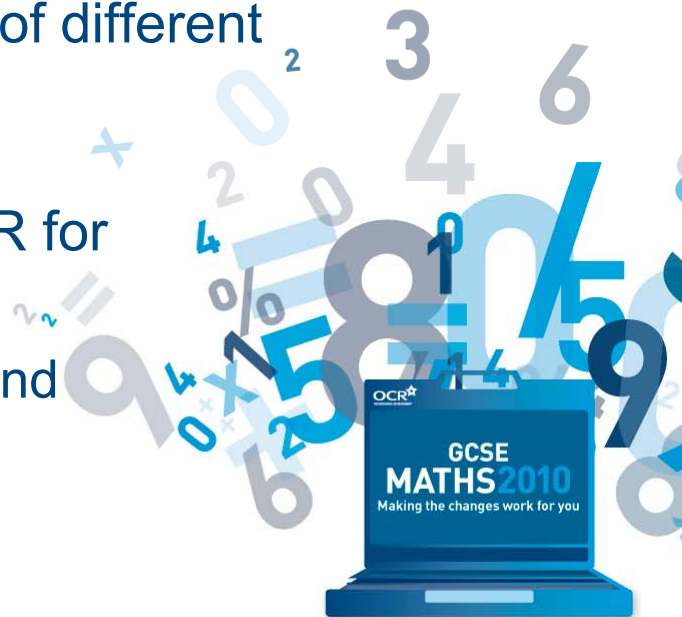
New Assessment Objectives

- **AO1 Recall and use their knowledge of the prescribed content (45 to 55% weighting).**
  - Example can be seen here.

- **AO2 Select and apply mathematical methods in a range of contexts (25 to 35% weighting).**
  - Examples can be seen here.

- **AO3 Interpret and analyse problems and generate strategies to solve them (15 to 25% weighting).**
  - Examples can be seen here.
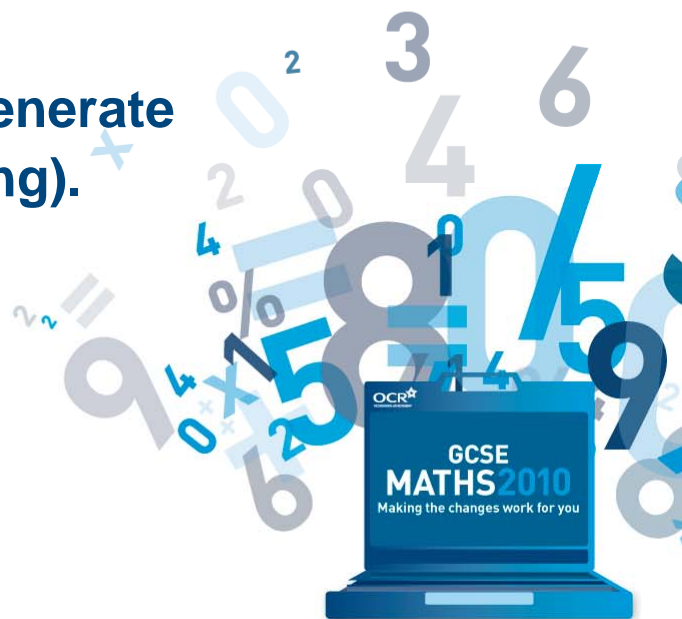
Functional Elements of Maths

Functionality has been embedded into all new Maths GCSEs, to allow learners to show that they can use Maths effectively in everyday life.

Learners must demonstrate that they have the ability to:
• Understand and make sense of mathematical information
• Use and process that information, applying mathematical skills
• Interpret and analyse the results
• Present this to others.

Functional elements are weighted at 30 to 40% on foundation Tier and 20 to 30% on higher tier.
•An example can be seen **here**.
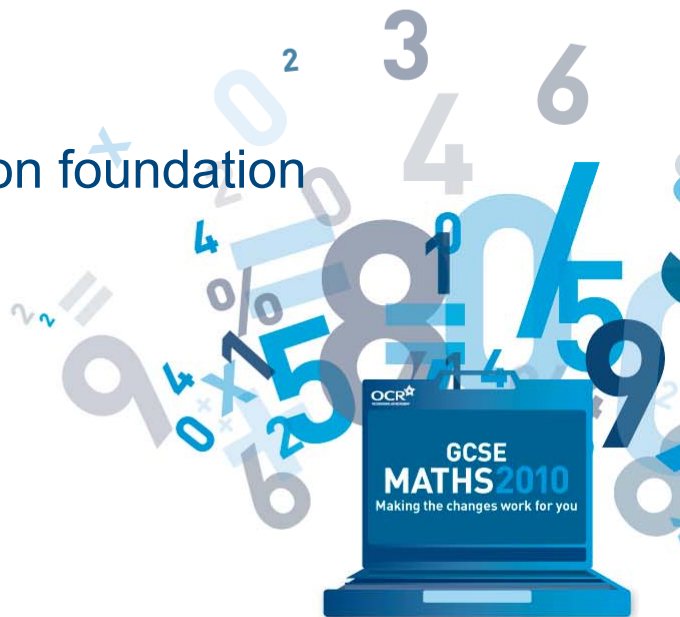
Quality of Written Communication (QWC)

