



Be all you can be
Hayes School

Maths at Hayes: Subject Story





Be all you can be
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The Hayes Curriculum Vision Statement

At Hayes, we strive for our children to push beyond any perceived idea of potential, to be all they can be, regardless of background. Our vision is for all of our children to leave us as good human beings- happy, kind and responsible. Our curriculum is integral in shaping the children to become independent and life-long learners. Our curriculum aims to equip our children with the ability to 'think' in order to make sense of an ever-changing world. The breadth our curriculum provides is underpinned by thinking. This thinking will allow our children to make sense of the world around them and before them in order that they can live fulfilling and happy lives, being all they can be.



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The Hayes Values

Our six values are embedded in all areas of school life and in our maths provision.

- **Responsibility:** At Hayes, in KS2 children are encouraged to take responsibility when marking their own work and correcting their errors. They use this responsibility to coach their peers. In KS1, children are expected to mark parts of their own learning through teacher-initiated feedback. In EYFS, opportunities are provided for children to extend and improve their learning by verbalising their understanding.
- **Success:** In maths at Hayes, opportunities have been developed to ensure that all children experience and celebrate success at different levels of maths. Lesson design includes sequences that have been broken into small steps to allow for successful progression.
- **Aspirations:** Our maths lessons include specific, explicit links to real life maths for children to apply in their own lives, outside of school. By raising the profile of maths through events such as Maths Story Day, no stone is left unturned to ensure that all children get the best possible foundations for lifelong maths learning.
- **Resilience:** Resilience is instilled in the children from the start of their maths learning, which encourages them to take risks and attempt challenges that require higher order skills. Feedback given by teachers through timely interventions ensures that children have opportunities to revisit and correct their misconceptions.
- **Discovery:** Each maths sequence includes explicit teaching to model, support and encourage problem solving and reasoning. Furthermore, children are presented with open ended, investigative challenges, which require them to apply their taught skills and knowledge in order to find an answer.
- **Friendship:** Our classrooms have a culture, where risk taking is crucial and celebrated and where children feel safe to explore the extent of their own knowledge. They ask questions, they articulate their thinking and they share their understanding within the classroom environment, often using their understanding to support their peers. Misconceptions are celebrated and used as a learning tool.



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Intent: Maths

At Hayes School, we aim to build enthusiastic, resilient mathematicians who are well-equipped to apply their mathematical skills across a wide range of contexts. The children should work hard progressing through a captivating and challenging maths curriculum.

The National Curriculum for Mathematics aims to ensure that all pupils:

- Become fluent in the fundamentals of mathematics so that they can develop their conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- Solve problems by applying their mathematics to a variety of problems, including breaking them down into a series of smaller steps, and persevering in seeking solutions.
- Reason mathematically, including being able to develop an argument, justification or proof using mathematical language.



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Intent: Maths

At Hayes School, maths is an integral part of the curriculum which enables children to use their skills widely. Whole school, days such as Number day, maths through stories and events, fundraisers all impact on children's conceptualization of maths in the wider world.





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Implementation: Maths (EYFS)

In our EYFS classes, there is a daily review of counting through chants, subitising games and traditional number rhymes. Each lesson within the maths journey provides an opportunity for children to develop their fluency and problem solving skills through a rich, mathematical environment. Our EYFS setting, provides opportunities for children to use their maths skills throughout the continuous provision. There is also a maths area, where children are able to explore a range of resources through play which is both adult and child-led. Modelling consistently includes a range of varied manipulatives and representations to support children in recognising the mathematical concept in a range of contexts. There is a strong emphasis on developing children's mathematical talk and reasoning. Routines in EYFS further embed children's number knowledge such as involving children in our daily calendar, registers, story time voting, bib system for outdoor learning.





Implementation: Maths across Y1-Y6

At Hayes School, we use the White Rose Scheme of Learning as a guide to teaching and learning, incorporating many of the principles of mastery maths. We have a school calculation policy, which has been created and adapted to reflect these mastery guides. Although this forms the basis of our maths planning, teachers have a flexible approach to planning the order of skills and extending the allocated time given to each block based on classroom assessments.

During whole class learning, we follow the mastery principles of fluency, varied fluency, reasoning and problem solving. At the planning stage, lessons are broken down into small, connected steps that gradually unfold the concept to ensure that coherence is evident across the stages of conceptualisation in differing contexts. Mathematical representation and structure is consistently modelled throughout the sequence using the concrete, pictorial and abstract approach to enable children to actively reason and discuss their understanding with a partner at regular intervals.

Best practice facilitates quick and efficient recall of facts, procedures and the flexibility to move between different contexts including problem solving and reasoning opportunities. Careful thought is given to how to best represent the concept being taught, often in more than one way, to draw attention to critical aspects, and to develop deep and holistic understanding. Based on careful AFL, children should begin their journey through the mastery flow system at a point and pace which is matched closely to their understanding until they reach higher order thinking.



Implementation: Maths across Y1-Y6

Differentiation is achieved through early and consistent AFL as Hayes teachers constantly assess children's prior knowledge to build upon. Differentiation is also seen through the varying degree of adult support provided, asking higher order questions and the use of concrete, pictorial and abstract resources. Pupils with the potential for greater depth are moved on quickly and provided with opportunities to utilise their skills in an investigative context. Pupils who are struggling to grasp a concept or procedure are identified quickly and placed in a guided, teacher-led group or conferenced at a later point in the day. For children who are not able to access their own year group's curriculum because of special educational needs will progress through a tailor made curriculum matched closely to their ISPs.

Within each lesson at Hayes, the session will begin with retrieval based around 'Flashback 4,' enabling children to revisit key learning. Following this, key concepts, concrete and pictorial representations are introduced to the children, first through a teacher explanation, then a paired problem before children apply their skills independently. Following this pupils access fluency (progressing through the CPA approach), reasoning and problem solving tasks, giving the children the chance to secure a deeper understanding of the concept. To promote inquiry-based mathematical thinking, the children are exposed to explicit reasoning and problem solving lessons in which the strategy to success is broken down into small steps and applied to wider contexts. Equally, children can take part in whole class fluency sessions where the skill is secured before moving on.

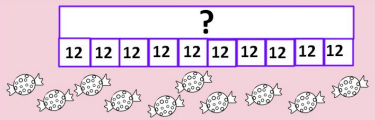


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Implementation: Maths Assessment

Across Y3-Y5, each unit starts with a 'Dive Deeper' which is a pre-assessment to identify gaps in pupils' prior knowledge, as well as their strengths. This looks closely at the pupil's ability to explain it, show it, draw it, prove it and contextualise it. This allows planning to be adjusted to meet pupils' and classes' individual needs.

In Y1, Y3, Y4 and Y5, children are given termly Headstart papers assessing their abilities in arithmetic and reasoning. In Y2 and Y6, children are given termly past SATs papers. Each child will have their paper analysed to understand where their individual gaps are in learning. Teachers will then work to close these gaps using a combination of careful planning, guided groups and interventions.

