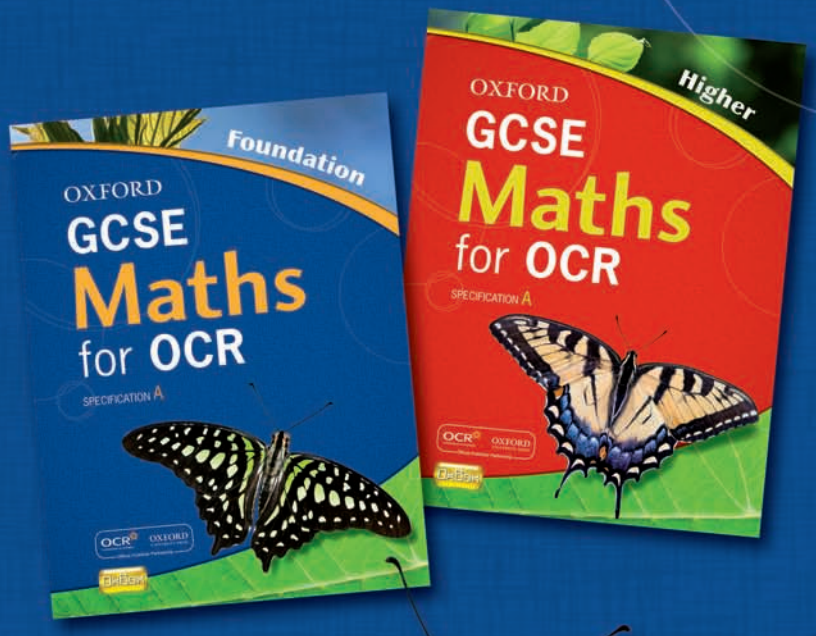
NEW!

# Get ready for changes to GCSE Maths!

# New for 2010 Oxford GCSE Maths for OCR

Specification A

Produced in partnership with OCR, this new course will help your students succeed in 2010

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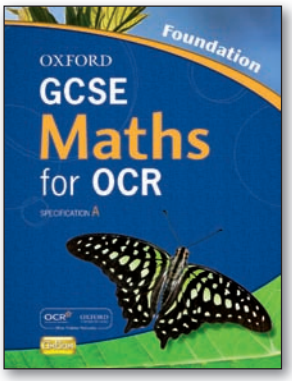
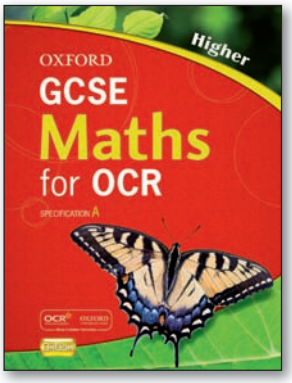
# Oxford and OCR are working together to help your students succeed

NEW for 2010 OCR GCSE Maths Specification A

In **official partnership with OCR** we offer a highly achievable route to success with OCR's flexible new specification, developed with teachers for teachers.




*Oxford GCSE Maths for OCR* provides a comprehensive supporting package for teachers and students following Specification A from 2010, comprising Student Books, Teacher Guides, Practice Books, and OxBox CD-ROMs.

It also provides a great deal of extra help to cope with 2010 changes, especially **AO3 problem-solving, QWC (Quality of Written Communication) and functional maths,** with boosts to help D students up to a C, and C students up to a B.

- A **clear and straightforward** route to exam success, combining clarity and simplicity of approach with rigour and challenge
- **Uniquely graded structure**, enabling students to personalise their learning and gauge their progression
- **Thorough and flexible assessment support**
- Popular OxBox software packed with a huge range of **time-saving and compelling** resources

## Plus popular OxBox software

OxBox

OxBox CD-ROMs provide motivating resources and tools to customise them and to develop more in an incredibly easy-to-use format – see page 6 for more details.