- This is a requirement for all maths GCSEs from September 2010.
- A small number of questions will assess QWC, not all questions.
- Questions that assess QWC will be flagged with an asterisk (*).

In questions assessing QWC learners will be expected to:

- Present their answer in an appropriate form – which may involve the correct use of formulae, equations, expressions, or labelled diagrams

- Organise their answer clearly and coherently

- Use correct spelling, punctuation, grammar where writing is required.

- An example can be seen here.

- The QWC mark scheme can be seen by clicking here.
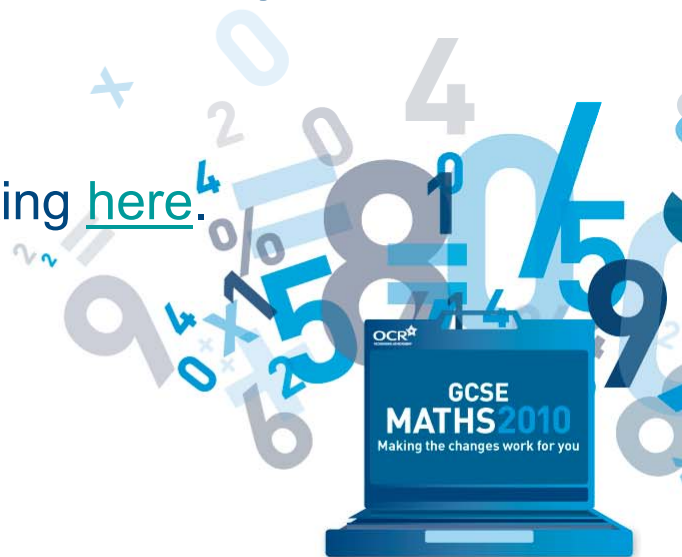
Support for OCR GCSE Maths

- The clearest maths question papers
  - Written in accessible language
  - Typeset in easy-to-read Arial font, without the serifs that come with Times NR
  - Spread out well without borders or boxes – so your learners can answer the questions as they like, without worrying about margins

- Specifications, specimen assessment materials with mark schemes, and assessment grids identifying the AO1, AO2, AO3, functional and QWC questions are online now
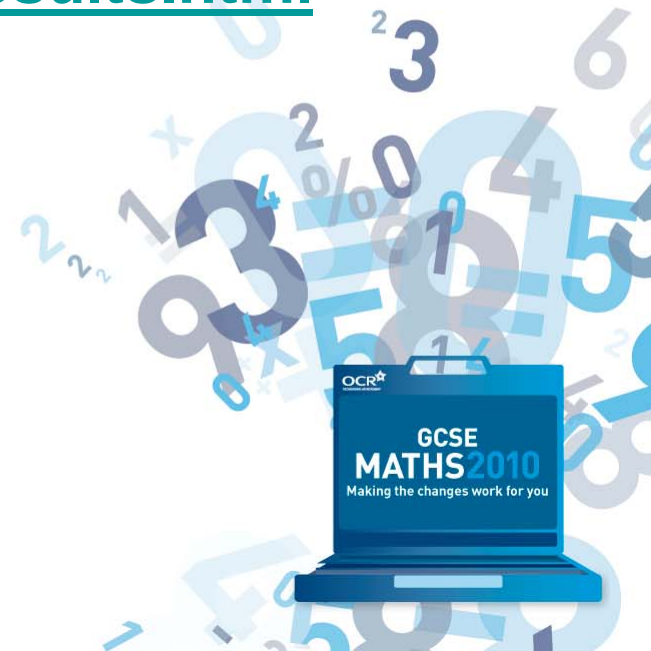
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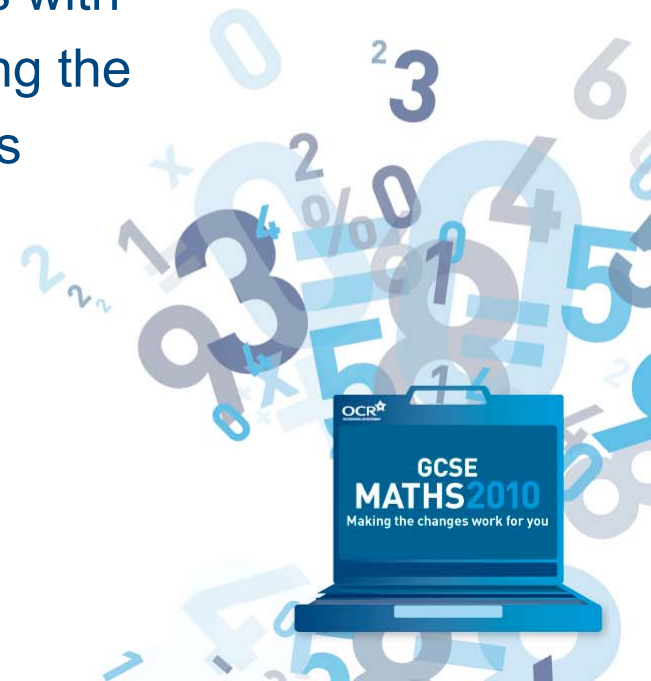
Support for OCR GCSE Maths

