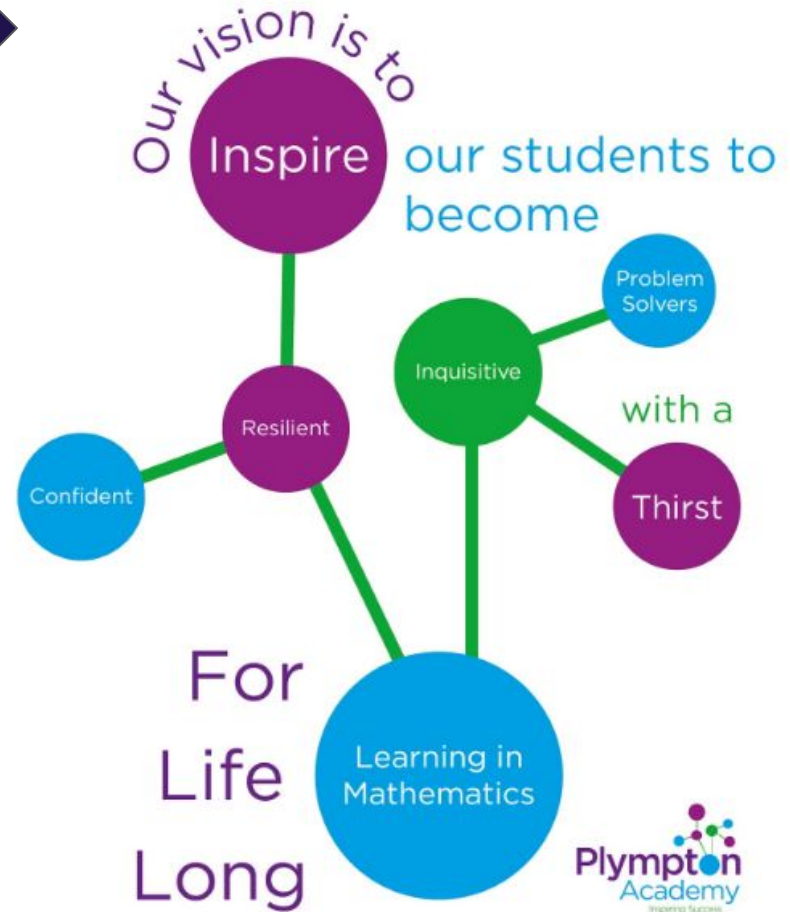


Mathematics

at Plympton

Academy



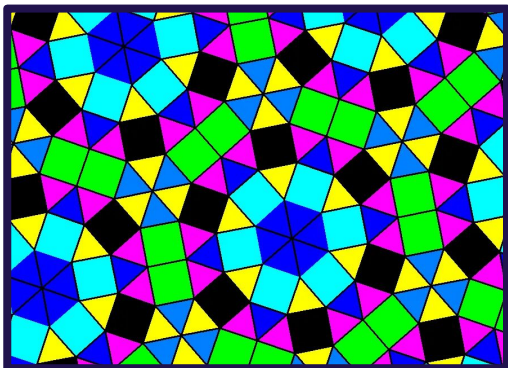
Learning Journey

Our curriculum is a 5 and 7 year curriculum to support all our pupils to become **lifelong**

learners in Mathematics and gain excellent qualifications at both GCSE and Post-16 qualifications. Building on the key stage 2 curriculum we explore the 6 big ideas of Mathematics.

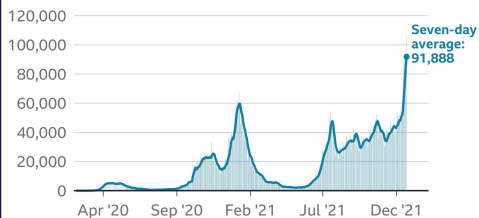
- Number
- Ratio & Proportion
- Algebra
- Geometry
- Data Analysis
- Probability

Students explore these big ideas and understand the relationships that connect them. Recognising that Mathematics is a language is key to this exploration and starts with being **inquisitive** and asking thought provoking questions. Students develop their mathematical curiosity by regularly considering what they already know and asking challenging questions about what they observe in situations from geometrical patterns like tessellations to exploring real life data. This manifests itself as a **thirst** for exploring and explaining the world through the language of Mathematics.