## Evaluation

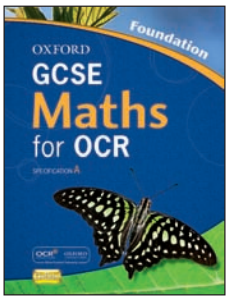
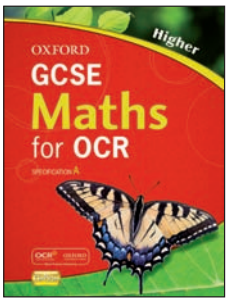
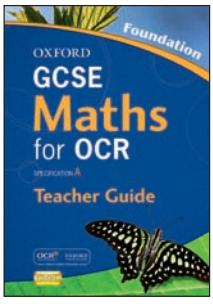
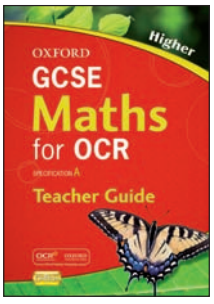
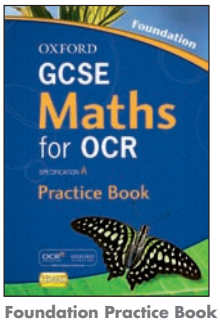
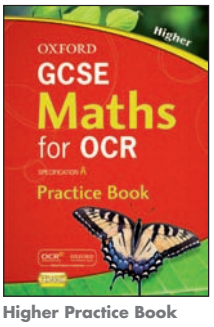
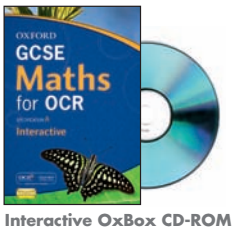
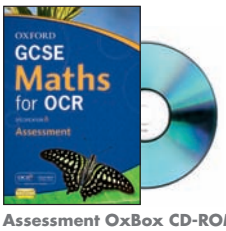
**FREE evaluation for 30 days!**

An Evaluation Pack is available, containing a copy of the Foundation Student Book, Higher Student Book, the Higher Practice Book, plus sample material from the Higher Teacher Guide, and a demonstration disk of the OxBox CD-ROMs.

**Oxford GCSE Maths for OCR Evaluation Pack**
978 019 913927 9 £30.00

# Course structure

*Oxford GCSE Maths for OCR* provides differentiated resources for Foundation and Higher tiers, with a particular focus on **targeting attainment** at the C/D borderline, plus **stretch and challenge** for all students across the A*-G spectrum.

| | FOUNDATION | HIGHER | |
|---|---|---|---|
| **Student Books** |  <br>**Foundation Student Book**<br>978 019 913929 3 £18.00 |  <br>**Higher Student Book**<br>978 019 913928 6 £18.00 | **Student Books**<br>The two spread-based Student Books provide **simplicity, pace, flexibility, and engagement**, with objectives clearly labelled and **arranged as they appear in the specification**. There is overlap between the Foundation and Higher books at the C/D borderline level, with particular emphasis in the Foundation book on **boosting D grades up to C**. |
| **Teacher Guides** |  <br>**Foundation Teacher Guide**<br>978 019 912728 3 £75.00 |  <br>**Higher Teacher Guide**<br>978 019 912729 0 £75,00 | **Teacher Guides**<br>Comprehensive teacher resources are full of practical and accessible lesson plans. They are designed to make teaching easier for the whole range of teaching experience and needs, including NQTs and non-specialists, and have a particular focus on the new processes. |
| **Practice Book** |  <br>**Foundation Practice Book**<br>978 019 913930 9 £6.50 |  <br>**Higher Practice Book**<br>978 019 913931 6 £6.50 | **Practice Books**<br>In addition, two handy pocket-size Practice Books, one for Foundation and one for Higher, complement the Student Books. As well as plenty of extra material to practise essential concepts, each Practice Book contains a free CD of extra material, including PowerPoint worked examples. |
| **Software** |  <br>**Interactive OxBox CD-ROM**<br>978 019 913932 3 £400.00 + VAT |  <br>**Assessment OxBox CD-ROM**<br>978 019 912730 6 £300.00 + VAT | **OxBox CD-ROMs**<br>Popular OxBox software provides unique electronic support for *Oxford GCSE Maths for OCR*, to bring **engagement** to your GCSE maths classroom as well as **save you an incredible amount of time**. |

OXFORD GCSE Maths for OCR

# Student Books and Practice Books

## Foundation

Intro pages in both Student Books set learning in an engaging context

'Check in' sections to make sure students have the necessary knowledge to start a new topic