- **activeresults** analyse your learners' results in greater detail with our new, free online results analysis software.
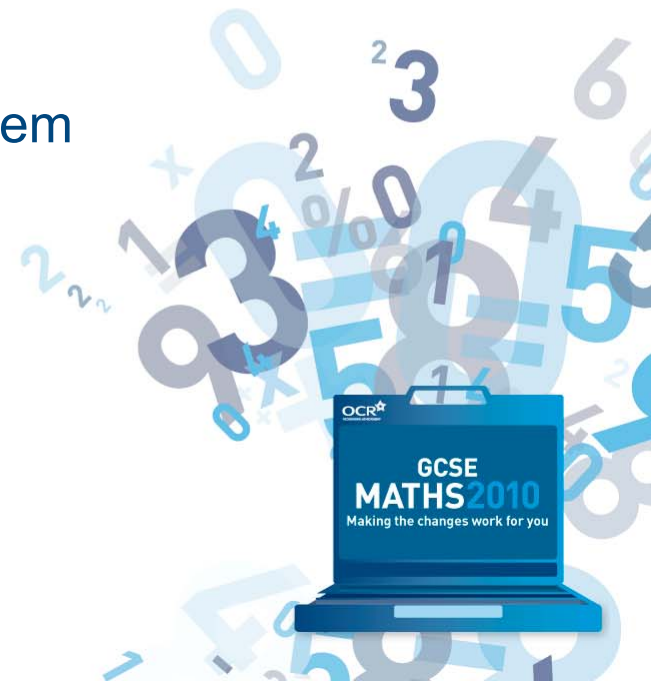
  For more information, go to:
  www.ocr.org.uk/interchange/active_results.html

Support for OCR GCSE Maths

- FREE Inset 'Get Started' training

- Additional mock papers available in 2010 – from OCR Interchange.

- Schemes of work and sample lesson plans.

- OCR's Guide to Problem Solving, with worked examples.

- The School Mathematics Project bite-size problem solving resources.

- Parents' and learners' guide to the new GCSE.

Support for OCR GCSE Maths
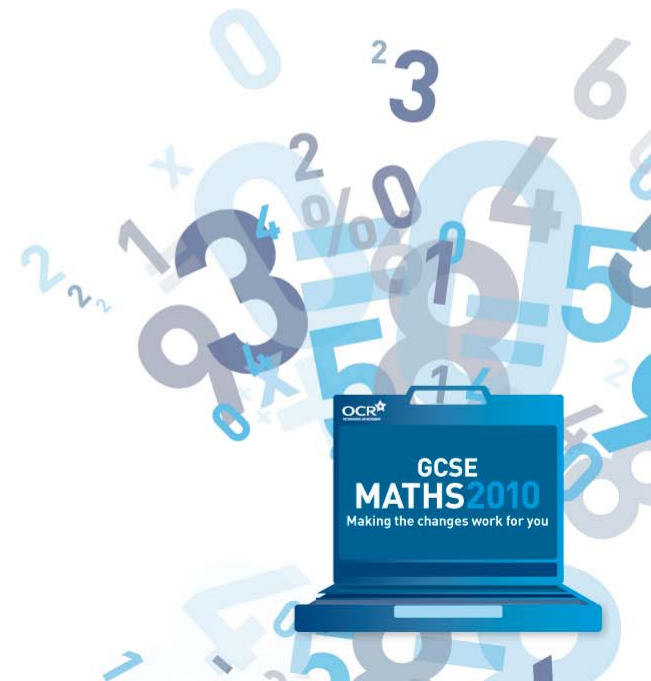
Publisher Partner Resources