Case numbers rising

Daily confirmed coronavirus cases by date reported



Note: Testing not readily available in first months of the pandemic. Lateral flow tests became widely used in spring 2021

Source: Gov.uk dashboard, updated 22 Dec



Expert Teaching

Our team of expert subject specialists use a range of engaging techniques to develop

our pupil's **inquisitive** nature **confidence** and **resilience**. Examples are;

Circle Maps - new topics are linked to previous learning and here we ask new questions

Modelling - New topics are always expertly modelled (Teacher Model) and pupils are supported to replicate these (Student Model)

Deliberate Practice - Pupils have opportunities to master a fluent technique in each new skill

Oral Rehearsal - using techniques known as 'Think, Pair, Share' pupils express their understanding and justify their conclusions to others

Pivot Questions and Exit Tickets - Pupils test their new knowledge against unseen questions. Learning only moves on when confidence is demonstrated.

Digging Deeper - looks at problems that develop strategy, creativity, critical evaluation, justification and proof.

Deliberate Practice

Generate the first six terms of the sequences with the following term-to-term rules:

- | | |
|---------------------------------|--|
| (a) First term 1, add 3 | (g) First term 24, multiply by 2 |
| (b) First term 5, add 3 | (h) First term 24, divide by 2 |
| (c) First term 5, add 4 | (i) First term 2048, divide by 2 |
| (d) First term 6, subtract 4 | (j) First term 2048, divide by 4 |
| (e) First term 6, subtract 1 | (k) First term 625, multiply $\frac{1}{5}$ |
| (f) First term 6, multiply by 2 | (l) First term 1, add $\frac{1}{5}$ |



Generating Sequences Tick List

Write the first term, as given in the question

Follow the rule to find the next term

Apply the rule again to find the next term

Pivot Question

First term: **4**

Term-to-term rule: **Add 10**

Generate the next 5 terms of the sequence

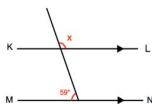


Sequences Exit Ticket

Name:

- 15, 18, 21, 24, 27, ...
 - Identify the first term
 - Describe the term-to-term rule
 - Find the next three terms
- Find the 100th term in the sequence $7n + 4$
- Find the n th term rule of the sequence: 3, 8, 13, 18, 23, ...

Interleaved Questions



- Work out the size of the angle marked x .



Building Confidence

Formula

Area $A = \pi r^2$

Circumference $C = 2\pi r$

Circle

Teacher Model	Student Model
Calculate the area of the circle. Leave your answer in terms of pi.	Calculate the area of the circle. Leave your answer in terms of pi.
	Write down both the radius and diameter of the circle
	Write down the formula for the area of a circle
	Substitute the value of r into the formula
	Calculate the area and leave the answer as a multiple of Pi

Digging Deeper

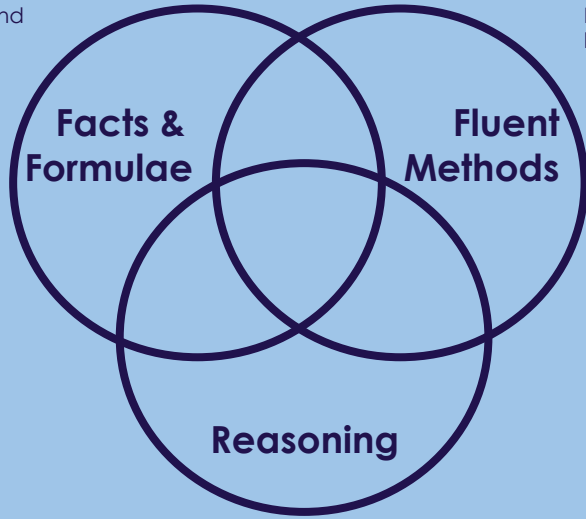
The diagram shows a circle inside a square. The square has a side length of 8cm.

Work out the area of the shaded region correct to the nearest 0.1cm².

Our students are most successful when they are **confident** in the three key aspects of Mathematical techniques

Key facts are regularly taught and retrieved throughout the curriculum using techniques like

- Starter for Ten
- Knowledge Organisers
- Weekly homework
- Show Me Boards
- Cold Calling



Fluency in methods is supported by

- Expert modelling
- Scaffolded practice
- Deliberate practice
- Recall opportunities
- Interleaving
- Regular homework tasks

Our students regularly get to explore the relationships between concepts, explore a range of problem solving strategies and explain or justify the relationships observed.

Building Confidence



Our focus on timely and incisive feedback also grows **confidence** and fluency. Pupils receive ongoing feedback through a range of methods exemplified below,

- Live Marking - Teachers review pupils work and offer a mixture of verbal and written feedback often focused deliberate practice and pivot question tasks.
- Whole Class Feedback - As teachers review classwork they identify misconceptions and support the whole class in response.
- Show Me Board activities - Pupils regularly engage in show me board activities leading to whole class feedback.
- Exit Tickets - These mini-assessments are marked by the teachers and returned with feedback to pupils on a regular basis.
- Assessment Feedback - all summative assessments are marked and returned to pupils highlighting both strengths and gaps in knowledge and understanding. Students are guided to resources to support their own gaps.