$12 \times 10 = 120$  Dive Deeper  $67.4 \times 10 = 674$																											
$345 \times 10 = 3450$	$68.3 \times 10 = 683$																										
Draw it																											
Explain it	When multiplying by 10, we focus on place value. Multiplying any number, increases the number. In this case, we increase it 10 times. When multiplying, we must move the digits to the left. When needed, we then add a 0 place holder. In decimals, it's not always needed.																										
Make a mistake	$12 \times 10 = 102$ When multiplying by 10 and crossing the 100 barrier, sometimes we mistake where the 0 should go. $12.3 \times 10 = 120.3$ When multiplying decimals by 10, sometimes you forget that we don't just add a 0 as place holder, but we need to move the digits by using our place value knowledge.																										
Tell a maths story	Mrs A buys 10 packs of purple pens. Each pack has 12 pens. How many pens does she have altogether?																										
Prove it	$345 \times 10 = 3450$ <table border="1"> <tr> <td>1000s</td><td>100s</td><td>10s</td><td>1s</td><td>$\frac{1}{10}$</td><td>$\frac{1}{100}$</td><td>$\frac{1}{1000}$</td> </tr> <tr> <td></td><td>3</td><td>4</td><td>5</td><td></td><td></td><td></td> </tr> <tr> <td>3</td><td>4</td><td>5</td><td>0</td><td></td><td></td><td></td> </tr> </table> <table border="1"> <tr> <td>345</td> </tr> <tr> <td>$\times 10$</td> </tr> <tr> <td>000</td> </tr> <tr> <td>$+ 3450$</td> </tr> <tr> <td>3450</td> </tr> </table>	1000s	100s	10s	1s	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$		3	4	5				3	4	5	0				345	$\times 10$	000	$+ 3450$	3450
1000s	100s	10s	1s	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$																					
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Implementation: Fluency

Mastering Number

All children across EYFS and KS1 take part in a daily 15 minute Mastering Number session as part of a project ran by NCETM. This project aims to secure firm foundations in the development of good number sense for all children from Reception through to Year 1 and Year 2. The aim over time is that children will leave KS1 with fluency in calculation and a confidence and flexibility with number. Attention will be given to key knowledge and understanding needed in Reception classes, and progression through KS1 to support success in the future.

Becoming a fluent mathematician

Each child, from Y3-Y6, takes part in a 15 minute fluency session (4 times a week) where they explore an element of fluency: counting, rapid recall, mental arithmetic and written arithmetic. In Y5/6, a fractions, decimals and percentages session is added into daily fluency in anticipation of KS2 SATs. This session is added during the Summer term in Y5.

Counting Counting is all about the study of patterns and structure; it is part of mental arithmetic. children to subitise, visualise, sequence, spot patterns, work flexibly with numbers and make connections.	Rapid recall These are number of facts that children should be able to instantly recall. Retrieval practice and rapid recall of number facts is important because if children are able to recall number facts automatically, it allows them to free up their working memory when faced with more complex questions.	Mental arithmetic These are calculations the children should be able to solve mentally using a variety of strategies and jottings to support. In the Arithmetic paper, over 80% of questions are designed to be able to be solved mentally, or through jottings. However, many children attempt the majority of the paper using formal written methods, which leads to them running out of time and not completing the paper.	Written arithmetic Arithmetic involves working with the four operations: addition, subtraction, multiplication and division. Children need to be able to distinguish between calculations that can be solved mentally, and calculations that require a formal written method.
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Implementation: Vocabulary

Vocabulary underpins the curriculum at Hayes and there is a heavy emphasis on STEM sentences across KS1 and KS2. Each lesson begins with an exploration of key vocabulary, which is readily displayed throughout the classroom on working walls. The vocabulary displayed comes directly from our vocabulary progression map.

Vocabulary progression document

Place value

	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		Same as Nursery, as well as:	Same as EYFS, as well as:	Same as EYFS/Y1, as well as:	Same as KS1, as well as:	Same as previous years, as well as:	Same as previous years, as well as:	Same as previous years, as well as:
Number and Place Value		one more one less place order number count subitise numbers up to 20 number line pictorial answer equals read write	forwards backwards numerals words multiples equal to more than less than fewer most least identify represent digit calculate odd even pattern numbers up to one hundred partition part, part, whole	ones tens digit two- digit estimate place value solve problems greater than > less than < nearest ten rounding number facts partition count in steps zero compare order determine value representation bar model	hundreds three- digit ten more one hundred more ten less one hundred less roman numeral numbers up to one thousand	thousands four- digit negative number one thousand more one thousand less decimal decimal place rounding placeholder nearest ten nearest hundred nearest thousand one place whole number integer tenths hundredths	ten thousands hundred thousands millions context steps of powers decimal equivalents two decimal places thousandths numbers up to one million	intervals across zero three decimal places hundredths thousandths ten thousandths numbers up to ten million



Removing barriers to the Primary Mathematics curriculum

At Hayes, we understand that we need to support all learners in their maths journey and that some children may need more support. We aim to identify the barriers of individual learners and remove these barriers through various strategies:

Mixed-ability pairings

Mixed-ability pairings encourage student with higher math abilities to think more deeply about alternative solutions and then are able to embed their knowledge by helping those who are less able. Mixed ability pairings encourages children to ELF: ELF and support one another with the understanding of a key concept.

Follow the CPA approach

When introducing a new concept, we ensure that we follow the CPA approach: concrete, pictorial and abstract. Children progress through this approach at their own pace and gradually have the scaffolding removed until they have mastered the abstract concept. Children will have access to the appropriate concrete manipulatives they need to master a concept.

Ensure that there is progressive challenge in maths questions

When progressing through the mastery flow, children should start by tackling the easy problems and then proceed to the tougher ones. Students are more likely to lose interest when they get stuck or when they are overwhelmed right at the start.

Small steps approach

Teachers ensure when planning and delivering lessons, that concepts are broken down into small steps. By breaking learning down into small steps, children are less likely to become overwhelmed. Small steps mean children can accomplish big things in their maths understanding!



Removing barriers to the Primary Mathematics curriculum

Plan for misconceptions

All teachers ensure that they anticipate and plan carefully for the misconceptions that may occur when teaching a new concept. This means that children are exposed to these misconceptions in guided practice before moving onto independent practice. When misconceptions are understood, this leads to a higher question success rate, which in turn, ensures a deeper understanding of a concept.

Take time to answer questions

Mathematical anxiety occurs, in part, because students feel the need to answer immediately. Teachers need to create an environment that allows the children time to think before sharing their answers. This will develop their critical thinking by allowing undisturbed wait-time. Students are encouraged to use mathematical language through use of STEM sentences.

Ensure all children are exposed to reasoning and problem solving

All children should be exposed to reasoning and problem solving questions. Reasoning and problem solving forms part of daily lessons. Specific reasoning and specific problem solving lessons are carefully planned into the maths block.

Take part in regular fluency sessions

All children take part in regular fluency sessions in KS2 and Mastering Number sessions in KS1. This ensures that children have rapid recall of key facts which they can then apply other broader concepts. These sessions are underpinned by the use of TTRS and DoodleMaths which are used regularly from Y1-Y6.