GCSE Maths A

http://ukcatalogue.oup.com/product/education/secondary/maths/9780199139279001000.do

GCSE Maths B

http://www.hoddereducation.co.uk/Schools/Mathematics/OCR-GCSE-Mathematics-B.aspx

Support for OCR GCSE Maths

- E-alert updates – register at **www.ocr.org.uk/2010signup**.

- E-Community **www.ocr.org.uk/community/2010maths**.

- Dedicated Maths e-mail at **maths@ocr.org.uk**.

- Dedicated Maths telephone helpline - **0300 456 3142**:
  - to help you with your Maths related enquiries.
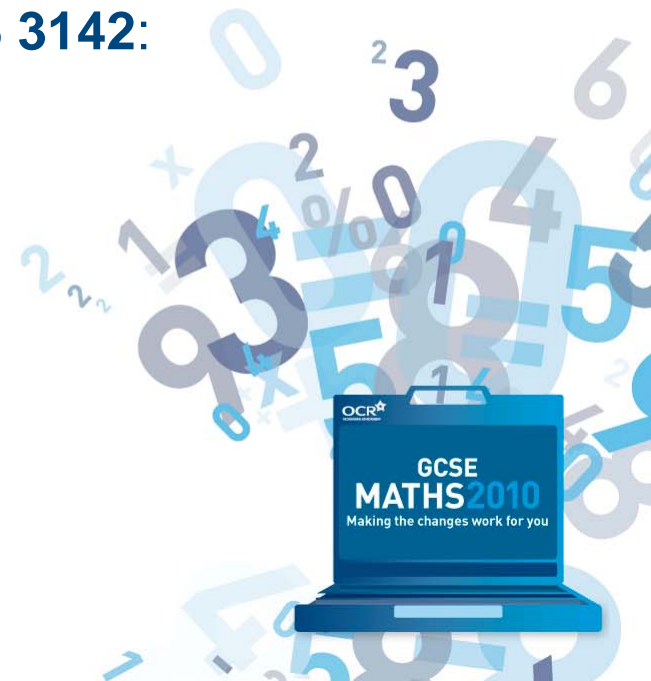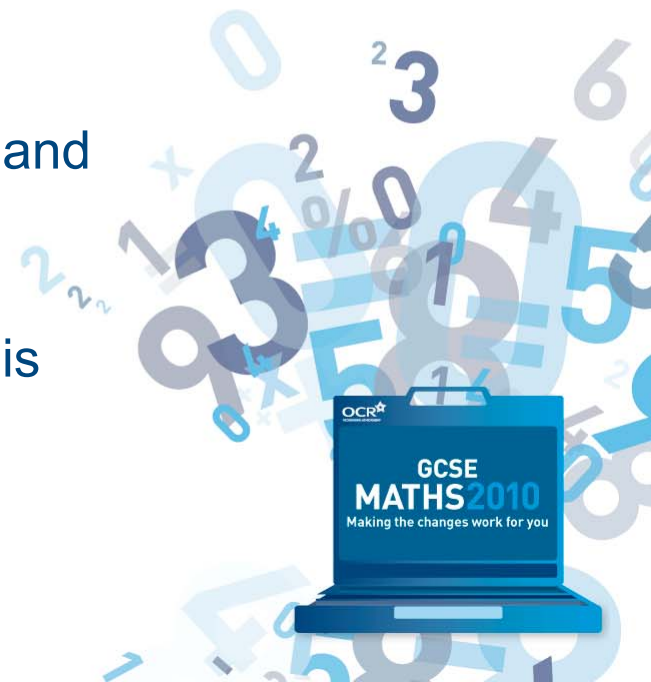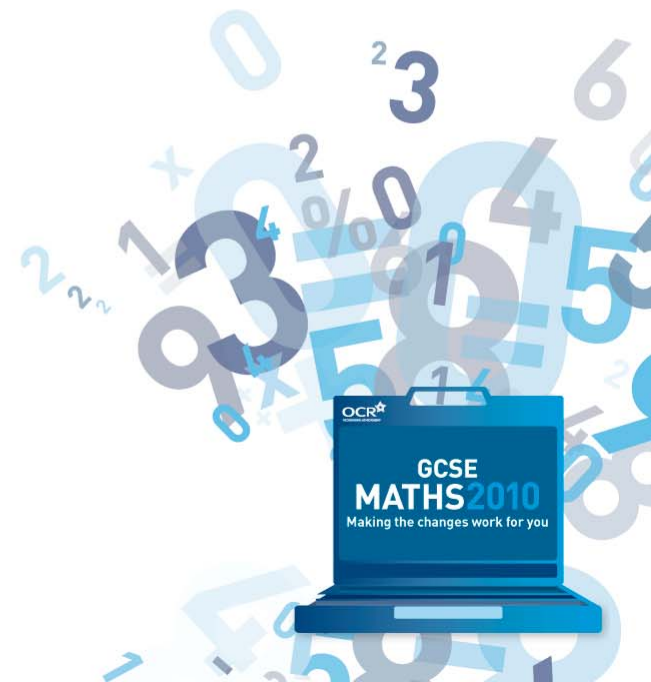
examQuest

