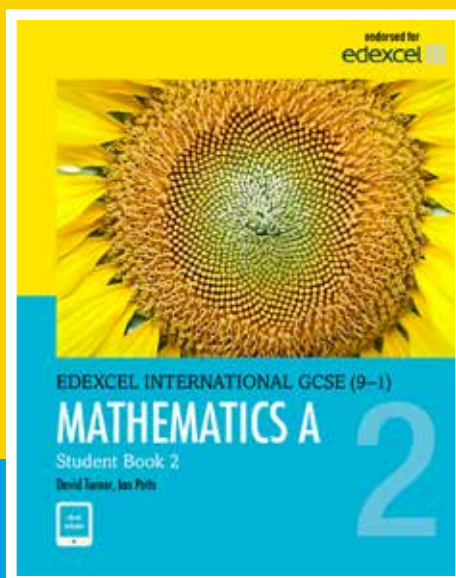
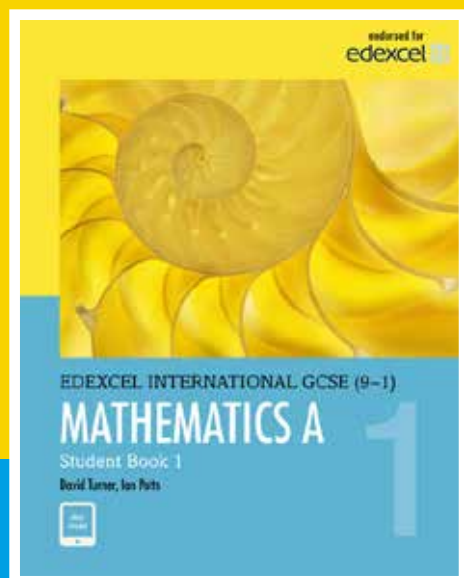


NEW FOR 2017



A GUIDE TO EDEXCEL INTERNATIONAL GCSE (9–1) MATHEMATICS

Published resources for UK schools

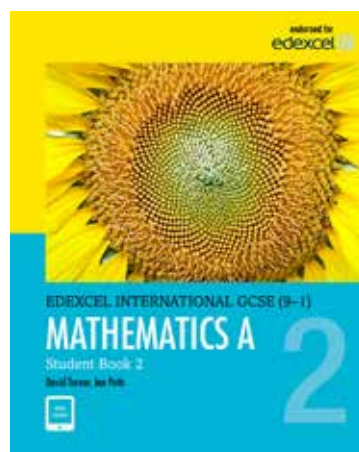
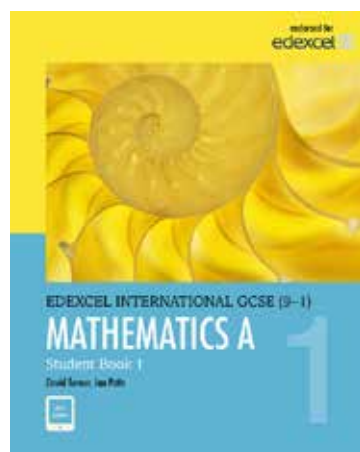
RESOURCES FOR THE NEW EDEXCEL INTERNATIONAL GCSE (9–1) MATHEMATICS

Introducing a completely new series of print and online resources for the latest **Edexcel GCSE (9–1) Mathematics** specifications from 2016.

Written for the **new 9–1** grading scale, with **progression, relevance** and **support** at their core, our resources provide comprehensive coverage of the new specifications and are designed to supply students with the best preparation possible for the examination.

Subjects at a glance

Mathematics A ● Further Pure Mathematics



Why choose the new Edexcel International GCSE (9–1) Mathematics?

A new 9–1 grading scale

These resources are for the new 9–1 grading scale, which replaces the old A*–G grading scale, allowing greater differentiation of student achievement. It also brings student assessment in line with the UK GCSE.

Embedded transferrable skills

Transferable skills, needed for progression into higher education and employment, are explicitly signposted through the Student Books – this means students can understand and fully engage with the skills they're gaining.

Supporting learning beyond the classroom

Each Student Book provides access to an ActiveBook, a digital version of the Student Book, which can be accessed online anytime and anywhere, encouraging independent learning.