Differentiation

When children are not able to access year group expectations, in-line with their ISPS, they will follow an adapted version of the maths curriculum which closes their individual learning gaps.



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Example of the Mastery Flow

Year 5: To subtract 4 digit numbers from 4 digit numbers

1. Use the place value chart to calculate $26,342 - 4,231$

10,000s	1,000s	100s	10s	1s
2	6	3	4	2
4	2	3	1	

2. Use the place value chart to calculate $15,251 - 2,161$ (with an exchange)

10,000s	1,000s	100s	10s	1s
1	5	2	5	1
2	1	6	1	

Find the missing numbers in the bar models. Draw out the completed bar model into your books.

15,708	38,542
6,617	29,561
?	?

Solve these subtractions and draw a bar model alongside to represent them.

- 7823 - 2871
- 9823 - 8772
- 5000 - 1939
- 10,000 - 3739

Word problems

- A family has £22,658 in the bank. They spend £3,600 on a holiday. How much money do they have left?
- It is 10,553 miles from London to Sydney. It is 9,929 miles from New York to Sydney. How much further away is Sydney from London than from New York?
- A new tractor costs £12,999. A farmer has saved £9,817 so far. How much more will he need to save?
- There are 43,652 fans at a football match. 31,547 of the fans are adults. How many of the fans are not adults?
- The population of Hereford is 63,689. The population of Chester is 87,593. Find the difference between the population of Hereford and the population of Chester.
- Subtract twelve thousand, three hundred and seventy from eighteen thousand, one hundred and twenty-four.

Write your own subtraction maths story for your partner to solve.

Mr Hall has written these subtractions on the board.

$$\begin{array}{r} 45,541 \\ - 25,865 \\ \hline \end{array}$$

Rosie's workings

$$\begin{array}{r} 25865 \\ - 45541 \\ \hline 20324 \end{array}$$

$$\begin{array}{r} 68,945 \\ - 34,758 \\ \hline \end{array}$$

Amir's workings

$$\begin{array}{r} 68945 \\ - 34758 \\ \hline 34213 \end{array}$$

Explain the mistakes that Rosie and Amir have made.

Find the missing numbers

$$\begin{array}{r} 3 \square 9 6 3 \\ - 1 9 5 4 \square \\ \hline \square 0 4 1 6 \end{array}$$

1.

$$\begin{array}{r} \square 8 5 2 7 \\ - 2 4 1 \square 3 \\ \hline 2 4 \square 3 4 \end{array}$$

2.

Using the 0-9 digits to create two five digit numbers, can you find the two numbers with the smallest difference and the two numbers with the largest difference?

0 1 2 3 4 5 6 7 8 9



$$\begin{array}{r} \square \square \square \square \square \\ - \square \square \square \square \square \\ \hline ? \end{array}$$



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Knowledge and skills progression

At Hayes, we have several documents to ensure that maths is connected across every year group within the school and these documents ensure that the children's conceptual understanding and procedural skills are built upon, year after year.

Our Documents

Hayes: Calculation Policy

Hayes: Becoming a Fluent Mathematician: Written and Mental Arithmetic Policy

Hayes: Mathematical Coverage Overview

Hayes: Progression of Mathematical Skills

Hayes: Progression of Mathematical Vocabulary



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Impact of our maths provision

Pupils will leave us prepared for the next stage in their lives with:

- Quick recall of facts and procedures
- The flexibility and fluidity to move between different contexts and representations of mathematics
- The ability to recognise relationships and make connections in mathematics
- Confidence and belief that they can achieve
- The knowledge that maths underpins most of our daily lives
- Skills and concepts that have been mastered
- Have a positive and inquisitive attitude to mathematics as an interesting and attractive subject in which all children gain success and pleasure

A mathematical concept or skill has been mastered when a child can show it in multiple ways, using the mathematical language to explain their ideas, and can independently apply the concept to new problems in unfamiliar situations and this is the goal for our children. These will be assessed through: assessment, tracking, pupil progress meetings, performance management, moderation and standardisation.



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Impact of our maths provision: EYFS Data 2020-2021

	Mathematics		
	No.	%	Nat
All Students	36	63.20%	
Male	20	66.70%	
Female	16	59.30%	
Gender Gap	-	7.40%	0.00%
Disadvantaged (PPI)	12	44.40%	
Not Disadvantaged	24	80.00%	
PPI Gap	-	35.60%	
In Care	0		
Service Children	0		
Young Carers	0		
EAL	3	75.00%	
Not EAL	33	62.30%	
EAL Gap	-	12.70%	
SEN S	0		
SEN E	0		
SEN K	3	25.00%	
SEN all	3	25.00%	
Not SEN	33	73.30%	
SEN Gap	-	48.30%	
Non-Mobile	25	71.40%	
Autumn Born	11	64.70%	
Spring Born	16	69.60%	
Summer Born	9	52.90%	
Ethnicity			

Impact: Maths



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Impact of our maths provision - KS1 data for 2022

50 Pupils <u>2022</u>	<u>Maths</u>
All (50 Pupils) ARE+	$30/50 = 60\%$
All:GD	$2/50 = 4\%$
PP (24 Pupils)	$10/24 = 42\%$
PP: GD	$1/24 = 4\%$

Impact: Maths



Impact of our maths provision - KS2 data

	2018 SATS	2019 SATS	2020 (Internal Data)	2021 (Internal Data)	2022 SATS
Maths ARE	60%	93%	79%	73%	87%
National ARE	76%	79%	N/A	N/A	71%
Maths GDS	8%	41%	27%	21%	47%
National GDS	24%	27%	N/A	N/A	22%
Progress	-2.59	+4.1	N/A	N/A	+6.7



Impact of our maths provision- Multiplication Check

	Score:25	Score: 20-24	Score: 10-19	Score: 0-9
20/21 <u>Optional</u>	51%	27%	14%	8% (5 children withdrawn)
21/22 <u>Statutory</u>	27%	50%	15%	8%



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EYFS: Nursery



Impact: Maths

Representation of number through multiple ways and development of subitising.



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EYFS: Nursery

Pupil Voice

What does maths mean to you?

Using our fingers
to count.

Subitise
Use your eyes not
your brain.

Counting and
singing 5
speckled frogs.

Counting on the
bead bar.

Where have you used/seen maths outside of school.

I saw the number
12 bus.

My Mum has
numbers on her
phone.

I watch number
blocks on my TV.

When I walk
home I count on
my fingers.



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EYFS

Learning through exploration and explaining how to make the number 7.