ExamQuest contains a searchable bank of OCR examination questions that enables you to:

- Create and print your own tests or homework in minutes
- Produce targeted revision materials
- Search and select questions by topic, unit, specification, type or level
- Create and print out examiners' reports and the mark schemes for your selection
- Export questions to Microsoft Word
- Create spreadsheets for your selection to enter and analyse pupils' marks.

ExamQuest is produced by Doublestruck Ltd and is available from **http://www.examquest.co.uk** .

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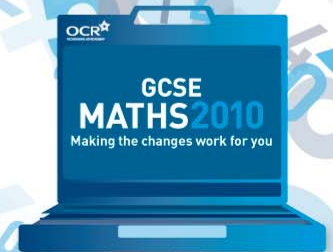
Thank you for watching the presentation

AO1 Examples

- Work out $4 + 6 \times 3^2$.

- Work out the mean of these weights.

- Solve algebraically these simultaneous equations.

- A is the point (0, 3) and B is the point (8, 9). Calculate the length AB.

- Work out. **(i)** 63×100 **(ii)** 137×10

- Show that $\dfrac{(3 + \sqrt{3}\,)^2}{\sqrt{3}} \equiv 6 + 4\sqrt{3}$

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AO2 Examples (1)

- This formula is used to change miles into kilometres.

miles → divide by 5 → multiply by 8 → kilometres

Janet drives 75 miles from Southampton to London.

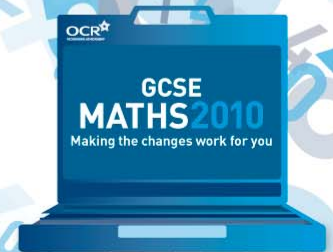Use the formula to work out how many kilometres she drives.

- Donna is doing a survey about the local library.
  Here is one of her questions.

  How many books do you borrow from the library in a year?

  Do you think this is a good question?   Explain your answer.

- Donna stands inside the library on a Thursday afternoon to do her
  survey.   Explain why this is not a good idea.

Next Example

AO2 Examples (2)

A rat runs through a maze.
The maze consists of 12 congruent parallelograms.
In the diagram the lines show the paths in the maze that the rat can run along.

$$\overrightarrow{OA} = \mathbf{a}. \quad \overrightarrow{OB} = \mathbf{b}.$$

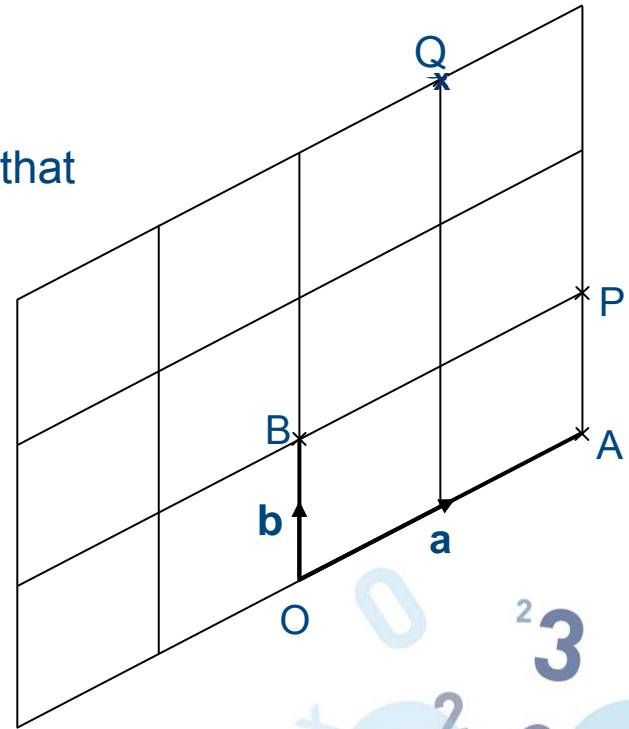The rat begins its run at the point O.