Pearson Progression Scale and Map tools

Developed by teachers and tested by experts, the Pearson Progression Scale and Map tools help you to identify students' areas of strengths and weaknesses, and support them to progress through their learning.

Better support for you

The ActiveLearn Digital Service and the online teacher resources provide a range of planning, teaching, tracking and assessment resources, saving you valuable time.

Developed to support all learners

The resource content has been specifically developed to be engaging and appropriate for learners of all abilities.



To see the full range of resources available for the new Edexcel International GCSE (9–1) specifications, visit: www.pearsonschools.co.uk/InternationalGCSE2017

Supporting student progression and academic achievement

With each Student Book providing **FREE online access** to a digital version of the textbooks, these resources encourage independent learning and set students on the right track for the exam.

Our **course structure** is **simple, cyclical** and **cumulative**. It reflects how students learn maths. All examination specification content is covered as indicated in our schemes of work.

COURSE STRUCTURE		COURSE STRUCTURE	
UNIT 1	UNIT 2	UNIT 3	UNIT 4
NUMBER 1 ■ WORKING WITH FRACTIONS ■ ORDER OF OPERATIONS (BODMAS) ■ SIGNIFICANT FIGURES AND DECIMAL PLACES ■ EXAM PRACTICE ■ SUMMARY	NUMBER 2 ■ STANDARD FORM ■ PERCENTAGES ■ PERCENTAGE INCREASE AND DECREASE ■ EXAM PRACTICE ■ SUMMARY	NUMBER 3 ■ PRIME FACTORS ■ HCF AND LCM ■ RATIO ■ EXAM PRACTICE ■ SUMMARY	NUMBER 4 ■ COMPOUND PERCENTAGES ■ INVERSE PERCENTAGES ■ EXAM PRACTICE ■ SUMMARY
ALGEBRA 1 ■ SIMPLIFYING ALGEBRAIC EXPRESSIONS ■ SIMPLIFYING ALGEBRAIC EXPRESSIONS WITH BRACKETS ■ SOLVING EQUATIONS ■ SOLVING INEQUALITIES ■ EXAM PRACTICE ■ SUMMARY	ALGEBRA 2 ■ SIMPLIFYING ALGEBRAIC EXPRESSIONS ■ SOLVING EQUATIONS WITH ROOTS AND POWERS ■ POSITIVE INTEGER INDICES ■ INEQUALITIES ■ EXAM PRACTICE ■ SUMMARY	ALGEBRA 3 ■ SIMPLE FACTORISING ■ SIMPLIFYING FRACTIONS ■ SOLVING EQUATIONS WITH FRACTIONS ■ SIMULTANEOUS EQUATIONS ■ EXAM PRACTICE ■ SUMMARY	ALGEBRA 4 ■ USING FORMULAE ■ CHANGE OF SUBJECT ■ FURTHER FORMULAE ■ EXAM PRACTICE ■ SUMMARY
GRAPHS 1 ■ GRADIENT OF A STRAIGHT LINE ■ PLOTTING STRAIGHT-LINE GRAPHS ■ STRAIGHT-LINE CONVERSION GRAPHS ■ EXAM PRACTICE ■ SUMMARY	GRAPHS 2 ■ STRAIGHT-LINE GRAPHS ■ SKETCHING STRAIGHT-LINE GRAPHS ■ SIMULTANEOUS EQUATIONS ■ EXAM PRACTICE ■ SUMMARY	GRAPHS 3 ■ QUADRATIC-TIME GRAPHS ■ SPEED-TIME GRAPHS ■ EXAM PRACTICE ■ SUMMARY	GRAPHS 4 ■ QUADRATIC GRAPHS ■ SOLUTION OF $y = ax^2 + bx + c$ ■ EXAM PRACTICE ■ SUMMARY
SHAPE AND SPACE 1 ■ TRIANGLES ■ QUADRILATERALS ■ POLYGONS ■ CONSTRUCTIONS ■ EXAM PRACTICE ■ SUMMARY	SHAPE AND SPACE 2 ■ PYTHAGORAS' THEOREM ■ CIRCLE THEOREMS ■ EXAM PRACTICE ■ SUMMARY	SHAPE AND SPACE 3 ■ TANGENT RATIO ■ PYTHAGORAS' THEOREM ■ CALCULATING SIDES ■ CALCULATING ANGLES ■ EXAM PRACTICE ■ SUMMARY	SHAPE AND SPACE 4 ■ SINE AND COSINE RATIOS ■ CALCULATING SIDES ■ CALCULATING ANGLES ■ MIXED QUESTIONS ■ EXAM PRACTICE ■ SUMMARY
			UNIT 5 NUMBER 5 ■ CALCULATORS ■ ESTIMATING ■ ROUNDING, UPPER AND LOWER BOUNDS ■ EXAM PRACTICE ■ SUMMARY
			ALGEBRA 5 ■ MULTIPLYING BRACKETS ■ FACTORISING QUADRATIC EXPRESSIONS ■ SOLVING QUADRATIC EQUATIONS BY FACTORISATION ■ PROBLEMS LEADING TO QUADRATIC EQUATIONS ■ EXAM PRACTICE ■ SUMMARY
			GRAPHS 5 ■ REPRESENTING INEQUALITIES GRAPHICALLY ■ PERPENDICULAR LINES ■ MID-POINTS ■ USING PYTHAGORAS' THEOREM ■ EXAM PRACTICE ■ SUMMARY
			SHAPE AND SPACE 5 ■ TRANSFORMATIONS ■ TRANSLATIONS ■ REFLECTIONS AND ROTATIONS ■ ENLARGEMENTS ■ CONSTRUCTIONS ■ EXAM PRACTICE ■ SUMMARY
			FACT FINDERS ■ ANTS ■ FRAGILE EARTH ■ GREAT WHITE SHARK ■ LONDON 2012 OLYMPIC GAMES ■ THE INCREDIBLE HUMAN BODY
			CHALLENGES

