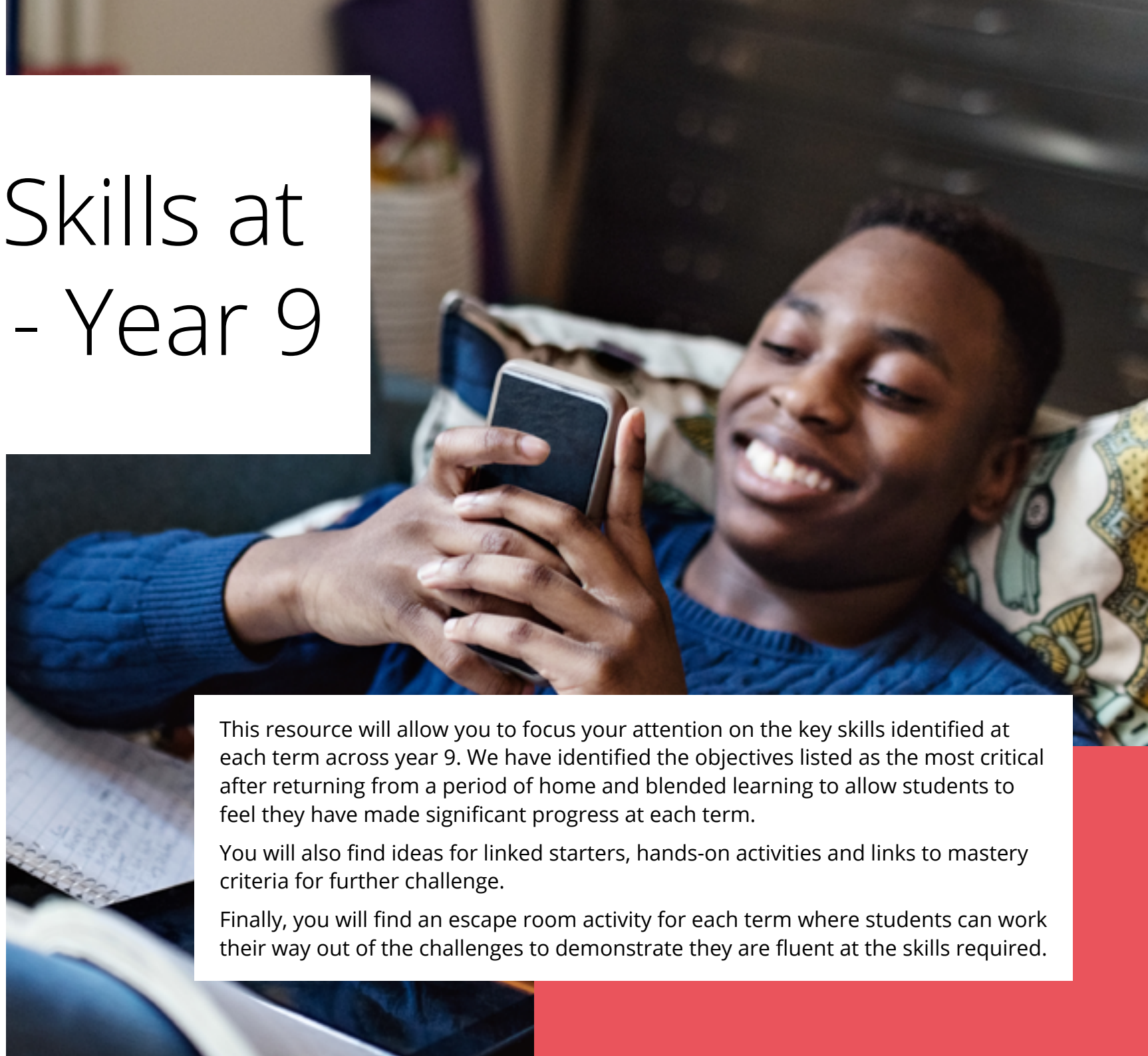


Key Skills at KS3 - Year 9



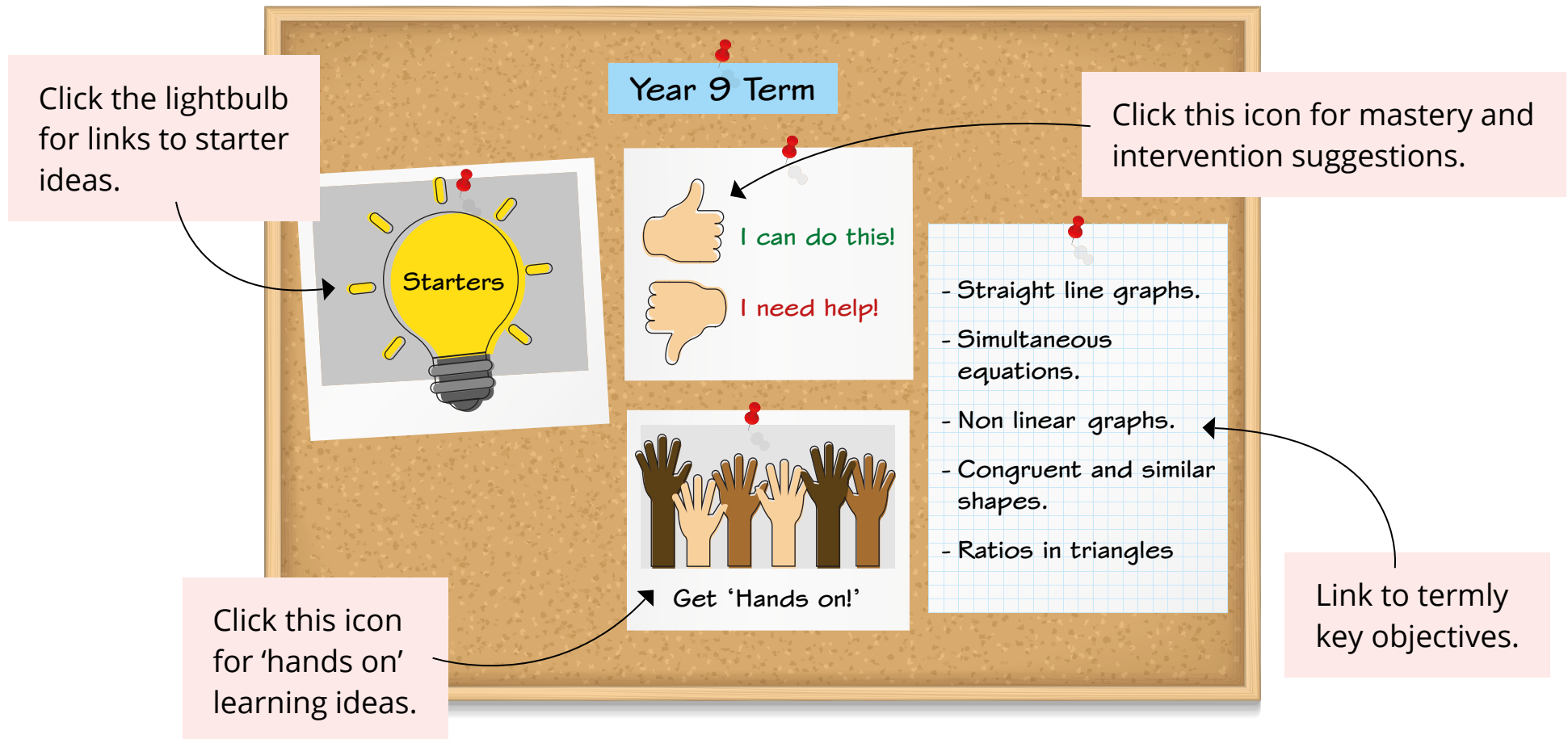
This resource will allow you to focus your attention on the key skills identified at each term across year 9. We have identified the objectives listed as the most critical after returning from a period of home and blended learning to allow students to feel they have made significant progress at each term.

You will also find ideas for linked starters, hands-on activities and links to mastery criteria for further challenge.

Finally, you will find an escape room activity for each term where students can work their way out of the challenges to demonstrate they are fluent at the skills required.

How to use this resource...

Each term has its own 'virtual noticeboard'. Each noticeboard will have four links to all the information you will need to teach year 9 each term.



Key Skills for Term 1

Get 'Hands on!'