Impact: Maths



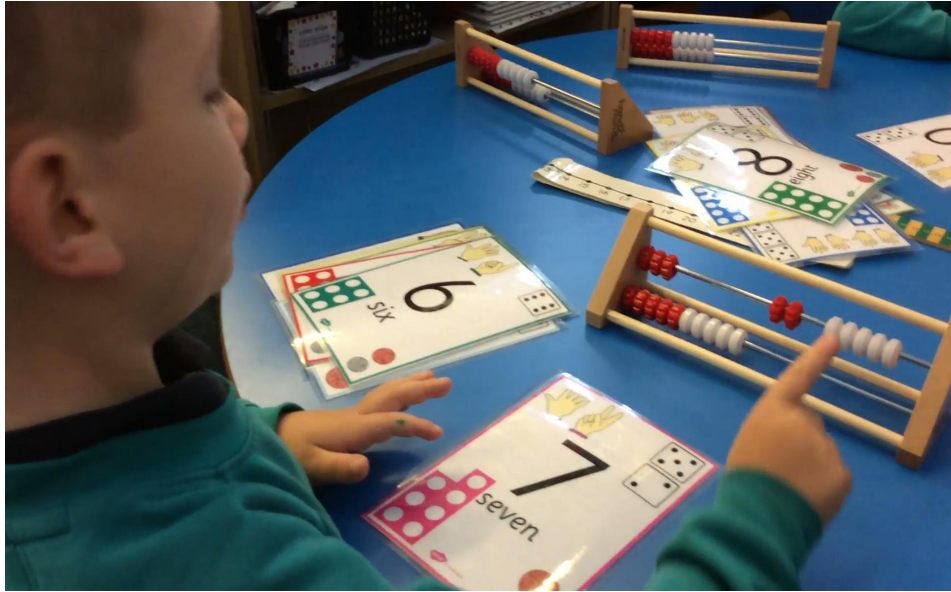
Reception's recording showing the impact on their subitising skills through the Maths Mastery Programme.



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EYFS

Rekenreks used to support subitising and number bond knowledge.





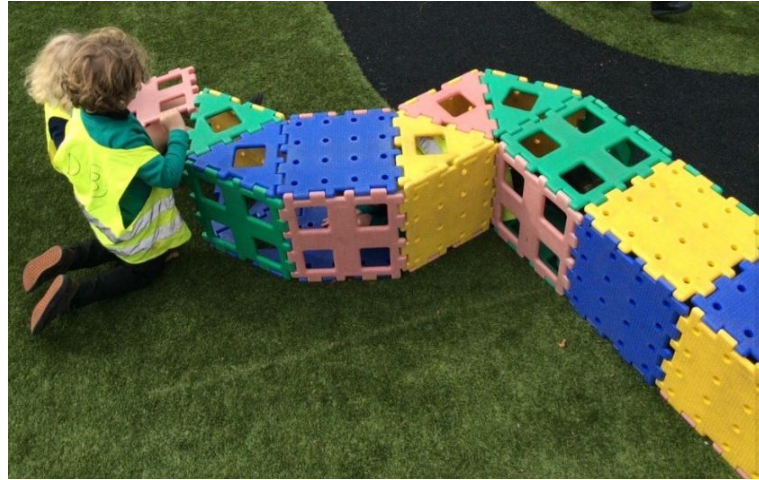
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EYFS

EYFS maths through continuous provision



How many buckets will fill the tray?



Construction with polydron enables development of shape and space.

Impact: Maths



EYFS: Reception

Pupil Voice

What does maths mean to you?

It means learning about numbers and adding numbers like 2 add 2 is 4.
it means we can count the stones and gems or whatever we want. we can make triangles.
GD

Maths means being able to make and write numbers.
ARE

It means counting and singing songs like 5 currant buns.
WTS

It means counting.
SEN

Where have you used/seen maths outside of school.

I buy my sweets at the shop. GD

I can count the house numbers on the way to school. ARE

I count my teddies at home.
WTS

On the TV/ipad.
SEN



EYFS: Reception

How would you rate yourself as a mathematician?

5/5
GD

4/5
ARE

5/4
WTS

5/5
SEN

What are you most proud of in maths?

Counting to 100
on the bead bar.
GD

Counting without
counting and just
saying the number. I
see 4 so I say 4.
ARE

Counting on
the tens frame.
WTS

Singing zero
hero counting
song.
SEN



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Year 1



Concept of numberline work.



Representing 2 digit numbers

Impact: Maths



Year 1

What does maths mean to you?

It means counting,
equal numbers and
doubles. It is
important because you
need it when you use
money. GD

Drawing and writing
numbers and make
the numbers.
ARE

It's about
counting and
taking away.
WT

Numbers.
SEN

When have you used maths outside of school?

I count objects
at home.
GD

I have seen
number 5 in a
picture
ARE

I count people
on my way to
school.
WT

I saw number 7
on my block of
flats.
SEN



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Year 1

How would you rate yourself as a mathematician out of 5?

5/5

GD

5/5

ARE

$\frac{4}{5}$

WT

3/5

SEN

What are you most proud of in maths?

Writing big numbers.
I made 50 with 5
tens and 5 lots of ten
on the bead string.

When we make and
draw ten and 9.
ARE

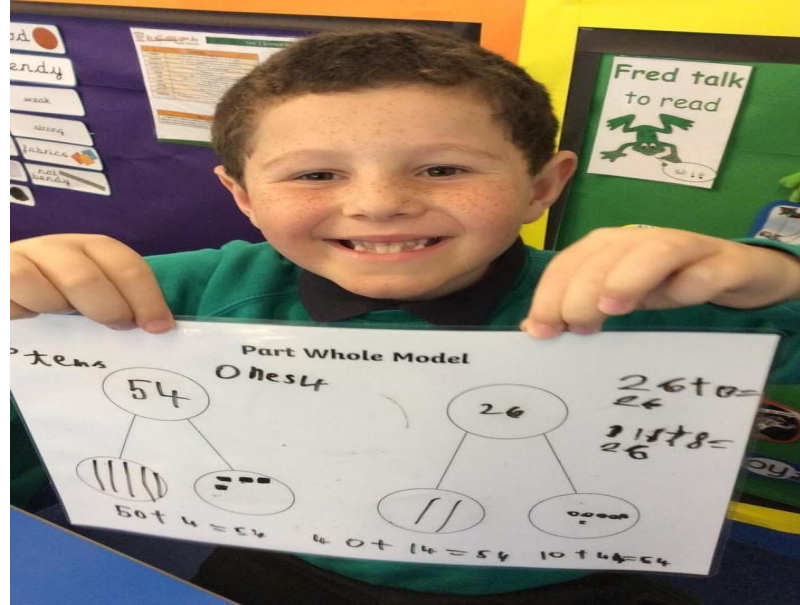
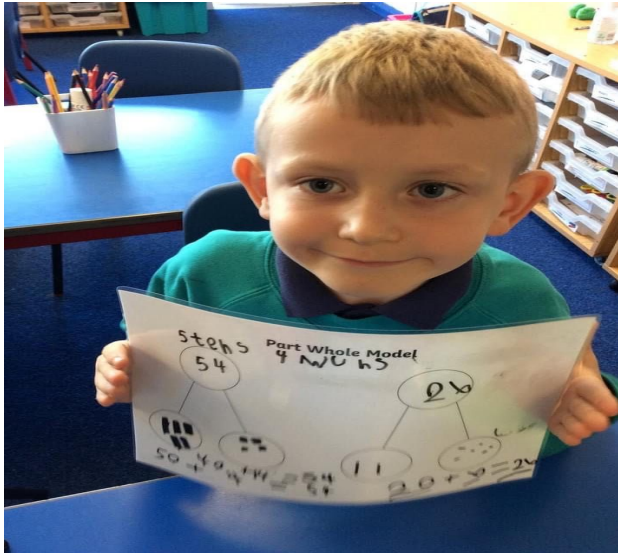
Write my numbers
to ten.
ARE

I can count the
numicon pieces
and put them in
order.