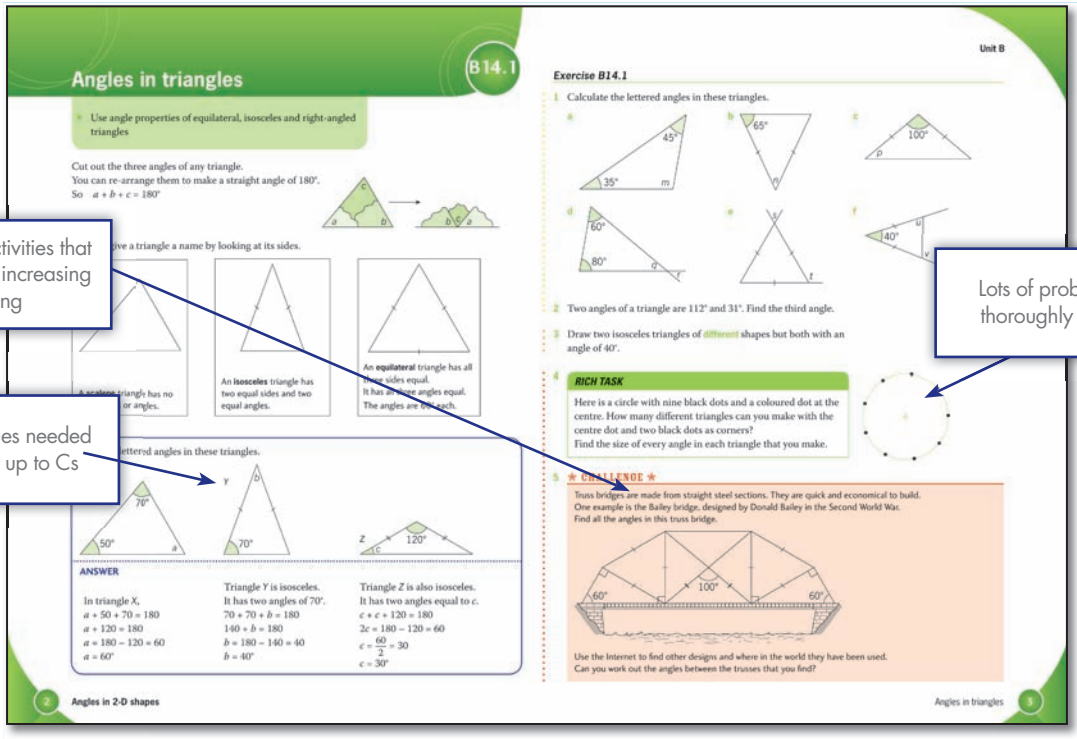
Rich tasks to practise a variety of skills and knowledge


**Foundation Student Book**

Functional maths activities that will engage pupils, increasing understanding

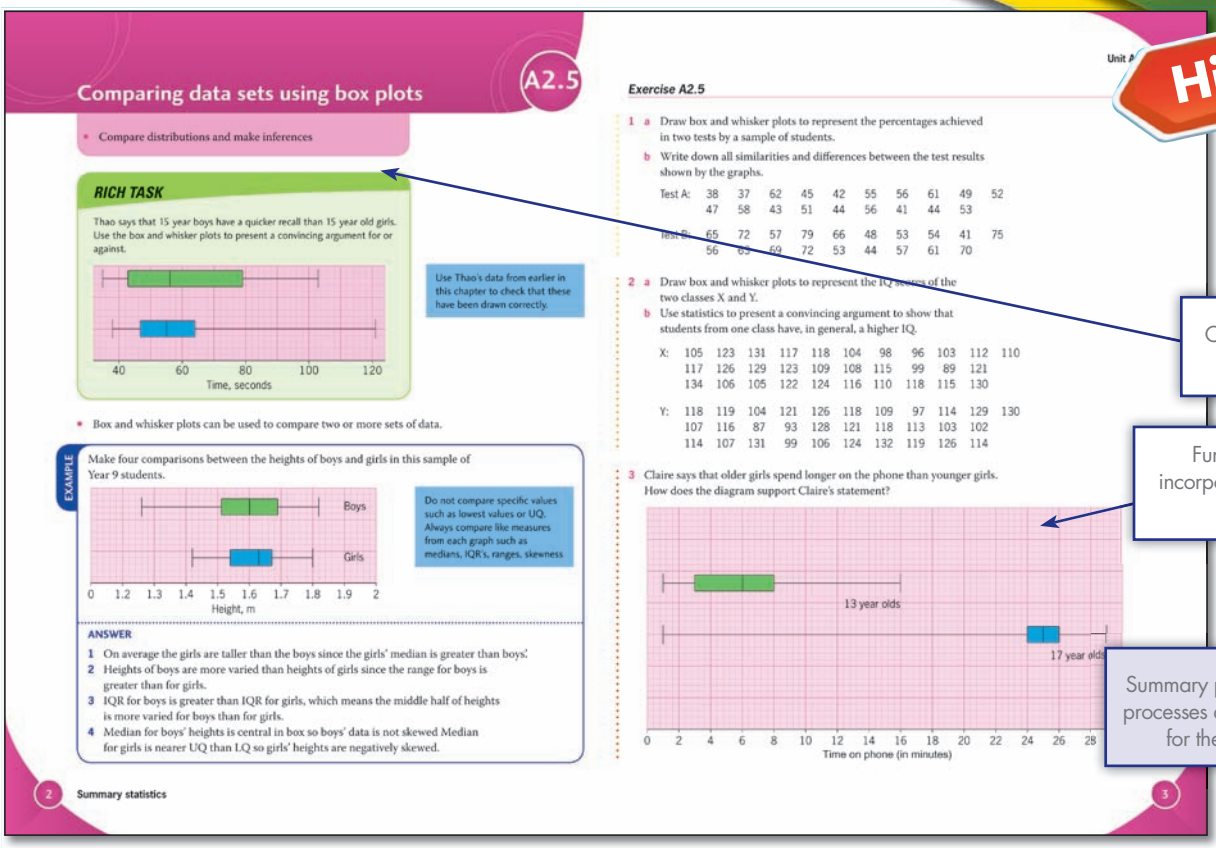
Focus on techniques needed to boost your Ds up to Cs

