



Autumn Learning Journey for Maths

Year 11F Unit 1 Right-angled Triangles



How does this unit link to prior learning?			
- Angles in triangles - Rounding - Squares and roots - Solving equations			
Prior Knowledge Check			
1) What do the angles add up to in a triangle?			
2) Round the following numbers			
a) 3.675 (2dp) b) 54.693 (1dp) c) 7.9632 (3sf) d) 75245 (2sf)			
3) Calculate:			
a) $3^2 + 5^2$ b) $\sqrt{3^2 + 4^2}$ c) $\sqrt{10^2 + 12^2}$			
4) Solve:			
a) $3 = \frac{x}{10}$ b) $2 = \frac{x}{12}$ c) $5 = \frac{20}{x}$			
What will you be learning about?		How does this link to the wider curriculum?	
To use Pythagoras' Theorem and trigonometry to solve problems to do with right-angled triangles.		The five British values are embedded in maths lessons through collaborative problem-solving, mutually respecting discussions of different methods, following classroom rules, making independent choices and appreciating diverse perspectives and contributions.	
We will develop our learning each week by focusing on:			
1) Pythagoras Theorem		RAG	2) Using Pythagoras Theorem to find a shorter side
- Understand Pythagoras' theorem. - Calculate the length of the hypotenuse in a right-angled triangle. - Solve problems using Pythagoras' theorem.			- Calculate the length of a line segment AB. - Calculate the length of a shorter side in a right-angled triangle.
3) Trigonometry: the sine ratio 1			4) Trigonometry: the sine ratio 2
- Understand and recall the sine ratio in right-angled triangles. - Use the sine ratio to calculate the length of a side in a right-angled triangle. - Use the sine ratio to solve problems.			- Use the sine ratio to calculate an angle in a right-angled triangle. - Use the sine ratio to solve problems.

5) Trigonometry: the cosine ratio - Understand and recall the cosine ratio in right-angled triangles. - Use the cosine ratio to calculate the length of a side in a right-angled triangle. - Use the cosine ratio to calculate an angle in a right-angled triangle. - Use the cosine ratio to solve problems.			6) Trigonometry: the tangent ratio - Understand and recall the tangent ratio in right-angled triangles. - Use the tangent ratio to calculate the length of a side in a right-angled triangle - Use the tangent ratio to calculate an angle in a right-angled triangle. - Solve problems using an angle of elevation or depression.			
7. Finding lengths and angles using trigonometry - Understand and recall trigonometric ratios in right-angled triangles. - Use trigonometric ratios to solve problems. - Know the exact values of the sine, cosine and tangent of some angles.			8. Revision Lesson - Select topics you feel the class need to revise. - Classroom based or Mathswatch.			
9. Assessment Lesson (non-calculator) - Do 10-minute top up and go through answers together, students self-assess. - Open book assessment done in silence.			10. Feedback Lesson - Student to highlight their traffic light sheet. - Teacher to go through test and students to self-assess in green. - Students to complete the NOW section of the WOW-HOW-NOW sheet.			
Key Vocabulary						
Triangle	Sine	Cosine	Tangent	Hypotenuse	Elevation	Adjacent

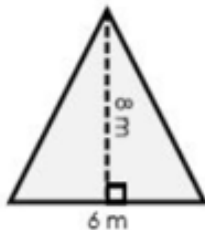
How will this help you in the future?
Pythagoras' theorem and trigonometry are useful in adult life because they help people calculate distances, heights, angles, and relationships between objects. These skills are used in everyday situations like measuring spaces for building or renovating, navigation and map reading, and understanding slopes, ramps, and angles. They allow adults to solve real-world problems accurately instead of guessing. Many jobs rely on these skills, including engineers, architects, carpenters, electricians, surveyors, construction workers, pilots, sailors, game designers, and data or computer engineers. They are also important in science, medicine (such as medical imaging), and technology fields where precise measurements and calculations are required.



Autumn Learning Journey for Maths

Year 11F Unit 2 Perimeter, area and volume 2

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How does this unit link to prior learning?			
• Area and perimeter of rectangles • Circle properties • Area of triangles			
Prior Knowledge Check			
1. Calculate the perimeter and area of this rectangle: 5m  8m 2. Write a definition for the radius of a circle.  3. Find the area of a triangle shown.			
What will you be learning about?	How does this link to the wider curriculum?		
• Calculate the circumference, area, radius or diameter of a circle. • Find the area of semicircles and sectors. • Find the surface area and volume of 3D solids.	• The five British values are embedded in maths lessons through collaborative problem-solving, mutually respecting discussions of different methods, following classroom rules, making independent choices and appreciating diverse perspectives and contributions.		
We will develop our learning each week by focusing on:			
1. Circumference of a circle 1 • Calculate the circumference of a circle. • Solve problems involving the circumference of a circle.	RAG	2. Circumference of a circle 2 • Calculate the circumference and radius of a circle. • Work out percentage error intervals.	RAG
3. Area of a circle • Work out the area of a circle. • Work out the radius or diameter of a circle. • Solve problems involving the area of a circle. • Give answers in terms of π.		4. Semicircles and sectors • Understand and use maths language for circles and perimeters. • Work out areas of semicircles and quarter circle and perimeters. • Solve problems involving sectors of circles.	
5. Compound Shapes • Solve problems involving areas and perimeters of 2D shapes.		6. Volume of Cylinders • Work out the volume of cylinders.	