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Year 2



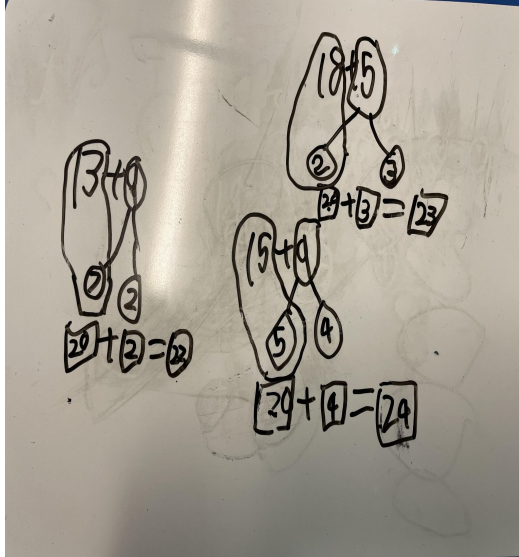
Part part whole model and other resources used to represent addition of two two digit numbers.

Impact: Maths



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Year 2



Rekenrek used to show quick subitising within two digit numbers and relate number bonds to ten.



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Year 2

What does
maths mean
to you?

Maths makes me feel confident. I am really proud that I can do multiplication and division questions because I know my times tables.

GD

Maths means counting and using numbers. Outside of school I use money at the shop.

SEN

Maths means doing fun questions with the tens and ones.

WTS

Maths makes people smart. I am really proud of getting better on TTRS.

ARE



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Year 2

How have you
used maths
outside of
school?

I do maths with my
parents. TTRS and
doodle maths. I also
add up things I see on
the way to school.

GD

Outside of school, I use
money at the shop.

SEN

I do maths at home in a
book and I play purple
maths.

WTS

I play games with
numbers and I need to
use my maths as it can be
hard.

ARE



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Year 2

How would you
rate yourself as
a
mathematician?

5/5
GD

2/5
SEN

4/5
WTS

4/5
ARE



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Year 2

What are you
most proud of
in maths?

Learning division and
multiplication and working out
really hard questions.
GD

Counting up and down and
being good at doing maths.

SEN

Counting in 2s, 5s, 10s and
knowing what 10×10 is.

WTS

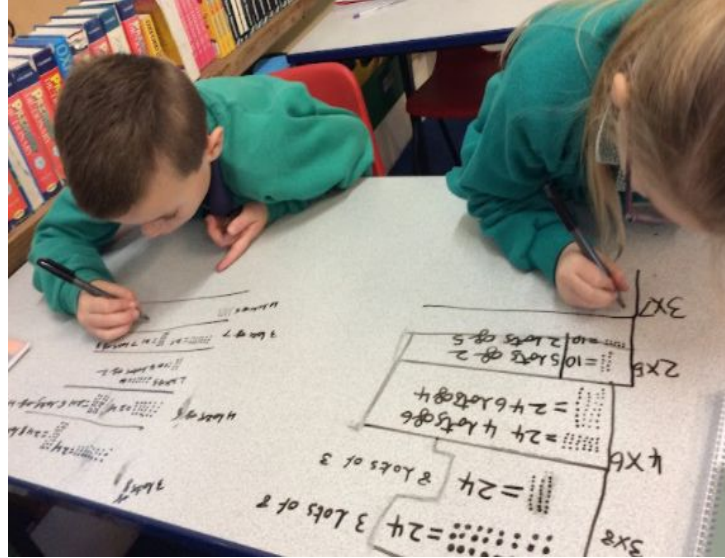
Counting money and
knowing what odd and even
numbers are and how to
spot them.

ARE



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Year 3



Using Dienes (Base 10) to identify and understand place value within 2-digit numbers, moving onto pictorial representations of each digit.

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Year 3

'Describe maths in your classroom'...

GDS - Maths displays to help us and calculations in our books

ARE - We have a working wall that is full of maths examples

WTS - Calculations and working walls

'When you find maths challenging, what is available to help you?'

GDS - Teachers, TA's and maths resources

ARE - Teachers and my friends

WTS - Friends, teachers and equipment

'How does your teacher support you in understanding something that you find challenging?'

GDS - Our teachers show us a way to improve on our learning for next time

ARE - They sit with us and talk through the maths with us

WTS - They help us to do it



Be all you can be
Hayes School

Year 3

'Why is maths important?'

GDS - It helps us to challenge our brains and it helps us to get jobs when we are adults

ARE - We need to learn it for when we get older.

WTS - It's important because it makes you smart and you learn new things

'What do you enjoy most about maths?'

GDS - I like getting feedback to show me what to improve on

ARE - Tally charts

WTS - Getting the answer right

'What do you find the most challenging about maths?'

GDS - I worry about learning new things as it takes me a while to understand it

ARE - Times tables

WTS - Money



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Year 4



1. Take 10 cubes and represent 2 wholes, with 5 equal parts in each.
2. Now, using cubes, represent 5 fifths using one colour and 5 fifths in another colour.
3. This time, make sure that the cubes used to represent each fifth is the same colour apart from 1 fifth. How many fifths are the same colour?
4. Using your cubes, represent 7 fifths and represent this fraction on the image below.

1 whole and $\frac{2}{5}$

Blue 1
Look at the images below. Write the fraction that has been represented by each image.

a. 3 wholes and $\frac{3}{4}$ or $1\frac{3}{4}$

b. 1 whole and $\frac{1}{4}$ or $\frac{5}{4}$

c. $\frac{3}{4}$ No wholes.

d. $\frac{5}{10}$ No wholes.

Circle the fractions that are greater than 1.

Blue 2
Represent the following fractions by shading the bar models accordingly

a. $\frac{1}{5}$ ✓

b. $\frac{4}{5}$ ✓

c. $\frac{6}{5}$ ✓

Which fraction is the odd one out? Explain.

It is the odd one out because it is the only one that hasn't shaded over one whole.

Blue 3
Represent the following fractions

a. $\frac{8}{5}$ b. $\frac{7}{4}$ c. $\frac{10}{3}$

a. ✓

b. ✓

c. ✓

Green 1
Write the following fractions using numbers

1) one whole and one half 1 whole and $\frac{1}{2}$ ✓

2) one whole and one sixth 1 whole and $\frac{1}{6}$ ✓

3) two wholes and three quarters 2 wholes and $\frac{3}{4}$ ✓

4) one whole and five eighths 1 whole and $\frac{5}{8}$ ✓

Impact: Maths



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Hayes School

Year 4

'Describe maths in your classroom'...