Table of Contents and Course Structure from the Edexcel International GCSE (9–1) Mathematics A Student Book

Exam practice tests for every chapter provide quick, effective feedback on students' progress. In addition, **Exam Practice Papers** are provided for further revision.

EXAMINATION PRACTICE PAPERS

PAPER 1

1 The surface area of the Earth is $5.1 \times 10^8 \text{ km}^2$. The surface area of the Pacific Ocean is $1.8 \times 10^8 \text{ km}^2$.

a Express the area of the Pacific Ocean as a percentage of the area of the surface area of the Earth. Give your answer correct to 3 significant figures. [2]

The surface area of the Arctic Ocean is $1.4 \times 10^7 \text{ km}^2$. The surface area of the Southern Ocean is $3.5 \times 10^7 \text{ km}^2$.

b Find the ratio of the surface area of the Arctic Ocean to the surface area of the Southern Ocean in the form 1 : n. [2]

2 a Expand $5(2y - 3)$. [1]
b Expand and simplify $(2x - 1)(x + 5)$. [2]
c Factorise $4x^2 + 24x$. [2]
d Factorise $2x^2 - 22x$. [2]
e Solve $3(3x - 2) = 21$. [2]

3 a Plot the points A(2, 1) and B(8, 5) on a centimetre graph. [1]
b Find the coordinates of the point M, the midpoint of the line segment AB. [2]
c Find the coordinates of the point N, the point on the line segment AB such that $AN : NB = 1 : 2$. [2]
d Find the equation of the line passing through M and N. [2]
e Find the equation of the line perpendicular to MN passing through M. [2]
f Find the equation of the line perpendicular to MN passing through N. [2]

EXAMINATION PRACTICE PAPER ANSWERS

Paper 1

1 a Both 10^8 factors cancel out.
 $\frac{1.8}{5.1} \times 100 = 35.29\ldots = 35.3\% \text{ (3 s.f.)}$

b Divide both sides by 2 when ratio is 2:5 or divide both sides by 1.4 when ratio is 1.4:3.5
 $1.4:3.5 = 14:35 = 2:5 = 1:2.5$

2 a Multiply each term in the bracket by 5.
 $5(2y - 3) = 10y - 15$

b 'FOIL' expansion and simplification.
 $(2x - 1)(x + 5) = 2x^2 + 10x - x - 5 = 2x^2 + 9x - 5$

c Common factor $4y$ produces the given product of $4y(1 + 6z)$.
 $4y + 24yz = 4y(1 + 6z)$

d Common factor $2x$ produces the given product of $2x(x - 11)$.
 $2x^2 - 22x = 2x(x - 11)$

e Divide both sides by 3.
 $3x - 2 = 7$
Add 2 to both sides.