7. Surface Area of Cylinders Work out the surface area of cylinders.			8. Volume of cones and pyramids. Work out the volume of cones and pyramids.			
9. Surface area of cones Work out the surface area of cones.			10. Surface area of pyramids. Work out the surface area of pyramids.			
11. Volume of a sphere Work out the volume of a sphere.			12. Surface area of a sphere Work out the surface area of a sphere.			
13. Composite Solids Work out the volume and surface area of composite solids.			14. Revision Lesson - Select topics you feel the class need to revise. - Classroom based or Mathswatch.			
15. Assessment Lesson (non-calculator) - Do 10-minute top up and go through answers together, students self-assess. - Open book assessment done in silence.			16. Feedback Lesson - Student to highlight their traffic light sheet. - Teacher to go through test and students to self-assess in green. - Students to complete the NOW section of the WOW-HOW-NOW sheet.			
Key Vocabulary						
Circumference	Area	Radius	Pyramid	Cone	Substitute	Formulae

How will this help you in the future?
Perimeter, area, and volume are useful in adult life because they help people measure space, size, and capacity accurately. These skills are used in everyday tasks such as calculating how much fencing, paint, carpet, or tiles are needed, comparing sizes of rooms or land, and working out how much a container can hold. They help adults plan efficiently, reduce waste, and manage costs. Many jobs require these skills, including architects, builders, landscapers, interior designers, engineers, quantity surveyors, warehouse managers, packaging designers, chefs, and manufacturing workers. They are also important in logistics, healthcare, and science, where measuring space and capacity correctly is essential.



Spring Learning Journey for Maths

Year 11F Unit 3 More Algebra



How does this unit link to prior learning?

- Linear Graphs
- Coordinates
- Substitution

Prior Knowledge Check

1) Describe the shape of the following types of graphs:

a) linear graph

b) Quadratic graphs

2) What is the reciprocal of 5?

3) If $a = 4$ and $b = -3$, what is the value of $a + 3b$?

4) In $y = mx + c$, what does the m and the c tell you about the line?

What will you be learning about?

- Draw and interpret non-linear graphs.
- Solve simultaneous equations using a graph and algebraically.
- Rearrange formulae.

How does this link to the wider curriculum?

- The five British values are embedded in maths lessons through collaborative problem-solving, mutually respecting discussions of different methods, following classroom rules, making independent choices and appreciating diverse perspectives and contributions.

We will develop our learning each week by focusing on:

1. Linear Graphs

- Plot a straight-line graph

RAG

2. Quadratic Graphs

- Plot a quadratic graph

RAG

3. Quadratic Graphs Plot a cubic and reciprocal graph.			4. Simultaneous Equations Solve simultaneous equations algebraically.			
5. Simultaneous Equations Graphically - Solve simultaneous equations by drawing a graph. - Write and solve simultaneous equations.			6. Rearranging formulae Change the subject of a formula.			
7. Proof - Identify expressions, equations, formulae and identities. - Prove results using algebra.			8. Revision Lesson - Select topics you feel the class need to revise. - Classroom based or Mathswatch.			
9. Assessment Lesson - Do 10-minute top up and go through answers together, students self-assess. - Open book assessment done in silence.			10. Feedback Lesson - Student to highlight their traffic light sheet. - Teacher to go through test and students to self-assess in green. - Students to complete the NOW section of the WOW-HOW-NOW sheet.			
Key Vocabulary						
Reciprocal	Linear	Quadratic	Simultaneous	Subject	Rearrange	Elimination

How will this help you in the future?
Algebraic graphs are useful because they show relationships between numbers in a clear, visual way. Instead of only working with equations, graphs help people see patterns, trends, and changes, which makes problem-solving easier and faster. In later life, this skill helps with understanding real-world situations such as budgeting, tracking growth or decline, comparing options, and predicting outcomes. Many jobs rely on algebraic graphs. Engineers use them to design structures and systems and to understand how different variables affect performance. Scientists and researchers use graphs to analyse data and show results clearly. Economists and business analysts use graphs to study profits, costs, and market trends. Computer programmers and game designers use graphs to model movement, speed, and changes over time. Even careers in healthcare, such as medical research or epidemiology, use graphs to track patient data and disease trends. Overall, learning algebraic graphs builds logical thinking and data-interpretation skills that are valuable in everyday life and across many careers, especially those involving technology, science, and decision-making.