(a) Write down in terms of **a** and **b** a vector that represents the rat run from
 (i) O to P (1 mark)
 (ii) P to Q (2 marks)

(b) Another rat enters the maze at O and follows a path represented by the vector $2\mathbf{b} - \mathbf{a}$.

 Mark the end of this path on the diagram using the letter R. (1 mark)
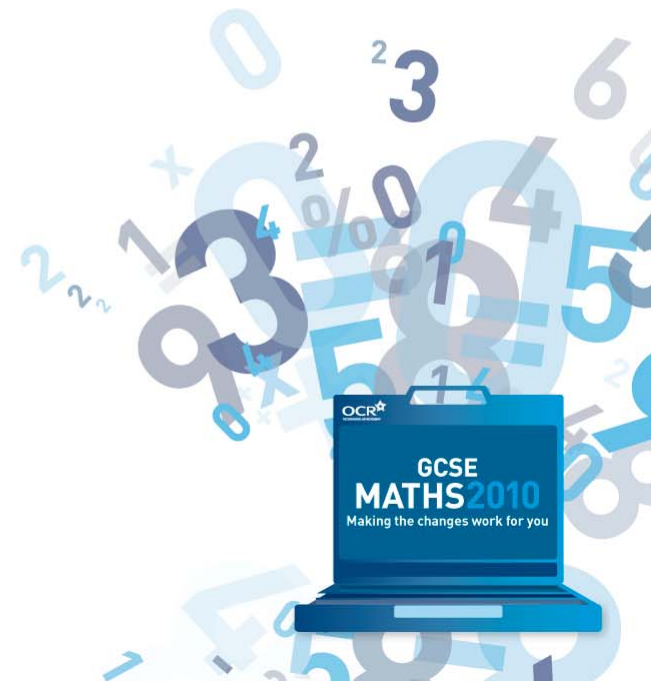
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AO3 Examples (1)

Dave the cat meows every 6 minutes.
Poppy the cat meows every 8 minutes.
At 8:45, they both meow together.

At what time will they next meow together?

(Foundation or Higher, non-calc, 4 marks)
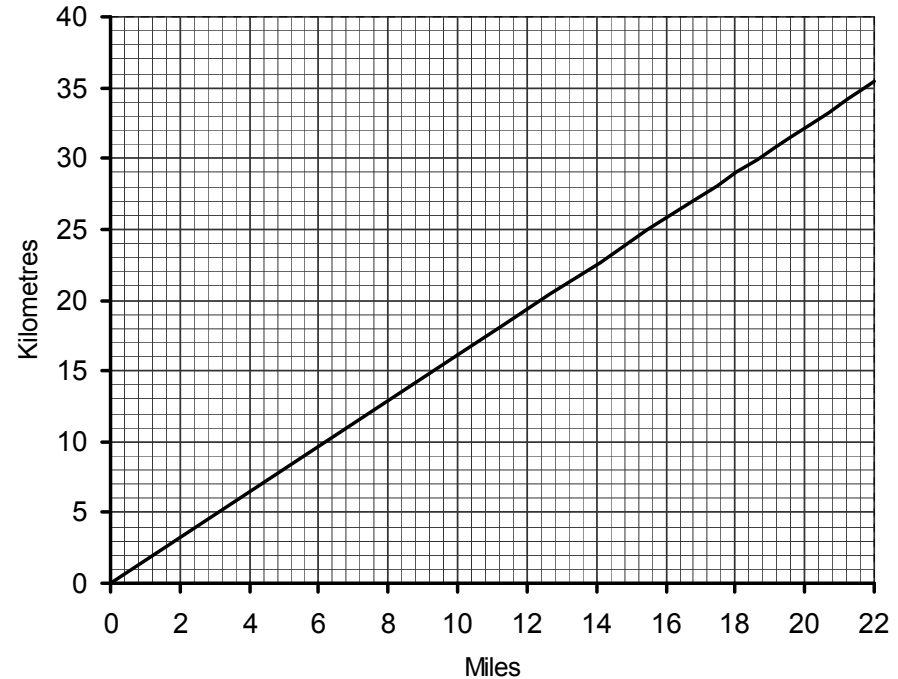
Next Example