Multiply through by 2 to express equation as desired.
 $y = -\frac{3}{2}x + 10\frac{1}{2}$
 $2y = -3x + 21$
 $3x + 2y - 21 = 0$

4 a $7x - 11 > 3$
Add 11 to both sides and then divide by 7.
 $7x > 14$
 $x > 2$

b $\frac{1}{2} < x < 2$

5 a Median is at $\frac{1}{2}(n + 1)$ th position.
Median score is at the 8th position.
Median score = 2

b mean = $\frac{\sum fx}{\sum f}$
Mean = $\frac{5 \times 1 + 4 \times 2 + \dots + 1 \times 5}{15} = \frac{37}{15} = 2.47 \text{ (3 s.f.)}$

6 a $P(A \text{ or } B) = P(A) + P(B)$ if A, B independent.

Sample pages taken from Edexcel International GCSE (9–1) Mathematics A Student Book 2

Worked solutions provide step-by-step guidance for answering exam practice questions.

Points of interest plus learning in a real-world context make content engaging for all learners.

Learning objectives provide a clear focus for each lesson, showing what students will be learning.

Chapter summaries reinforce the key learning points of each chapter.

Assumed knowledge and key concepts are outlined.

ALGEBRA 9

One of the most famous theorems in mathematics is Fermat's Last Theorem which states that $x^n + y^n = z^n$ has no non-zero integer solutions when $n > 2$. Fermat wrote in the margin of his notebook in 1637 'I have discovered a truly remarkable proof which this margin is too small to contain'. Encouraged by this statement, mathematicians struggled for 358 years to prove this theorem before a proof was published in 1995 by Andrew Wiles. The proof itself is over 150 pages long and took seven years to complete.

LEARNING OBJECTIVES

- Solve simultaneous equations with one equation being quadratic
- Solve simultaneous equations with one equation being a circle
- Prove a result using algebra

BASIC PRINCIPLES

- Solve quadratic equations (using factorisation or the quadratic formula).
- Solve simultaneous equations (by substitution, elimination or graphically).
- Expand brackets.
- Expand the product of two linear expressions.
- Form and simplify expressions.
- Factorise expressions.
- Complete the square for a quadratic expression.

SOLVING TWO SIMULTANEOUS EQUATIONS – ONE LINEAR AND ONE NON-LINEAR

ACTIVITY 1

Use the graph to solve the simultaneous equations $x + 2y = 10$ and $x^2 + y^2 = 25$. What is the connection between the line $3y = 4x - 25$ and the circle $x^2 + y^2 = 25$? Are there any real solutions to the simultaneous equations $3y = 18 - x$ and $x^2 + y^2 = 25$?

Sample page taken from Edexcel International GCSE (9–1) Mathematics A Student Book

Key point boxes summarise the essential concepts, and are ideal for revision.

Non-starred exercises work towards the new grades 1–6, helping to clearly identify the level of difficulty.

Starred exercises work towards grades 6–9 helping students progress and reach their full potential.

ALGEBRA 9

UNIT 9

KEY POINTS

- If the two equations are of the form $y = f(x)$ and $y = g(x)$:
 - Solve the equation $f(x) = g(x)$ to find x .
 - When x has been found, find y using the easier of the original equations.
 - Write out your solutions in the correct pairs.

EXERCISE 1

Solve the simultaneous equations.

1 $y = x + 6, y = x^2$ 5 $y = x + 1, y = x^2 - 2x + 3$
2 $y = 2x + 3, y = x^2$ 6 $y = x - 1, y = x^2 + 2x - 7$
3 $y = 3x + 4, y = x^2$ 7 $y = x + 1, y = \frac{2}{x}$
4 $y = 2x + 8, y = x^2$ 8 $y = 1 + \frac{2}{x}, y = x$

EXERCISE 1*

Solve the simultaneous equations, giving your answers correct to 3 s.f. where appropriate.