Spring Learning Journey for Maths

Year 11F Unit 4 Constructions, Loci and Bearings

How does this unit link to prior learning?			
- Names of polygons - Properties of triangles - Angles in parallel lines			
Prior Knowledge Check			
1. What is the name of a shape with 6 sides? 2. Write down 2 properties of an isosceles triangle. 3. Complete the sentences using one of these phrases: <i>are equal</i> <i>add up to 180°</i> a) Corresponding angles _____. b) Angles on a straight line _____. c) Alternate angles _____.			
What will you be learning about?		How does this link to the wider curriculum?	
Accurate construction of shapes and diagrams including their use to model and solve problems.		- The five British values are embedded in maths lessons through collaborative problem-solving, mutually respecting discussions of different methods, following classroom rules, making independent choices and appreciating diverse perspectives and contributions.	
We will develop our learning each week by focusing on:			
1. 3D solids - Recognise 3D shapes and their properties. - Describe 3D shapes using the correct mathematical words. - Understand the 2D shapes that make up 3D objects.	RAG	2. Plans and elevations - Identify and sketch planes of symmetry of 3D shapes. - Understand and draw plans and elevations of 3D shapes. - Sketch 3D shapes based on their plans and elevations.	RAG
3. Accurate drawings 1 Make accurate drawings of triangles using a ruler, protractor and compasses.		4. Congruent Triangles - Identify SSS, ASA, SAS and RHS triangles as unique from a given description. - Identify congruent triangles	

5. Scale drawings and maps • Draw diagrams to scale. • Correctly interpret scales in real-life contexts. • Use scales on maps and diagrams to work out lengths and distances. • Know when to use exact measurements and estimations on scale drawings and maps. • Draw lengths and distances correctly on given scale drawings.		6. Accurate drawings 2 • Accurately draw angles and 2D shapes using a ruler, protractor and compasses. • Construct a polygon inside a circle. • Recognise nets and make accurate drawings of nets of common 3D objects.				
7. Constructions • Draw accurately using rulers and compasses. • Bisect angles and lines using rulers and compasses.		8. Loci and regions • Draw loci for the path of points that follow a given rule. • Identify regions bounded by loci to solve practical problems.				
9. Bearings • Find and use three-figure bearings. • Use angles at parallel lines to work out bearings.		10. Problems with bearings • Solve problems involving bearings and scale diagrams.				
11. Revision Lesson • Select topics you feel the class need to revise. • Classroom based or Mathswatch.		12. Assessment Lesson (non-calculator) • Do 10-minute top up and go through answers together, students self-assess. • Open book assessment done in silence.				
13. Feedback Lesson • Student to highlight their traffic light sheet. • Teacher to go through test and students to self-assess in green. • Students to complete the NOW section of the WOW-HOW-NOW sheet.						
Key Vocabulary						
Plan	Elevation	Accuracy	Scale	Region	Loci	Plane

How will this help you in the future?
Loci, bearings, and constructions are useful in adult life because they help people understand location, direction, and accurate design. These skills are used in navigation, map reading, planning routes, and setting out precise shapes or layouts. They are especially helpful when determining the exact position of something based on distance or direction, and when creating accurate plans or designs. Many jobs rely on these skills, including surveyors, architects, engineers, pilots, sailors, air-traffic controllers, town planners, cartographers, construction workers, and landscape designers. They are also important in the military, emergency services, and GPS and mapping technology fields.



Spring Learning Journey for Maths

Year 11F Unit 5 – Fractions, Indices and Standard Form

How does this unit link to prior learning?

- Mixed numbers and improper fractions
- Writing as a power of 10
- Square numbers

Prior Knowledge Check

1. Write $\frac{26}{8}$ as a mixed number.
2. Write 10,000 as a power of 10 (e.g. 100 would be 10^2)
3. Write down the value of 6^2
4. Write down the value of 2^4

What will you be learning about?

- Multiply and divide mixed numbers and fractions.
- Use the laws of indices.
- Use and understand standard form.

How does this link to the wider curriculum?

- The five British values are embedded in maths lessons through collaborative problem-solving, mutually respecting discussions of different methods, following classroom rules, making independent choices and appreciating diverse perspectives and contributions.

We will develop our learning each week by focusing on:

1. Multiplying Fractions • Multiply fractions and mixed numbers.	RAG	2. Dividing Fractions • Divide fractions and mixed numbers.	RAG
3. The laws of indices • To know and use the laws of indices.		4. Writing large numbers in standard form • Write large numbers in standard form. • Convert large numbers from standard form into ordinary numbers.	