Lots of problem solving to thoroughly address AO3




**Foundation Student Book**

Higher



## Comparing data sets using box plots

A2.5

- Compare distributions and make inferences

**RICH TASK**

Thao says that 15 year boys have a quicker recall than 15 year old girls. Use the box and whisker plots to present a convincing argument for or against.



Use Thao's data from earlier in this chapter to check that these have been drawn correctly.

- Box and whisker plots can be used to compare two or more sets of data.

**EXAMPLE**

Make four comparisons between the heights of boys and girls in this sample of Year 9 students.



Do not compare specific values such as lowest values or UQ. Always compare like measures from each graph such as medians, IQR's, ranges, skewness

**ANSWER**

1. On average the girls are taller than the boys since the girls' median is greater than boys.'
2. Heights of boys are more varied than heights of girls since the range for boys is greater than for girls.
3. IQR for boys is greater than IQR for girls, which means the middle half of heights is more varied for boys than for girls.
4. Median for boys' heights is central in box so boys' data is not skewed Median for girls is nearer UQ than LQ so girls' heights are negatively skewed.

2 Summary statistics

Unit A

**Exercise A2.5**

1 a Draw box and whisker plots to represent the percentages achieved in two tests by a sample of students.

b Write down all similarities and differences between the test results shown by the graphs.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test A: | 38 | 37 | 62 | 45 | 42 | 55 | 56 | 61 | 49 | 52 |
| | 47 | 58 | 43 | 51 | 44 | 56 | 41 | 44 | 53 | |
| Test B: | 65 | 72 | 57 | 79 | 66 | 48 | 53 | 54 | 41 | 75 |
| | 56 | 65 | 69 | 72 | 53 | 44 | 57 | 61 | 70 | |

2 a Draw box and whisker plots to represent the IQ scores of the two classes X and Y.

b Use statistics to present a convincing argument to show that students from one class have, in general, a higher IQ.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X: | 105 | 123 | 131 | 117 | 118 | 104 | 98 | 96 | 103 | 112 | 110 |
| | 117 | 126 | 129 | 123 | 109 | 108 | 115 | 99 | 89 | 121 | |
| | 134 | 106 | 105 | 122 | 124 | 116 | 110 | 118 | 115 | 130 | |
| Y: | 118 | 119 | 104 | 121 | 126 | 118 | 109 | 97 | 114 | 129 | 130 |
| | 107 | 116 | 87 | 93 | 128 | 121 | 118 | 113 | 103 | 102 | |
| | 114 | 107 | 131 | 99 | 106 | 124 | 132 | 119 | 126 | 114 | |

3 Claire says that older girls spend longer on the phone than younger girls. How does the diagram support Claire's statement?