1 $y = 2x - 1, y = x^2 + 4x - 6$ 5 $y = x + 2, y = \frac{8}{x}$
2 $y = 3x + 1, y = x^2 - x + 2$ 6 $y = 1 + \frac{2}{x}, y = \frac{3}{x^2}$
3 $y = 4x + 2, y = x^2 + x - 5$ 7 $y = 3\sqrt{x}, y = x + 1$
4 $y = 1 - 3x, y = x^2 - 7x + 3$ 8 $y = 1 + \frac{15}{x^2}, y = \frac{8}{x^2}$

Example 2 shows how to solve algebraically the pair of simultaneous equations from Activity 1.

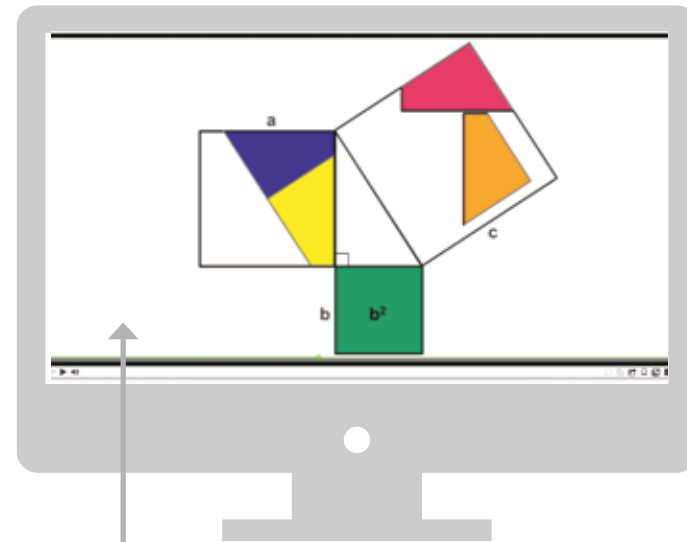
Progression icons show the level of difficulty according to the Pearson International GCSE Maths Progression Scale.

More difficult questions appear at the end of some exercises. Identified by green question numbers, they are ideal to further challenge more able students.

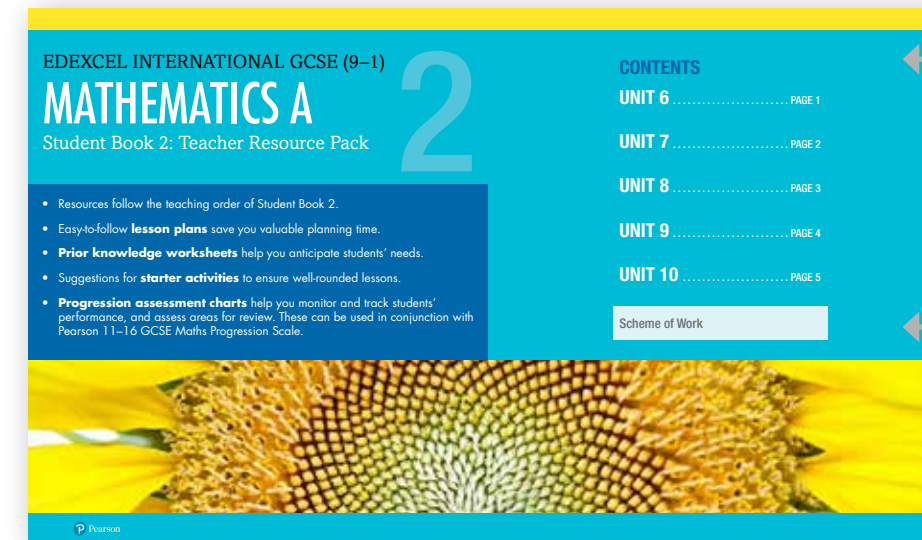
Better support for you

The **ActiveLearn Digital Service** and **online Teacher Resource Pack** provide a range of planning, teaching, tracking and assessment materials to save you time and check all your students are on track for the exam.

- **Lesson plans** give you everything you need to successfully deliver the content required.
- **Prior knowledge worksheets** help assess students' understanding of key topics.
- **Videos, animations, and starter activities** help introduce and explain new concepts while engaging students from the start.