Mathematics Assessment Feedback
 Paper June 2018 Paper 1F
 Name 11w/Mad 21/22
 Teacher

Questions	Question Title	Score	Clip Number
1	Round numbers to the nearest 1000	1 / 1	17
2a	Compare negative numbers	1 / 1	37
2b	Compare decimal numbers	1 / 1	46
3	Convert percentages to fractions	1 / 1	82
4	Equivalent fractions	1 / 1	59
5	Odd and even numbers, multiples	1 / 1	25, 33
6a	Simplifying expressions involving multiplication	1 / 1	158
6b	Collecting like terms	0 / 1	156
7a	Express a probability in words	1 / 1	349
7b	Express a probability in words	1 / 1	349
7c	Probability of single events, simplify fractions	3 / 3	351, 61
8	Direct proportion	2 / 2	341
9a	Parts of a circle	0 / 1	592
9b	Parts of a circle	1 / 1	592
10	Money	3 / 3	749
11a	Factors of a number, odd and even numbers	0 / 1	27, 25
11b	Odd and even numbers	0 / 1	25
12a	Composite bar charts	1 / 1	425
12b	Composite bar charts	2 / 3	425
12c	Composite bar charts	1 / 2	425
12d	Composite bar charts	0 / 1	425
13	Subtraction, division worded problem	3 / 3	20, 22
14	Convert percentages & fractions to decimals, compare decimals	0 / 4	83, 73, 330, 46
15	Percentage of an amount	0 / 2	85

Building Resilience

Describing Sequences



What do you want to ask?

3, 6, 9, 12, 15, ...

What do you notice?

4, 7, 10, 13, 16, ...

1, 3, 5, 7, ...

What do you notice about each of the sequences?



5, 10, 15, 20, ...

Can you work out the next term in the sequence?

Digging Deeper



$$\frac{1}{12}, \frac{5}{24}, \frac{1}{3}, \dots$$

Use a grid to draw a diagram that could represent this sequence.

What would be the next term?

Is $\frac{1}{4}$ a term in this sequence? Why?/Why not?

Will $2\frac{1}{2}$ be a term in the sequence? Explain your answer.

What else can you find out?

Our students develop mathematical **resilience** by first being **confident** with their recall of key facts and formulae and being given opportunities to apply these.

Secondly we create safe environments where students are encouraged to explore or explain their own ideas without the fear of failure. We re-define 'wrong answers' as a natural and essential part of the learning journey

Finally pupils apply their understanding to unfamiliar situations and share their ideas and conclusions. These skills are the essential qualities of develop pupils into successful **problem solvers** using activities like;

- Think Pair Share - Oral activities to support oracy **confidence**
- Circle Maps - Identify what you know and would like to know
- Digging Deeper - Applying basic ideas in advanced scenarios

Thirst and Passion



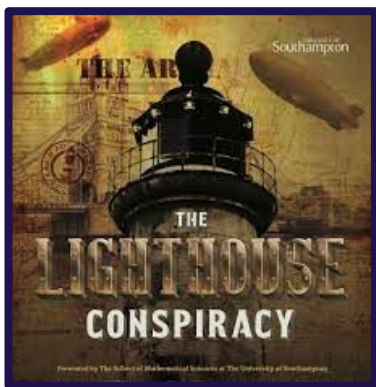
United Kingdom
Mathematics Trust

Pupils are not limited to Mathematics in just their Maths lessons. We work hard to ensure that strong cross curricular links are made with other facilitating subjects such as Science, Psychology and Engineering as just 3 examples.

Pupils are also encouraged to engage in National competitions with the UKMT individual and team competitions. Other extra curricular opportunities are available including but not limited to

- Chess Club
- UKMT Club
- Post 16 Maths Club
- National Cipher Challenge
- Homework support

Students are also supported after school for additional exam technique support and revision before external summative exams.



Lifelong Mathematics Learning



We believe everyone should continue to develop their love and passion for Mathematics. That starts with our expert teachers who regularly engage in Professional development to ensure they are always modelling to our students our love, enthusiasm and drive to engage in our passion for Mathematics.



We provide a wide range of Post-16 opportunities to support our students continue their thirst for **life long learning in Mathematics**. We offer the following courses;

- A Level Mathematics
- A Level Further Mathematics
- Core Mathematics
- GCSE Resit courses
- Functional Skills in Mathematics