3

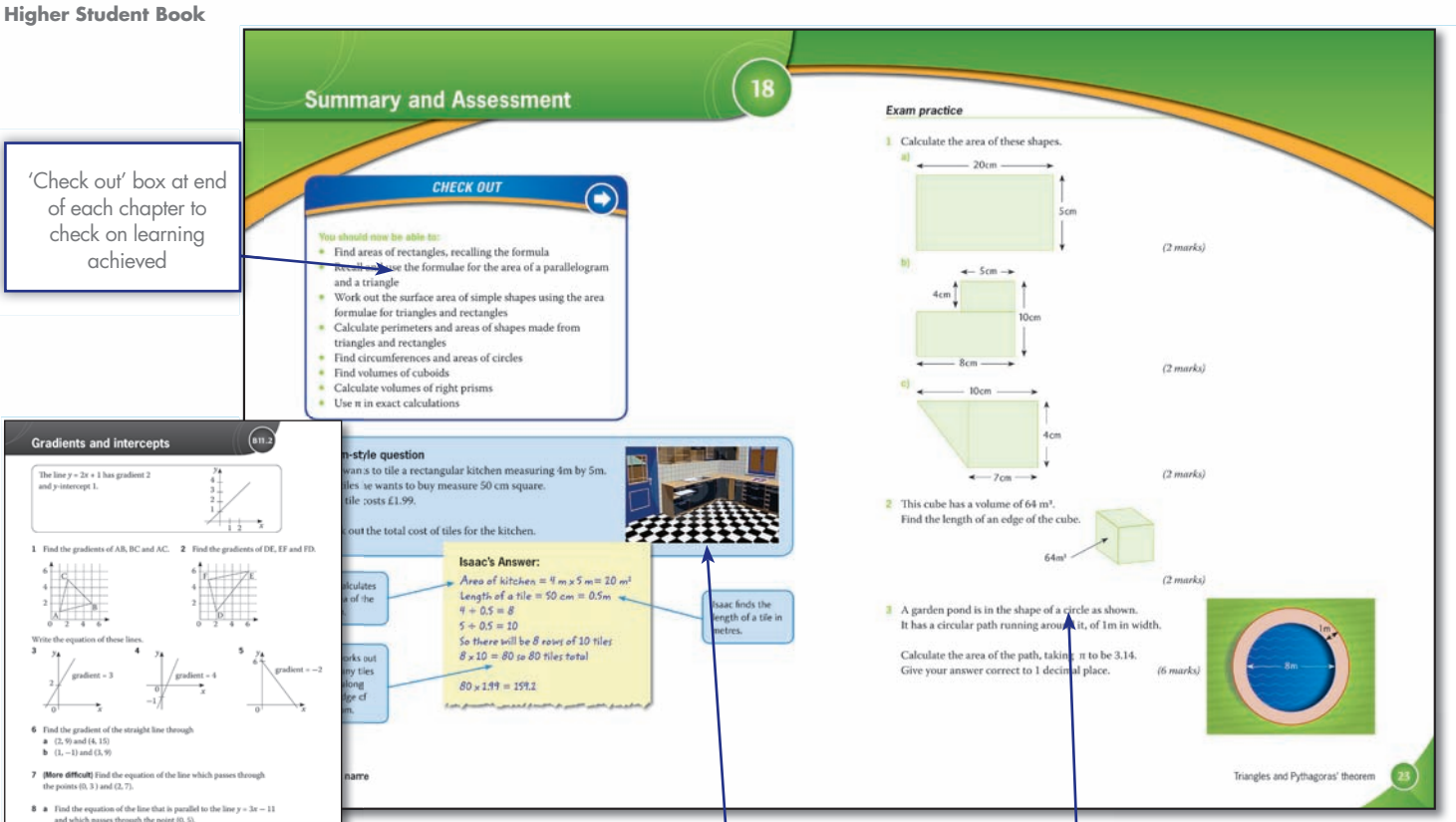
Objectives clearly stated from the start

Functional maths fully incorporated and embedded throughout

Summary pages focus on the key processes and techniques needed for the new assessments

**Higher Student Book**

'Check out' box at end of each chapter to check on learning achieved



## Summary and Assessment

18

**CHECK OUT**

You should now be able to:

- Find areas of rectangles, recalling the formula
- Recall and use the formulae for the area of a parallelogram and a triangle
- Work out the surface area of simple shapes using the area formulae for triangles and rectangles
- Calculate perimeters and areas of shapes made from triangles and rectangles
- Find circumferences and areas of circles
- Find volumes of cuboids
- Calculate volumes of right prisms
- Use π in exact calculations

**Exam practice**

1 Calculate the area of these shapes.

a)



(2 marks)

b)



(2 marks)

c)



(2 marks)

2 This cube has a volume of 64 m³. Find the length of an edge of the cube.



(2 marks)

3 A garden pond is in the shape of a circle as shown. It has a circular path running around it, of 1m in width.

Calculate the area of the path, taking π to be 3.14. Give your answer correct to 1 decimal place. (6 marks)



Triangles and Pythagoras' theorem 25

**n-style question**

wan:s to tile a rectangular kitchen measuring 4m by 5m.
les se wants to buy measure 50 cm square.
tile :osts £1.99.
out the total cost of tiles for the kitchen.