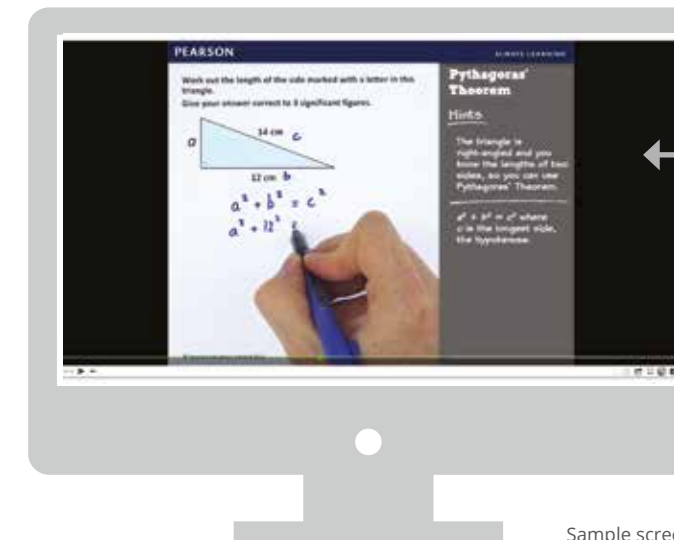
Over 200 videos and animations bring maths to life, and can be used for presentations, reinforcement or to demonstrate worked solutions.



Sample screen taken from Edexcel International GCSE (9-1) Mathematics A Teacher Resource Pack

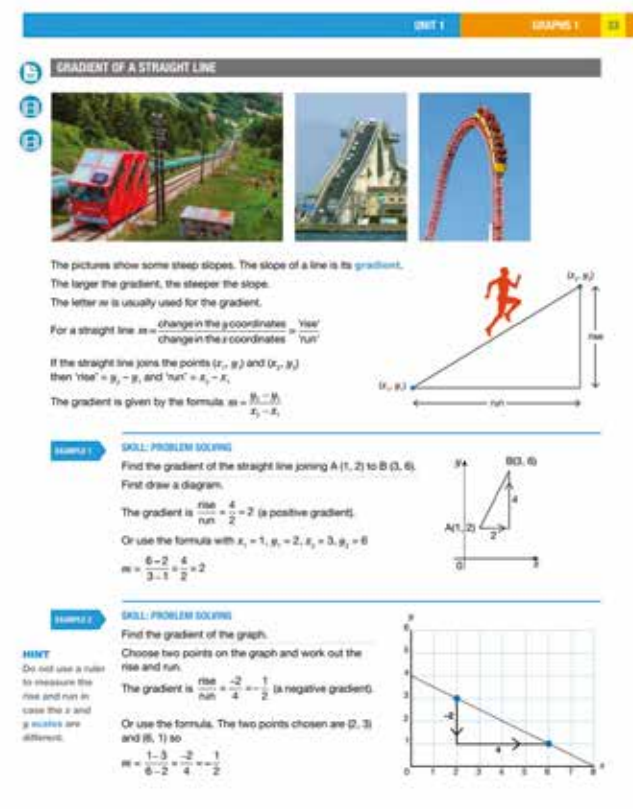
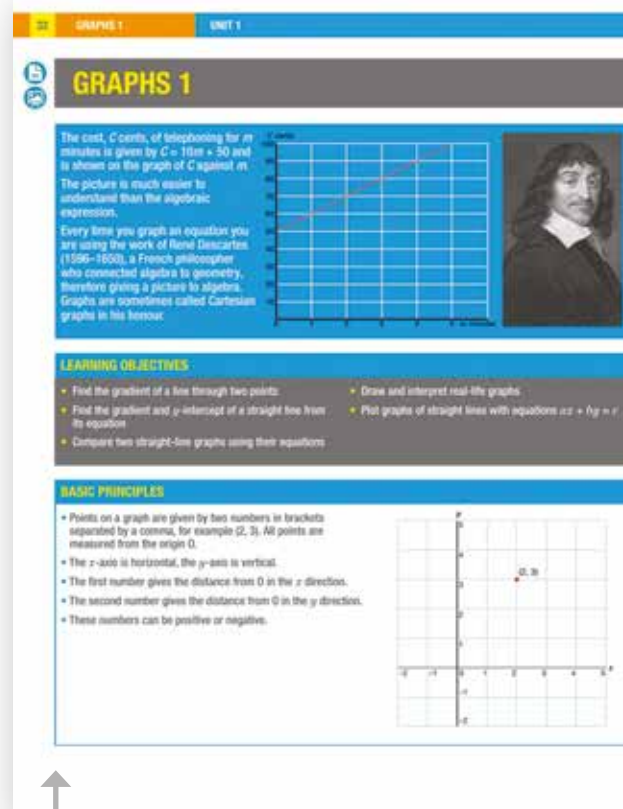
The **Teacher Resource Pack** is a one-stop-shop for planning and teaching resources, and includes extra materials such as self-assessment sheets for students.