AO3 Examples (2)

Ashia and Mel are in training for a marathon.
One week Ashia runs for a total of 39 miles.
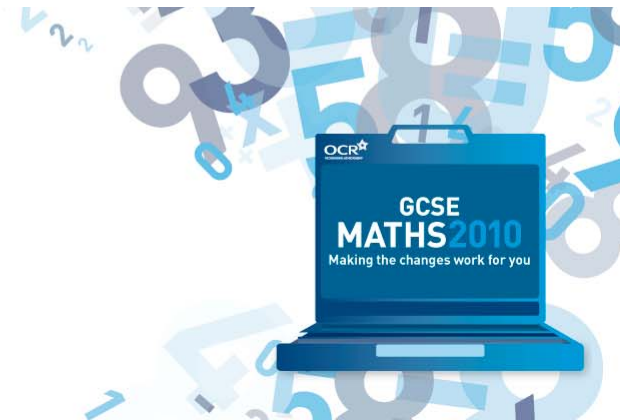Mel runs for a total of 68 kilometres.

Who has run further this week and by what distance?

Conversion graph between miles and kilometres

(Foundation, calculator, 4 marks)

<u>**Next Example**</u>

AO3 Examples (3)

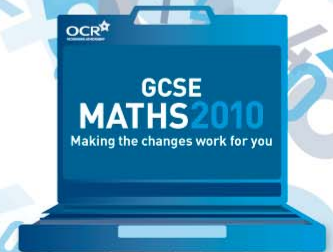In a certain country, 33% of the people have been vaccinated against measles.

A person who has been vaccinated has a 6% chance of catching measles.

A person who has not been vaccinated has a 41% chance of catching measles.

What is the probability that a person in this country, selected at random, will catch measles?

(Higher, calculator, 3 marks)

AO3 Examples (4)

Four teams competed in a competition to design a strong bridge that was as light as possible. The efficiency of each bridge was worked out using this formula.

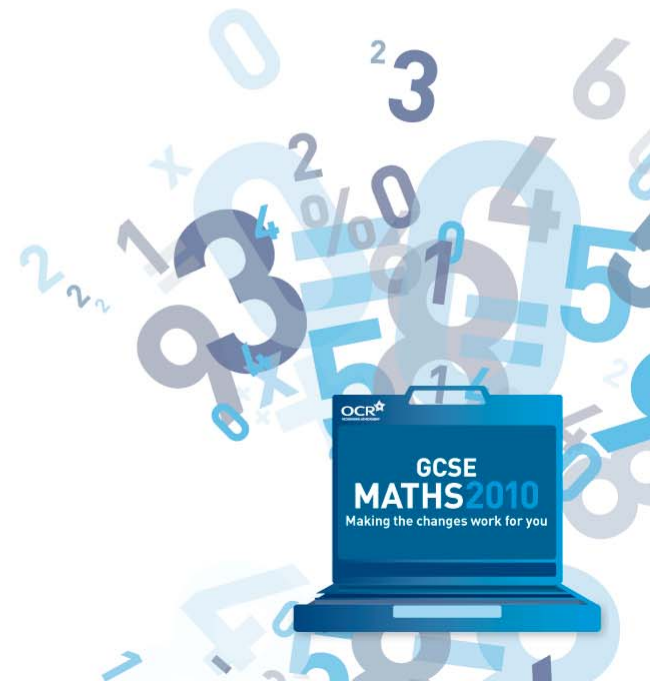Efficiency = maximum load the bridge could support ÷ weight of the bridge

The table shows the results.

Team	Maximum load (kg)	Weight (kg)	Efficiency
A	14·5	0·70	
B	11·6	0·48	
C	16·7	1·12	
D	16·4	0·89	

Use estimation to put the teams in order of efficiency.

(Higher, non-calc, 5 marks)