**Isaac's Answer:**

Area of kitchen = 4 m × 5 m = 20 m²
Length of a tile = 50 cm = 0.5m
4 ÷ 0.5 = 8
5 ÷ 0.5 = 10
So there will be 8 rows of 10 tiles
8 × 10 = 80 so 80 tiles total
80 × 1.99 = 159.2

Isaac finds the length of a tile in metres.

narre



## Gradients and intercepts

B11.2

The line $y = 2x + 1$ has gradient 2 and y-intercept 1.

1 Find the gradients of AB, BC and AC. 2 Find the gradients of DE, EF and FD.

Write the equation of these lines.

3 gradient = 3

4 gradient = 4

5 gradient = −2

6 Find the gradient of the straight line through
a (2, 9) and (4, 15)
b (1, −1) and (3, 9)

7 (More difficult) Find the equation of the line which passes through the points (0, 3) and (2, 7).

8 a Find the equation of the line that is parallel to the line $y = 3x - 11$ and which passes through the point (0, 5).
b Find the equation of the line which is perpendicular to the line $y = 2x + 5$ and which passes through the origin.

Straight lines 73

**Higher Practice Book**

**Higher Student Book**

Practice Books provide plenty of extra exercises, worked examples and reminders

Worked questions show how to improve performance

Exam style questions written specifically for the new exams help preparation

OXFORD GCSE Maths for OCR

# Comes with OxBox software!

Popular OxBox software gives you an extensive bank of highly visual, compelling, interactive resources, lesson plans, and formative and summative assessement, and is incredibly easy to use and customise to suit your own unique requirements.

**STOP PRESS!**
Watch out for *Oxford GCSE Maths for OCR* Revision Guides, to fully prepare your students' for the new-style assessments. Revision Guides will be available in 2010.

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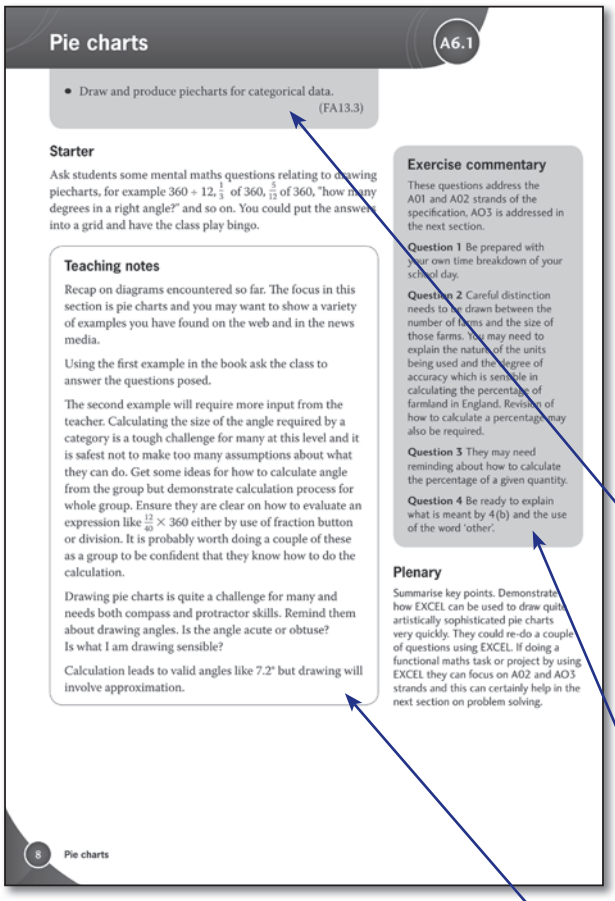
# Teacher Guides



## Pie charts A6.1

- Draw and produce piecharts for categorical data. (FA13.3)

**Starter**

Ask students some mental maths questions relating to drawing piecharts, for example 360 ÷ 12, $\frac{1}{3}$ of 360, $\frac{3}{15}$ of 360, "how many degrees in a right angle?" and so on. You could put the answers into a grid and have the class play bingo.

**Teaching notes**

Recap on diagrams encountered so far. The focus in this section is pie charts and you may want to show a variety of examples you have found on the web and in the news media.

Using the first example in the book ask the class to answer the questions posed.

The second example will require more input from the teacher. Calculating the size of the angle required by a category is a tough challenge for many at this level and it is safest not to make too many assumptions about what they can do. Get some ideas for how to calculate angle from the group but demonstrate calculation process for whole group. Ensure they are clear on how to evaluate an expression like $\frac{12}{50} \times 360$ either by use of fraction button or division. It is probably worth doing a couple of these as a group to be confident that they know how to do the calculation.

Drawing pie charts is quite a challenge for many and needs both compass and protractor skills. Remind them about drawing angles. Is the angle acute or obtuse? Is what I am drawing sensible?