GDS - A navy blue book, which contains mathematical calculations

ARE - We use our understanding of calculations to answer questions

WTS - We have a working wall and sometimes, we do fun activities

SEN - Times tables

'When you find maths challenging, what is available to help you?'

GDS - My resource pack, maths equipment and my teacher

ARE - My friends, multiplication squares, our teachers.

WTS - Teacher, TA, ruler, multiplication square, whiteboard

SEN - The teacher

'How does your teacher support you in understanding something that you find challenging?'

GDS - She encourages me to try something new and teaches us that we learn from our mistakes

ARE - She makes maths simple and easy

WTS - She supports me to use my resources. She goes through it and writes it in my books

SEN - She helps me to understand



Be all you can be
Hayes School

Year 4

'Why is maths important?'

GDS - It strengthens our education and can help us in our future careers

ARE - When you have a job, it will be easier to do maths

WTS - It helps with your numbers and it is important for life

SEN - To learn

'What do you enjoy most about maths?'

GDS - You learn different things and get to experience it with the help of a friend. It also teaches you to be independent

ARE - Our teacher - she is good.

WTS - When we did the multiplication flowers. I like number lines and times tables

SEN - Odd and even numbers

'What do you find the most challenging about maths?'

GDS - Learning things that I've never experienced before

ARE - fractions

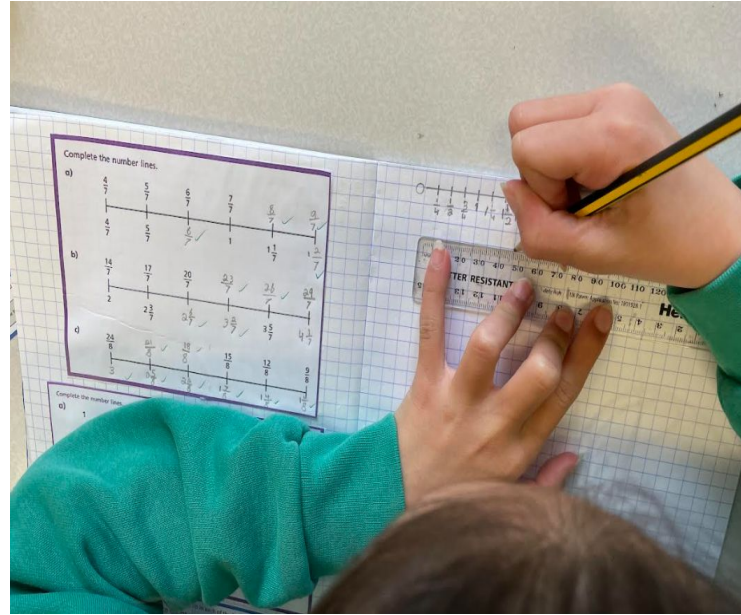
WTS - When I am given challenges (reasoning problems)

SEN - I'm not very good at dividing



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Hayes School

Year 5



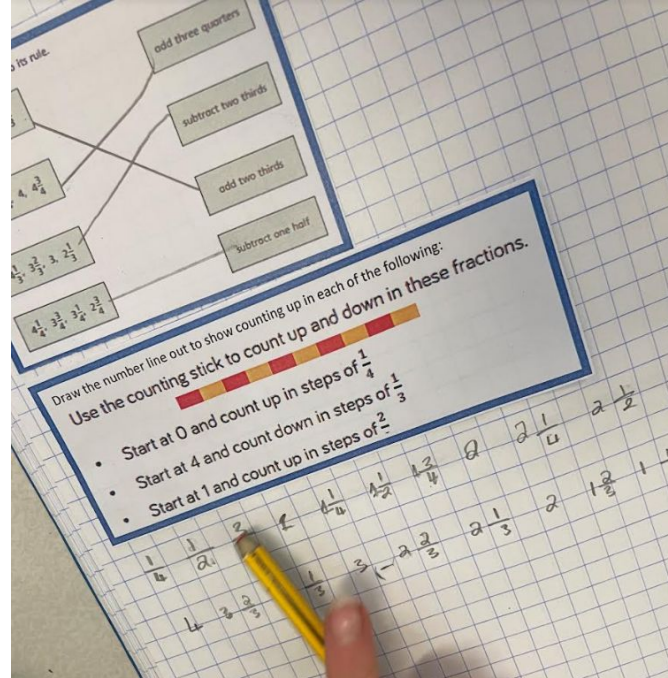
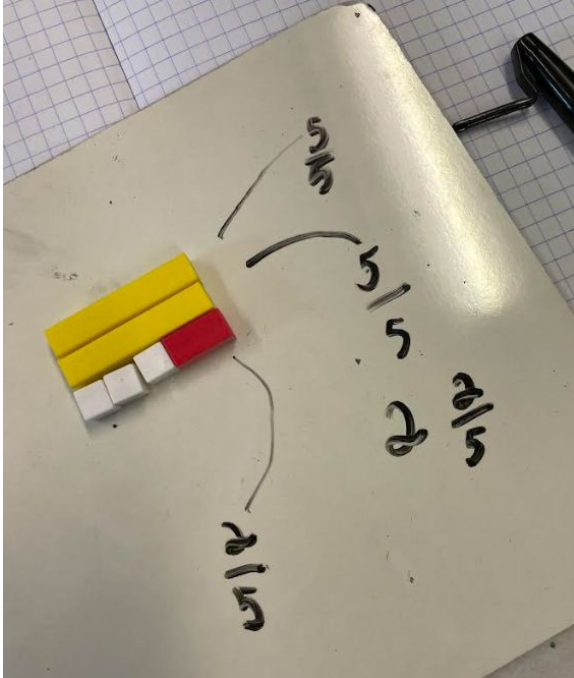
Using cuisenaire to represent mixed numbers.

Impact: Maths



Be all you can be
Hayes School

Year 5





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Hayes School

Year 5

'Describe maths in your classroom'...

GDS - The teacher explains the maths and we answer questions in our books

ARE - Our classroom has working walls at the back of the classroom and the teacher stands at the front to explain our lesson

WTS - There are maths walls

'When you find maths challenging, what is available to help you?'

GDS - Friends, TA, teacher and the board

ARE - I talk to my friends and teachers

WTS - Teachers and friends

'How does your teacher support you in understanding something that you find challenging?'

GDS - They explain how they would work it out and explain the meaning of words that I don't understand

ARE - They help me by going through the question and explaining how I might find the answer

WTS - They show me, step-by-step



Be all you can be
Hayes School

Year 5

'Why is maths important?'

GDS - When we are older, it will help us with our jobs

ARE - You can get a good job

WTS - To learn

'What do you enjoy most about maths?'

GDS - Maths games

ARE - Times tables

WTS - The challenges

'What do you find the most challenging about maths?'

GDS - multiplying 3-digit numbers by 1-digit numbers

ARE - Fractions

WTS - Division



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Hayes School

Year 6



There are 15,600 people at a concert.
There are 9,050 adults.
The rest are children.
How many more adults than children are there?