Back to Presentation
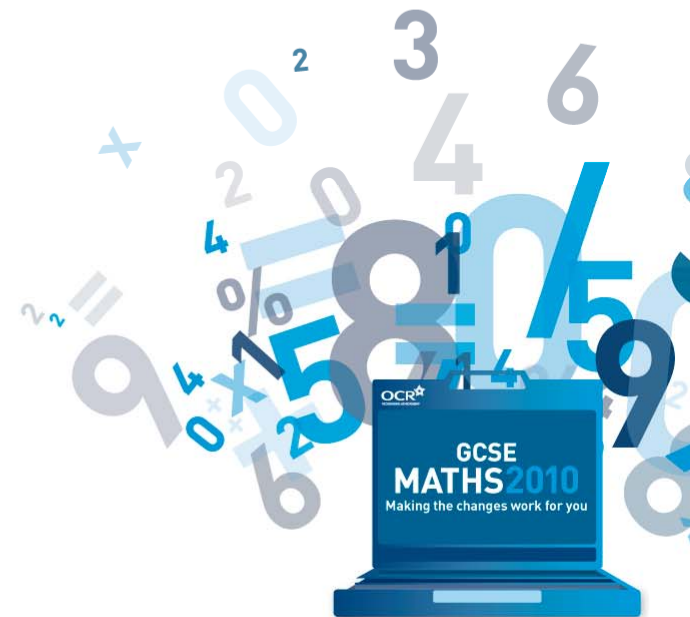
Functional Elements & AO2 Example

Pam gives her cat $\frac{2}{3}$ of a tin of cat food at each meal.

The cat has 2 meals each day.

How many tins of cat food will Pam need to buy to feed her cat for 7 days?

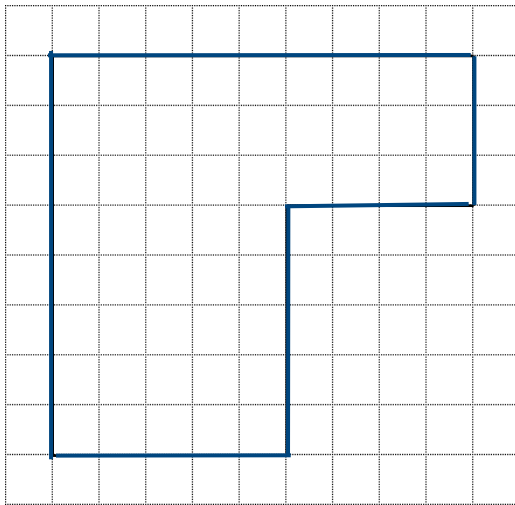[Common question worth 3 marks]

Back to Presentation

AO3 and Functional Example (Inc QWC)

Adnan is insulating his loft.

One roll of insulation will cover an area of 1·97 m².
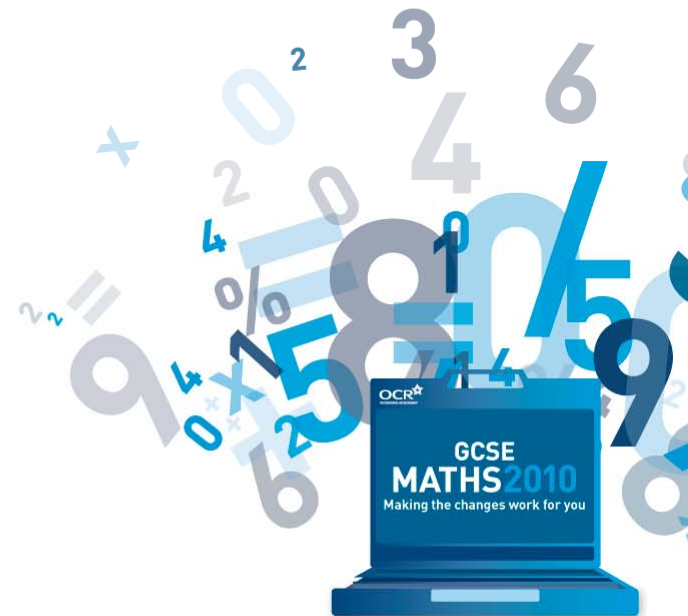
Here is the plan view of Adnan's loft.

Scale: 1cm represents 2 m

[nb diagram drawn on ½ cm squares]

How many rolls of insulation does Adnan need to buy to insulate his loft?

(Higher, calculator, 6 marks)

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QWC: example mark scheme

27 rolls with correct and clearly expressed supporting method showing area of loft/ length of insulation required and rounding to correct integer number of rolls.	**6-5**	For lower mark **-** incorrect integer number of rolls with correct and clearly expressed supporting method showing area of loft/length of insulation required and converting to rolls **or** correct number of rolls but method not clearly presented.
Area of loft found (52 m^2) or total length of strips of insulation found within a clearly presented method.	**4-3**	For lower mark – an incorrect area or number of strips is indicated within a clearly presented method or the correct area or number of strips is indicated but the method is not clearly presented.
Clearly identifying real dimensions from plan view or showing layout of strips of insulation on plan and some evidence of method used.	**2-1**	For lower mark – real dimensions or layout of strips shown but little evidence of any method or explanation provided.
Incorrect answer with no relevant content	**0**	

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