Calculation leads to valid angles like 7.2° but drawing will involve approximation.

**Exercise commentary**

These questions address the A01 and A02 strands of the specification, AO3 is addressed in the next section.

**Question 1** Be prepared with your own time breakdown of your school day.

**Question 2** Careful distinction needs to be drawn between the number of farms and the size of those farms. You may need to explain the nature of the units being used and the degree of accuracy which is sensible in calculating the percentage of farmland in England. Revision of how to calculate a percentage may also be required.

**Question 3** They may need reminding about how to calculate the percentage of a given quantity.

**Question 4** Be ready to explain what is meant by 4(b) and the use of the word 'other'.

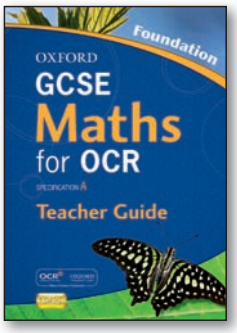
**Plenary**

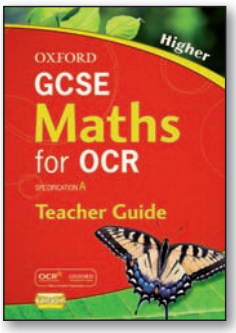
Summarise key points. Demonstrate how EXCEL can be used to draw quite artistically sophisticated pie charts very quickly. They could re-do a couple of questions using EXCEL. If doing a functional maths task or project by using EXCEL they can focus on A02 and AO3 strands and this can certainly help in the next section on problem solving.

8 Pie charts

Objectives clearly stated at beginning of each lesson plan

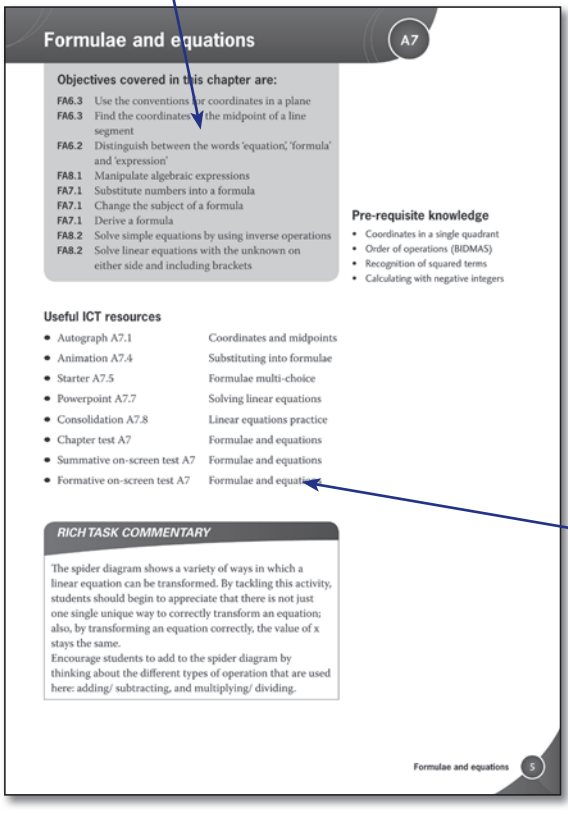
Exercise commentary outlines exactly how the AO1, AO2, and AO3 strands are addressed in Student Book pages




Objectives clearly referenced to Specification A to help your planning

Lesson plans written by experienced teachers with lots of useful and practical suggestions



## Formulae and equations A7

**Objectives covered in this chapter are:**

FA6.3 Use the conventions for coordinates in a plane
FA6.3 Find the coordinates of the midpoint of a line segment
FA6.2 Distinguish between the words 'equation,' 'formula' and 'expression'
FA8.1 Manipulate algebraic expressions
FA7.1 Substitute numbers into a formula
FA7.1 Change the subject of a formula
FA7.1 Derive a formula
FA8.2 Solve simple equations by using inverse operations
FA8.2 Solve linear equations with the unknown on either side and including brackets

**Pre-requisite knowledge**

- Coordinates in a single quadrant
- Order of operations (BIDMAS)
- Recognition of squared terms
- Calculating with negative integers