Key Skills for Term 2

Get 'Hands on!'

Key Skills for Term 3

Get 'Hands on!'

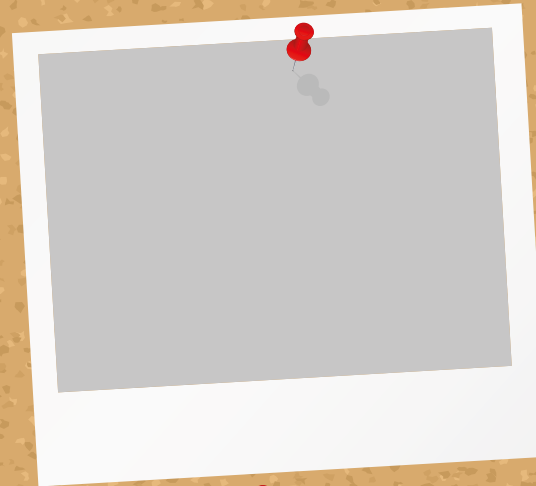
Key Skills for Term 4

Get 'Hands on!'

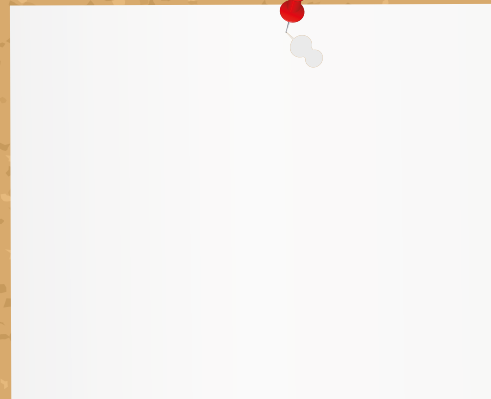
Key Skills for Term 5

Get 'Hands on!'

Key Skills for Term 6



Get 'Hands on!'





Pearson

Year 9

Term 1

Key Skills for Term 1

- Calculate and estimate combinations of powers, roots, fractions and brackets.
- Use index laws to simplify expressions.
- Write large and small numbers using standard form.
- Write and solve equations.
- Substitute values into expressions and formulae.
- Expand single and double brackets.



Mastery

Understand the effect of the sign of a power changes the sign of the answer (i.e even powers of a negative number give a positive answer; odd powers of a negative number give a negative answer).

Understand when to insert square brackets and when to insert round brackets in a calculation.

Develop understanding of roots and powers from squares and cubes to powers of 4, and 4th root etc. for integers and fractions (positive and negative).

Understand how the rules of indices can be extended to negative powers of products.

Understand how to calculate numbers in standard form, e.g. add or subtract two numbers in standard form, or multiply or divide two numbers in standard form.

Understand when to give solutions as a fraction or as a decimal.

When solving equations, understand that it does not matter which side you 'move' the unknowns too, but if you subtract the smaller term from each side this may often be easier (fewer negatives).

Intervention

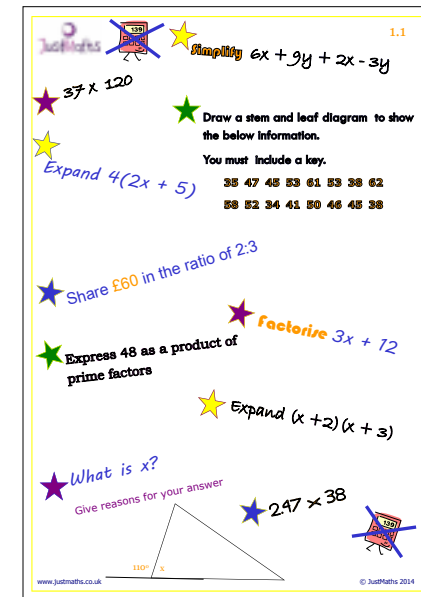
These Escape Room activities allow teachers to assess student understanding across the key skills that have been identified for each term.