All course content is covered by **lesson plans**, which include the examination Specification reference (Foundation or Higher Tier). These are all referred to in our course-specific Scheme of Work to help you plan your teaching year.



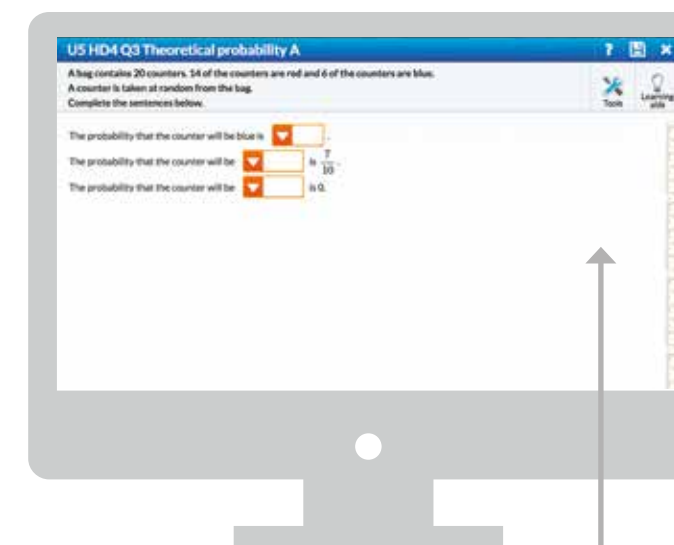
Visual reinforcement of worked solutions with hints and guidance about common errors helps consolidate students' understanding of topics and skills.

Sample screens taken from Edexcel International GCSE (9-1) Mathematics A Teacher Resource Pack

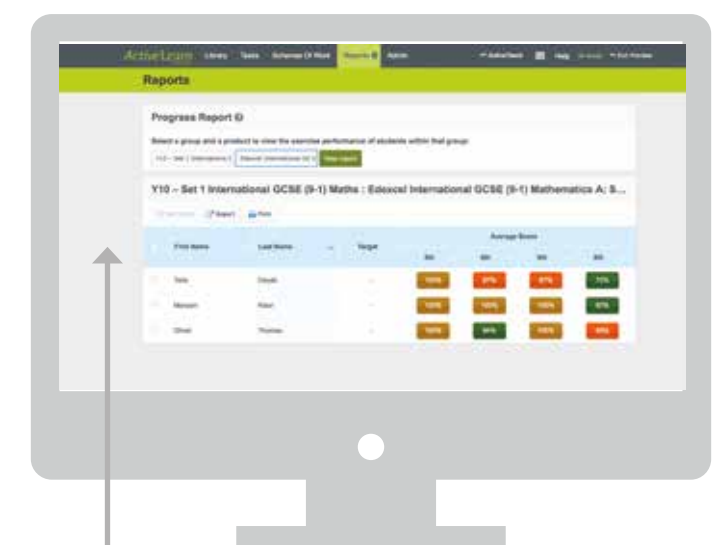


Sample pages taken from Edexcel International GCSE (9-1) Mathematics A Student Book

The **Teacher's ActiveBook** has full front-of-class functionality and includes a wealth of supporting resources.



The **ActiveLearn course activities** can be assigned for students to complete in their own time.



Progress reports can be used to track the performance of your class, and will highlight particular student difficulties or achievements.

Next steps

Try for yourself

View or download sample pages from the Edexcel International GCSE (9–1) Mathematics Student Books at:
www.pearsonschools.co.uk/TryIntGCSEMaths

Buy Online

Save up to 20% when you buy online.
www.pearsonschools.co.uk/BuyIntGCSEMaths

Speak to us

Talk to one of our Curriculum Support Consultants to understand what's right for you and your students.
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