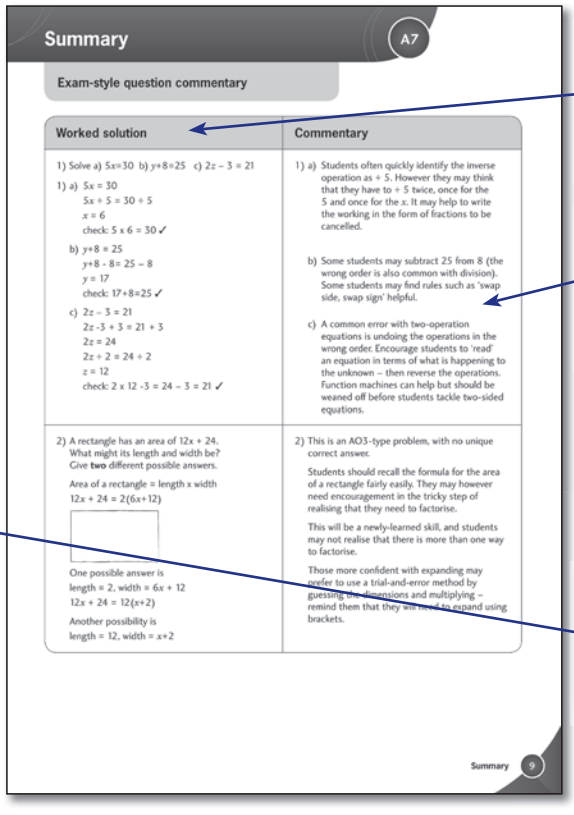
**Useful ICT resources**

| | |
|---|---|
| • Autograph A7.1 | Coordinates and midpoints |
| • Animation A7.4 | Substituting into formulae |
| • Starter A7.5 | Formulae multi-choice |
| • Powerpoint A7.7 | Solving linear equations |
| • Consolidation A7.8 | Linear equations practice |
| • Chapter test A7 | Formulae and equations |
| • Summative on-screen test A7 | Formulae and equations |
| • Formative on-screen test A7 | Formulae and equations |

*RICH TASK COMMENTARY*

The spider diagram shows a variety of ways in which a linear equation can be transformed. By tackling this activity, students should begin to appreciate that there is not just one single unique way to correctly transform an equation; also, by transforming an equation correctly, the value of x stays the same.
Encourage students to add to the spider diagram by thinking about the different types of operation that are used here: adding/ subtracting, and multiplying/ dividing.

Formulae and equations 5



## Summary A7

**Exam-style question commentary**

| Worked solution | Commentary |
|---|---|
| 1) Solve a) $5x=30$ b) $y+8=25$ c) $2z-3=21$<br>1) a) $5x = 30$<br>$5x \div 5 = 30 \div 5$<br>$x = 6$<br>check: $5 \times 6 = 30$ ✓<br>b) $y+8 = 25$<br>$y+8-8 = 25-8$<br>$y = 17$<br>check: $17+8=25$ ✓<br>c) $2z-3 = 21$<br>$2z-3+3 = 21+3$<br>$2z = 24$<br>$2z \div 2 = 24 \div 2$<br>$z = 12$<br>check: $2 \times 12 - 3 = 24 - 3 = 21$ ✓ | 1) a) Students often quickly identify the inverse operation as ÷ 5. However they may think that they have to ÷ 5 twice, once for the 5 and once for the x. It may help to write the working in the form of fractions to be cancelled.<br>b) Some students may subtract 25 from 8 (the wrong order is also common with division). Some students may find rules such as 'swap side, swap sign' helpful.<br>c) A common error with two-operation equations is undoing the operations in the wrong order. Encourage students to 'read' an equation in terms of what is happening to the unknown – then reverse the operations. Function machines can help but should be weaned off before students tackle two-sided equations. |
| 2) A rectangle has an area of $12x + 24$. What might its length and width be? Give **two** different possible answers.<br>Area of a rectangle = length x width<br>$12x + 24 = 2(6x+12)$<br>One possible answer is<br>length = 2, width = $6x + 12$<br>$12x + 24 = 12(x+2)$<br>Another possibility is<br>length = 12, width = $x+2$ | 2) This is an AO3-type problem, with no unique correct answer.<br>Students should recall the formula for the area of a rectangle fairly easily. They may however need encouragement in the tricky step of realising that they need to factorise.<br>This will be a newly-learned skill, and students may not realise that there is more than one way to factorise.<br>Those more confident with expanding may prefer to use a trial-and-error method by guessing the dimensions and multiplying – remind them that they will need to expand using brackets. |

Summary 9

Worked solutions with commentary tackle misconceptions

New AO3 strand addressed throughout

Linked to ICT to enliven your lessons


## Helping your students succeed

- **Clear and straightforward** route to exam success, combining clarity and simplicity of approach with rigour and challenge
- **Uniquely graded structure**, enabling students to personalise their learning and gauge their progression
- **Thorough and flexible assessment support**
- Popular OxBox software packed with a huge range of **time-saving and compelling** resources

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