[Click here for Year 9 Escape Rooms](#)

Starters Term 1

Routine & repetition is the key as you approach key stage 4, these widely available resources will allow students to practice the key skills every lesson in short, achievable sections. Aim for one each lesson:

- 'Corbett maths' 5-a-day starter
- 'Just Maths' – Bread and butter starter



- 'Mathsbot' – fluent calculations (you can allow hints)
- 'Just Maths' – a little every day calendars



Year 9

Term 2

Key Skills for Term 2

- Plan and design a survey using data collection sheets, tables and questionnaires.
- Calculate averages.
- Display, analyse and compare data.
- Enlarge 2D shapes using positive, negative and fractional scale factors.
- Calculate percentage change.
- Solve problems involving inverse proportion.

Mastery

Understand that 'closed' questions eg with tick boxes make questionnaires easier for people to complete and so saves time recording and organising data.

Calculate a mean using an assumed mean - and understand when this is more efficient.

Understand that it is best to draw a line of best fit to predict values from a scatter diagram, and that the closer the points on a scatter diagram are to the line of best fit (ie the stronger the correlation), the more accurate the predictions will be.

Understand how for a given set of data, different types of graph (scatter diagram, pie chart, dual bar chart, line graph, stem and leaf including back to back) or different types of table may highlight different features of the data or may better facilitate comparison of data, i.e. begin to choose appropriate graphs to represent data.

Describe enlargements that involve negative and fractional scale factors (by finding the centre of enlargement)

Understand that a combined enlargement, involving positive/negative integers and/or fractional scale factors, can be described as a single enlargement or single transformation.

Apply the use of percentage change to a scenario where it is not a straightforward 'Work out the percentage loss/profits/increase/decrease' question.

Intervention

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Starters Term 2

Routine & repetition is the key as you approach key stage 4, these widely available resources will allow students to practice the key skills every lesson in short, achievable sections. Aim for one each lesson:

- 'Corbett maths' 5-a-day starter
- 'Just Maths' Bread and butter starter
- 'Mathsbot' – retrieval starter

The screenshot shows a web application titled 'Retrieval Starter' with a purple header. Below the header, there are four white boxes arranged in a 2x2 grid. Each box has a title: 'Last Lesson', 'Last Week', 'Last Month', and 'Last Year'. Each box contains a 'Random' button, a 'Search Keyword' input field, and a 'Difficulty' dropdown menu. The 'Last Lesson' box also has a 'New Questions' button in the top right corner.

- 'Jaggers Maths' – numeracy time starter

Year 9

Term 3

Key Skills for Term 3

- Use scales and accurate scale diagrams.
- Construct accurate triangles, nets and bisectors.
- Find and use the n th term of an arithmetic sequence.
- Recognise and continue non linear sequences.
- Represent inequalities on a number line and find integer values that satisfy an inequality.



Mastery

Understand why the construction methods for perpendicular and angle bisectors work by considering properties of intersecting circles, and that a circle is the locus of all points equidistant from a fixed point (without using the term locus).

Construct accurate angles of 45° , 30° , 60° based on known constructions of perpendicular bisector, angle bisector and equilateral triangle.

A sequence may contain more than one sequence. For example in a fractions sequence the numerators may follow one sequence and the denominators another. Or in a pattern sequence, black dots may follow one sequence and white dots another. You can find the n th terms for each sequence and combine them.

Discover/understand the relationship between the 2nd difference of a quadratic sequence and the coefficient of n^2 in the n th term.

You can solve linear inequalities by doing the same to both sides, but if you multiply or divide both sides by a negative number, this changes the direction of the inequality sign.

Intervention

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[Click here for Year 9 Escape Rooms](#)

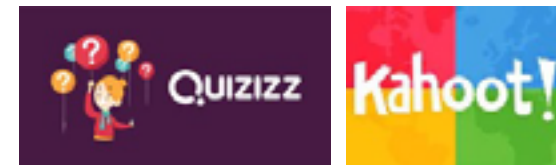
Starters Term 3

Routine & repetition is the key as you approach key stage 4, these widely available resources will allow students to practice the key skills every lesson in short, achievable sections. Aim for one each lesson:

- 'Just Maths' a little every day calendar
- 'Just Maths' Bread and butter starter
- 'Mathsbot' – numeracy time starter
- 'Jaggers Maths' – numeracy time starter



- Interactive resources can be found on Quizizz or Kahoot if students have access to devices. Use as a starter and plenary to check for lesson progress.