15600	
9050	6550

✓

15600
- 9050
6550

9050	
6550	2500

✓

9050
- 6550
2500

There are 2500 more adults than children. ✓

A milkman has 250 bottles of milk.
He collects another 160 from the dairy and he delivers 375 during the day.
How many bottles of milk does he have left?

410	
250	160

250
+ 160
410

410	
375	35

410
- 375
35

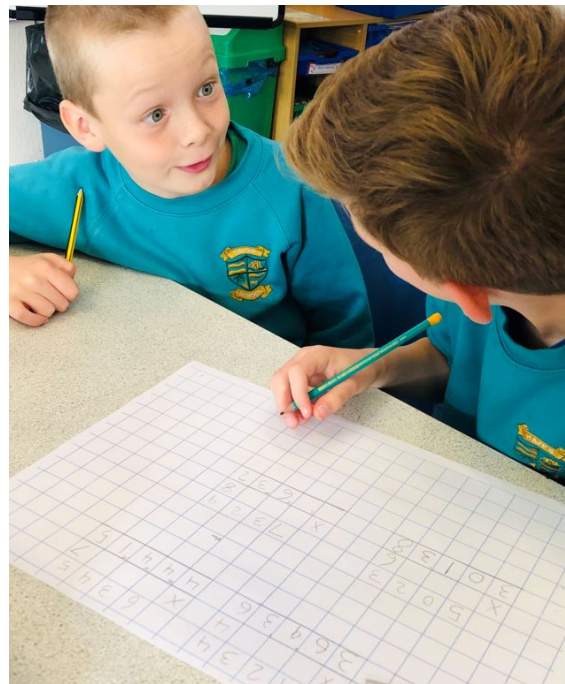
Working together to reason and problem solve

Impact: Maths



Be all you can be
Hayes School

Year 6



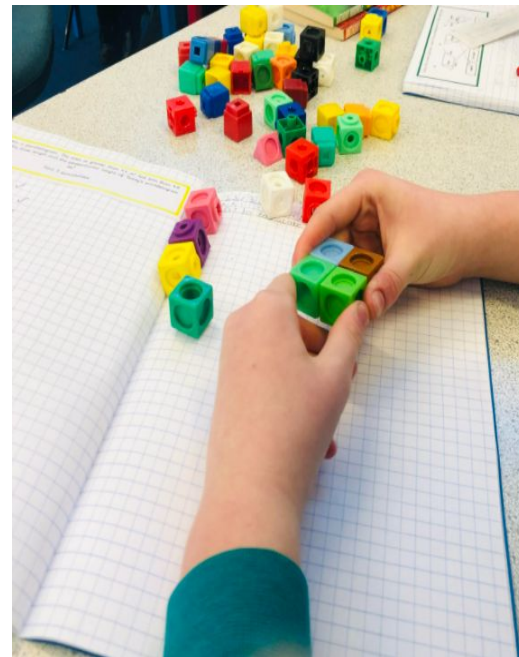
Practising formal, written calculations

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Hayes School

Year 6



Counting cubes to calculate the volume of 3D shapes

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Hayes School

Year 6

Find the missing fraction. Write the number sentence.

Complete the part, part, whole models

What common denominator could you use to calculate with these fractions?

Solve

Eva has a full tin of paint. She uses $\frac{1}{2}$ of the tin on Friday, $\frac{1}{3}$ on Saturday and $\frac{1}{6}$ on Sunday. How much paint does she have left?

Represent this problem using a bar model

Match the diagram to the number.

What is the value of the underlined digit in each number?

What is different about number 6?

Represent the following numbers on a place value chart

Write each of the numbers in words

Mastery flow: varied fluency

Impact: Maths



Year 6

Circle the odd one out.

5.031×2.4
 602.3×4
 4.751×8

Explain your reasoning.

$$\begin{array}{r} 5.031 \\ \times 2.4 \\ \hline 20124 \\ 10062 \\ \hline 120744 \end{array}$$

If 3.023 litre is in 100 decimal part, write the layout is different and the answer is much bigger.

Mr Smith shares the calculation below with Class 8: $5.47 \times 8 = 43.76$.

What mistake has Fay made? What is the correct answer?

$$\begin{array}{r} 5.47 \\ \times 8 \\ \hline 38.52 \end{array}$$

Fay has joined the whole numbers together and left the 47.

Chocolate eggs can be bought in packs of 1, 6 or 8 What is the cheapest way for Dexter to buy 25 chocolate eggs?

 7X

 6X

 8X

$$\begin{array}{r} 52 \\ \times 7 \\ \hline 364 \\ \hline 2856 \\ \times 23 \\ \hline 2855 \end{array}$$

$8 \times 11 = 88$ $11 \times 11 = 121$

10. To identify relevant problems involving division and subtraction

Mrs. Jackson has saved \$98.90. She shares the money between her 12 grandchildren. How much do they each receive?

$\$98.90$
 $\$8.241\bar{6}$

15. 0.546
 $15 \overline{) 9.690}$

2. Fill in the missing numbers in the following calculations.

a) $0.4 \times 22.5 = 9.0$ b) $0.7 \times 27.4 = 19.18$

3. 0.52
 $4 \overline{) 20.8}$

0.7
 $7 \overline{) 4.9}$

Here is a number pyramid.
 The number in each box is the product of the two numbers below it.
 Write the missing numbers.

22.5
 4.5 5
 2.5 2.5

9 4.5 22.5
 2.5×2.5 2.5×4.5 4.5×4.5

Large pizzas cost £5.50 each.
 Small pizzas cost £2.75 each.
 Five children together buy the largest pizzas and three small pizzas.
 They share the total equally.
 How much does each child pay? £3.75

6.75 20.25
 $\times 3$ $\div 5$
 20.25 4.05

10.25 13.75
 $\times 3$ $\times 3$
 30.75 41.25

Mastery flow: reasoning and problem solving

Impact: Maths



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Year 6

1. Find the answer to $1002 \div 1002$ and the same. $1002 \div 1002 = 1$. The answer is 1.

2. Find the answer to $1002 \div 1002$ and the same. $1002 \div 1002 = 1$. The answer is 1.

3. Find the answer to $1002 \div 1002$ and the same. $1002 \div 1002 = 1$. The answer is 1.

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Mastery flow: reasoning and problem solving

Impact: Maths



Be all you can be
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Year 6

‘Describe maths in your classroom’...

GDS - We all start off listening to the teaching and then we have colour coordinated maths challenges - red being the hardest and purple being the easiest. We sometimes start off on different colours depending on what we understand. We self mark our work too unless it's reasoning.

ARE - It's very good because of the displays in the classroom and the colour challenges in your books.

WTS - Maths in our classroom is fun. We have a set of challenges that we are taught, lots of resources and even our partners.

SEN - We have challenges that get harder and we have to self mark sometimes.

‘When you find maths challenging, what is available to help you?’