5. Writing small numbers in standard form • Write small numbers in standard form. • Convert numbers from standard form with negative powers of ordinary numbers		6. Calculating with standard form • To multiply and divide numbers in standard form.				
7. Calculating with standard form • To add and subtract numbers in standard form.		8. Revision Lesson • Select topics you feel the class need to revise. • Classroom based or Mathswatch.				
9. Assessment Lesson • Do 10-minute top up and go through answers together, students self-assess. • Open book assessment done in silence.		10. Feedback Lesson • Student to highlight their traffic light sheet. • Teacher to go through test and students to self-assess in green. • Students to complete the NOW section of the WOW-HOW-NOW sheet.				
Key Vocabulary						
Multiply	Divide	Improper	Mixed Number	Indices	Power	Ordinary

How will this help you in the future?
Fractions and standard form are important because they help people work accurately with numbers in real-life situations. Fractions are used whenever something needs to be shared, measured, or compared, such as dividing money, adjusting recipes, measuring materials, or understanding discounts and probabilities. Being confident with fractions makes every day problem-solving quicker and helps avoid mistakes. Standard form is useful for working with very large or very small numbers in a clear and manageable way. It is especially important in science and technology, where numbers like distances in space, tiny measurements, or large data values are common. Standard form makes calculations easier and helps people understand the scale of numbers. Many jobs use fractions and standard form. Chefs, builders, and engineers use fractions to measure ingredients and materials accurately. Accountants, shop managers, and tradespeople use fractions when working with money, prices, and percentages. Scientists, engineers, doctors, and technicians use standard form when dealing with measurements, calculations, and data. Careers in physics, astronomy, computer science, and engineering rely heavily on standard form. Overall, fractions and standard form develop strong number skills that are essential for everyday life and are widely used in practical and professional careers.



Spring Learning Journey for Maths

Year 11F Unit 6 – Congruence, Similarity and Vectors

How does this unit link to prior learning?

- Fraction of amount
- Powers
- Negative numbers
- Scale factors

Prior Knowledge Check

1. Work out $\frac{2}{3}$ of 60.

2. Calculate:

a) 4^3 b) 0.5^2 c) $-3 - 5$ d) $9 - -2$

3. Describe what applying scale factor 3 does to a shape:

What will you be learning about?

- Understand and use similarity to find angles and find scale factors of enlargements.
- Understand and use congruence to identify congruent shapes, find angles and find side lengths.
- Work with vectors: add and subtract vectors, find the resultant and multiples of a vector.

How does this link to the wider curriculum?

- The five British values are embedded in maths lessons through collaborative problem-solving, mutually respecting discussions of different methods, following classroom rules, making independent choices and appreciating diverse perspectives and contributions.

We will develop our learning each week by focusing on:

1. Similarity and enlargement • Understand similarity. • Use similarity to solve angle problems.	RAG	2. More similarity • Find the scale factor of an enlargement. • Use similarity to solve problems.	RAG
3. Using similarity • Understand the similarity of regular polygons. • Calculate perimeters of similar shapes.		4. Congruence • Recognise congruent shapes. • Use congruence to work out unknown angles.	
5. Congruency to find missing sides. • Use congruence to work out unknown sides.		6. Vectors • Add and subtract vectors. • Find the resultant of two vectors.	

7. Vectors with arithmetic - Subtract vectors. - Find multiples of a vector.				8. Revision Lesson - Select topics you feel the class need to revise. - Classroom based or Mathswatch.			
9. Assessment Lesson - Do 10-minute top up and go through answers together, students self-assess. - Open book assessment done in silence.				10. Feedback Lesson - Student to highlight their traffic light sheet. - Teacher to go through test and students to self-assess in green. - Students to complete the NOW section of the WOW-HOW-NOW sheet.			
Key Vocabulary							
Similar	Congruent	Vector	Resultant	Multiple	Shape	Scale	

How will this help you in the future?
Similar shapes and congruency are important because they help people understand size, scale, and accuracy. Similar shapes have the same shape but different sizes, which is useful for working with scale drawings, maps, and models. Congruent shapes are the same size and shape, which helps ensure precision and consistency. These ideas improve spatial awareness and problem-solving skills that are useful in everyday life. Many jobs use similar shapes and congruency. Architects and builders use similar shapes to create scale plans and models, and congruency to make sure parts fit together correctly. Engineers and manufacturers rely on congruent shapes, so components are identical and work safely. Designers and artists use similar shapes to resize images and designs without changing their proportions. Surveyors and cartographers use similar shapes when creating accurate maps. In technology and gaming, developers use these concepts to scale objects and create consistent designs. Overall, learning about similar shapes and congruency helps develop accuracy, visual reasoning, and practical measurement skills that are valuable in daily life and in many careers involving design, construction, engineering, and technology.