A photograph of two students, a young woman and a young man, sitting at a wooden desk in a classroom or library. The young woman, wearing a light blue denim shirt, is pointing at a document with a yellow pencil. The young man, wearing a black shirt, is looking at the document. On the desk are a laptop, a pen holder with several pens, and a document with a bar chart and a pie chart. The background shows wooden shelves.

Year 9

Term 4

Key Skills for Term 4

- Area and circumference of a circle.
- Use Pythagoras' Theorem to find unknown sides in a right angled triangle.
- Calculate volume and surface area of prisms and cylinders.
- Find the lower and upper bounds for a measurement.
- Calculate percentage error intervals.

Mastery

Understand that pi is an irrational number - it will not give an exact value. it is a ratio of the circumference to the diameter for any circle.

Solve problems involving arcs and sectors of circles.

Understand how to use Pythagoras's Theorem to show that a triangle is NOT a right angled triangle.

Understand why a cylinder is not a prism, but has similarities to properties of a prism.

Understand that as you increase the number of sides of a polygon that is the cross section of a prism, then you approach a cylinder.

Understand when a decimal value is not appropriate for an error bound or interval, and how this can change the inequality signs.

Intervention

These Escape Room activities allow teachers to assess student understanding across the key skills that have been identified for each term.

[Click here for Year 9 Escape Rooms](#)

Starters Term 4

Routine & repetition is the key as you approach key stage 4, these widely available resources will allow students to practice the key skills every lesson in short, achievable sections. Aim for one each lesson:

- 'Corbett maths' – 5 a day starter

15th January Foundation 5-a-day	
When $x = 5$ and $y = -7$ Find the value of $5xy$	
$\text{£}1 = \$1.5$ dollars Convert $\text{£}20$ into dollars	Convert $\$450$ into pounds
Adults $\text{£}4$ each Children $\text{£}3$ each A group of adults and children goes to the fair. The total cost is $\text{£}32$	Give a possible number of adults and children.
	Work out the size of the angle x .
2400 men and 600 women attend a rugby match. 30% of the people support Bath. $\frac{1}{4}$ of the men support Bath. What percentage of the women support Bath?	

- 'Just Maths' Bread and butter starter
- 'Mathsbot' – matching pairs starter
- 'Jaggers Maths' – numeracy time starter

Year 9

Term 5

Key Skills for Term 5

- Straight line graphs.
- Simultaneous equations.
- Non linear graphs.
- Congruent and similar shapes.
- Ratios in triangles.



Mastery

Write the equation of a line perpendicular to another line and understanding the relationship between the gradients of perpendicular lines.

Find the equation of a line between two points.

Understand that a pair of linear simultaneous equations has either no solutions, one solution or infinitely many solutions.

Understand that simultaneous equations may not both be linear, eg could be linear/quadratic, and therefore could have more than one solution.

Draw cubic graphs, recognise their features and distinguish between them and linear or quadratic graphs.

Identify where shapes are similar, congruent or neither, when descriptions only (NO DIAGRAMS) are given.

Solve problems involving similar shapes, other than triangles.

Intervention

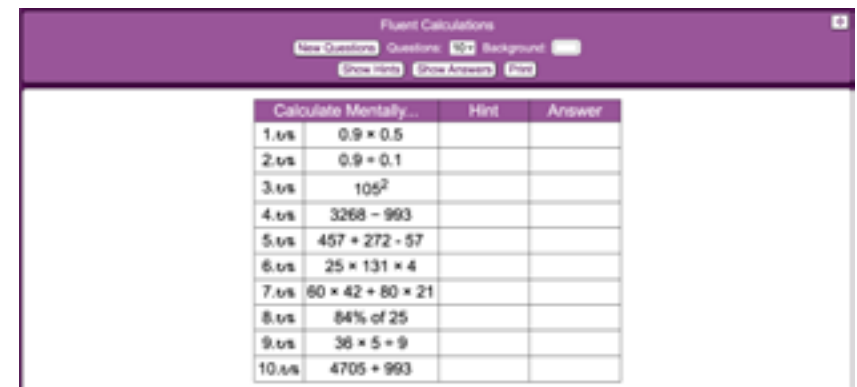
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Starters Term 5