GDS - We can do ELF:ELF, which is where we talk to our partners or we can have ELF help (from our teachers). We can also use Self Help and look at the display

ARE - Partners (ELF:ELF), the displays in the classroom and teachers

WTS - The working wall, our teachers, the notebook to go back through and ELF:ELF. It's good to try it on your own first though.

SEN - Whiteboard, display, flipchart, washing line, pictures, equipment and teachers

‘How does your teacher support you in understanding something that you find challenging?’

GDS - Our teacher breaks down the question and explains it clearly. She then might use green pen to model it on our books.

ARE - By speaking to us in person and on our own, unless there's a group of us and then she explains it at the front again.

WTS - They try their best to get around to everyone in the classroom. They usually mark the answer correct but if it isn't they model an example for us to use.

SEN - They show us the method on the whiteboard or in our books and then we have a go at a similar question



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Year 6

'Why is maths important?'

GDS - We need to pass our GCSE maths and every job includes some sort of maths: cashier, banker and even the military as you need to estimate.

ARE - For your SATs, your GCSEs and your future job. It prepares us for life

WTS - To get a job and pass exams. Our future needs it too: every job requires maths

SEN - To learn and use in life. If you want to be a teacher, you need to know maths.

'What do you enjoy most about maths?'

GDS - I enjoy working through challenges and getting to red. I also love challenging my teacher to a Rock Slam on TTRS.

ARE - The presentation of our questions and the representations that are used. I like learning percentages, using the bar model

WTS - My favourite part of maths is TTRS and Doodle Maths. I also like fractions and the four operations.

SEN - All of the four operations and challenging myself

'What do you find the most challenging about maths?'

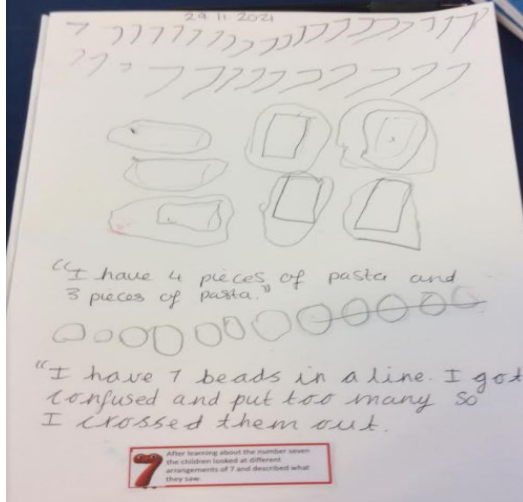
GDS - I find algebra the hardest as I find it difficult to substitute the letters for numbers in equations

ARE - Division can be tricky sometimes and coordinates on the four quadrants

WTS - I find percentages and algebra quite tricky because there's lots of steps.

SEN - Conversions, fractions and shape

ELF: Empowering Learners Through Feedback



Reception
representing
ways to make 7
and showing self
correction.





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'Times Tables Rockstars' (TTRS)

From Year 2 - Year 6 at Hayes, we use the programme 'Times Tables Rockstars' (TTRS) to raise the profile of times tables and develop the rapid recall of multiplication and division facts up to 12×12 . This programme offers initial baselines to allow teachers to pitch their tables at the right level. Features such as 'set the tables' allow us, as teachers, to select the tables for individual children or groups based on their baseline for them to practise during 'studio' games. There is also a function that allows children to practise all of the tables in a game mode called 'garage practise'. Recently, we have relaunched TTRS to promote the access of the programme outside of school. During the relaunch day, we shared a whole school assembly, where we discussed the importance of recalling our times tables. We launched a whole school tournament (we were all incredibly competitive) and the winner of the tournament was provided with a 'Hayes School Rock Star Legends certificate'. Tournament points were gained by children's scores during game play and each class appeared on a whole school leaderboard. This was shared regularly to encourage the children to score as many points as possible both inside and outside of school. Finally, launched a times table board game competition, where the children had to create a game and a clear set of rules that focussed on multiplication and division facts. As if this wasn't exciting enough, we completed the whole day dressed as our very own rock stars!

TTRS



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TTRS





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TTRS





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Numbots

In year reception and year 1, we use the programme numbots to help develop children's subitising and number bond skills. We recently launched the programme by joining in the 'Timetable Rockstar Day' and also by creating our very own numbots. The children also have access to this at home to help increase the fluency of these vital mathematical skills in the early years.





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Numbots



Numbots



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Doodle Maths

DoodleMaths is an interactive and adaptive learning program (based on the national U.K. curriculum) for strengthening old math skills and learning new ones. The first time in the program, students take a short calibration quiz. This data is used to generate "4/5/6/7 a Day" practice questions. If a practice problem becomes tricky, students have ways to find help. These options include taking a hint, reading or listening to a written explanation, and, in some cases, saving the question to a list of Tricky Questions, which is later reviewed with an adult. This is the only way for students to review questions, as they cannot go back and review questions missed or see previous question sets.

Not only do students have access to a magnifying glass to zoom in on any part of the screen, as well as a Doodle Pad that acts as virtual scratch paper, but each question and explanation can also be read out loud. There's also a toolkit for selected questions with useful items like protractors and rulers.

As students correctly answer questions and play games, they earn stars, which are exchanged to build customizable cartoon robots. Each student account also includes a section called My Pages. In this section, students are able to find their robots, access doodle pages, view their progress, and, if enabled by the teacher, message friends.



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Doodle Maths

Question 6

Calculate using long multiplication:

	2	3	4	3	9	6
x					2	5
	1	7	4	8	0	
	6	9	9	2	0	
		6	4	0	0	

0	1	0	1
2	3	2	3
4	5	4	5
6	7	6	7
8	9	8	9

DONE

Question 4

What is $3400 \div 100$?

I'd like...

- ...a hint
- ...an explanation
- ...to report this question

DONE

1	2	3
4	5	6
7	8	9
.	0	del



Doodle Maths



Question 1

Describe and plot specified points on a 2-D coordinate grid and draw sides to complete a given polygon

A coordinate shows where something is on a grid.

The **first part** of the coordinate tells you how far **along** to go.
The **second part** tells you how far **up** to go.

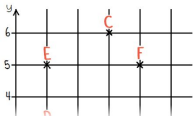
One way to remember it is by saying:

'along the corridor and up the stairs'

Coordinates always go in brackets and are separated by a comma.

Example 1:

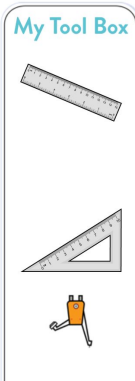
The coordinates of **A** are (3, 1)

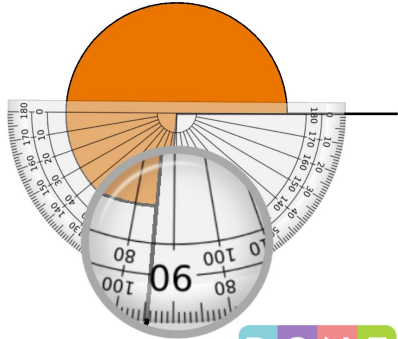




Question 1

To work out the size of the reflex angle, start by measuring the obtuse angle.





DONE



My Stars



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Doodle Maths