Routine & repetition is the key as you approach key stage 4. These widely available resources will allow students to practice the key skills every lesson in short, achievable sections. Aim for one each lesson:

- 'Mathsbot' – fluent calculation starter (don't allow hints now)



	Calculate Mentally...	Hint	Answer
1.1/s	0.9×0.5		
2.1/s	$0.9 \div 0.1$		
3.1/s	105^2		
4.1/s	$3268 - 993$		
5.1/s	$457 + 272 \div 57$		
6.1/s	$25 \times 131 \times 4$		
7.1/s	$60 \times 42 \div 80 \times 21$		
8.1/s	84% of 25		
9.1/s	$36 \times 5 \div 9$		
10.1/s	$4705 \div 993$		

- 'Just Maths' – a little every day calendar
- 'Corbett maths' 5-a-day starter.
- Interactive resources can be found on Quiziz or Kahoot if students have access to devices. Use as a starter and plenary to check for lesson progress.



Year 9

Term 6

Key Skills for Term 6

- Identify and work out the probabilities of mutually exclusive outcomes and events.
- Calculate estimates of probability from experiments.
- Complete and calculate probabilities from two way tables, sample space diagrams and Venn diagrams.
- Identify the tangent, sine and cosine ratio of any angle.
- Use trigonometric ratios to work out an unknown angle in a right-angled triangle.

Mastery

Understand the importance of knowing whether events are mutually exclusive before attempting to work out $P(A \text{ or } B)$.

Understand that a 'fair' dice, spinner, etc will not have exactly the same experimental probability as theoretical probability.

Understand that Venn diagrams represent sets of data that are not mutually exclusive, and allow us to calculate probability of $P(A \text{ and } B)$ when A and B are not mutually exclusive. Begin to understand that when A and B are not mutually exclusive, $P(A) + P(B)$ counts the intersection of A and B twice.

Understand how to use the tangent ratio and Pythagoras to find lengths of all sides of a right angled triangle.

Understand that given an angle and the opposite side in a right-angled triangle, it is possible to use $\tan$ to find the adjacent side and then Pythagoras to find the hypotenuse. However, it is more efficient to use the sine ratio.

Use the tangent or sine ratio to find lengths in shapes made up of right angled triangles.

Understand bearings and use trigonometry to solve bearing problems.

Use trigonometry to find missing lengths and angles in cubes and cuboids.

Intervention

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[Click here for Year 9 Escape Rooms](#)

Starters Term 6

Routine & repetition is the key as you approach key stage 4, these widely available resources will allow students to practice the key skills every lesson in short, achievable sections. Aim for one each lesson:

- Download your own 'retrieval starter' template
- 'Jaggers Maths' – retrieval starter



The image shows a screenshot of a 'Retrieval Starter' template. It has a purple header with the title 'Retrieval Starter' and a 'New Questions' button. Below the header, there are four white boxes arranged in a 2x2 grid. Each box has a title: 'Last Lesson', 'Last Week', 'Last Month', and 'Last Year'. Each box contains a 'Random' dropdown menu, a 'Search Keyword' input field, and a 'Difficulty' dropdown menu.

- 'Corbett maths' 5-a-day starter. Start to think about 'levelling' up the if you haven't already, i.e. from Foundation to Foundation Plus etc.
- Can students write their own retrieval questions on a blank template to swap with a partner?

Engagement, Enjoyment + Manipulatives

Having a 'hands on' approach to their learning not only makes the activity fun, but it also can also promote a development of understanding and questioning that textbooks and worksheets can miss. These are a few ideas to help introduce a practical element to the year 9 key skills:

- Tarsia Puzzles: A fun way for students to practice a skill is to use a tarsia: Mr Barton Maths' has plenty to download.
- Maths Relay: A great 'outside' lesson (weather permitting). A quick search will produce many topics already compiled.
- Kahoot and Quizizz will always be popular if students have access to devices or are in a computer room. They are also a great way to track progress if you use as a starter and plenary.
- Multi-link cubes and 3D shapes are very useful particularly for volume and surface area.
- Household items such as tins are fantastic for students to identify the ratio between the circumference and diameter. Students can measure the lengths to discover pi themselves.



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