

The Wasted Years no more

("The journey from EYFS to KS4 and why you need to know it!")



ArthurTerry
Teaching School Hub
North Birmingham



Education
Endowment
Foundation

Accredited Professional
Development Lead

National Centre
for Excellence in the
Teaching of Mathematics



TOM MANNERS
Loves Talking Maths Teaching

Who am I?

- Tom Manners –
tommanners.substack.com,
[@Mannermatics](https://twitter.com/Mannermatics),
www.tommanners.co.uk
- PGCE tutor for Maths at Arthur Terry Teaching School / SCITT.
- Work for the NCETM as a Teaching for Mastery specialist, NCETM PD Lead, Intensive Support Partner and other work-groups leader
- Evidence Lead in Education (ELE) for EEF
- Specialist Leader of Education (SLE)
- Former Trust Maths Lead for two different MATs
- Self-employed school support



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MY AIMS TODAY

- To make you smile
- To make you think
- To make you reflect
- To make you angry
- To challenge you
- To challenge you to consider to make change

NOT MY AIMS TODAY

- For you to agree with everything I say
- For you to have nothing to take away

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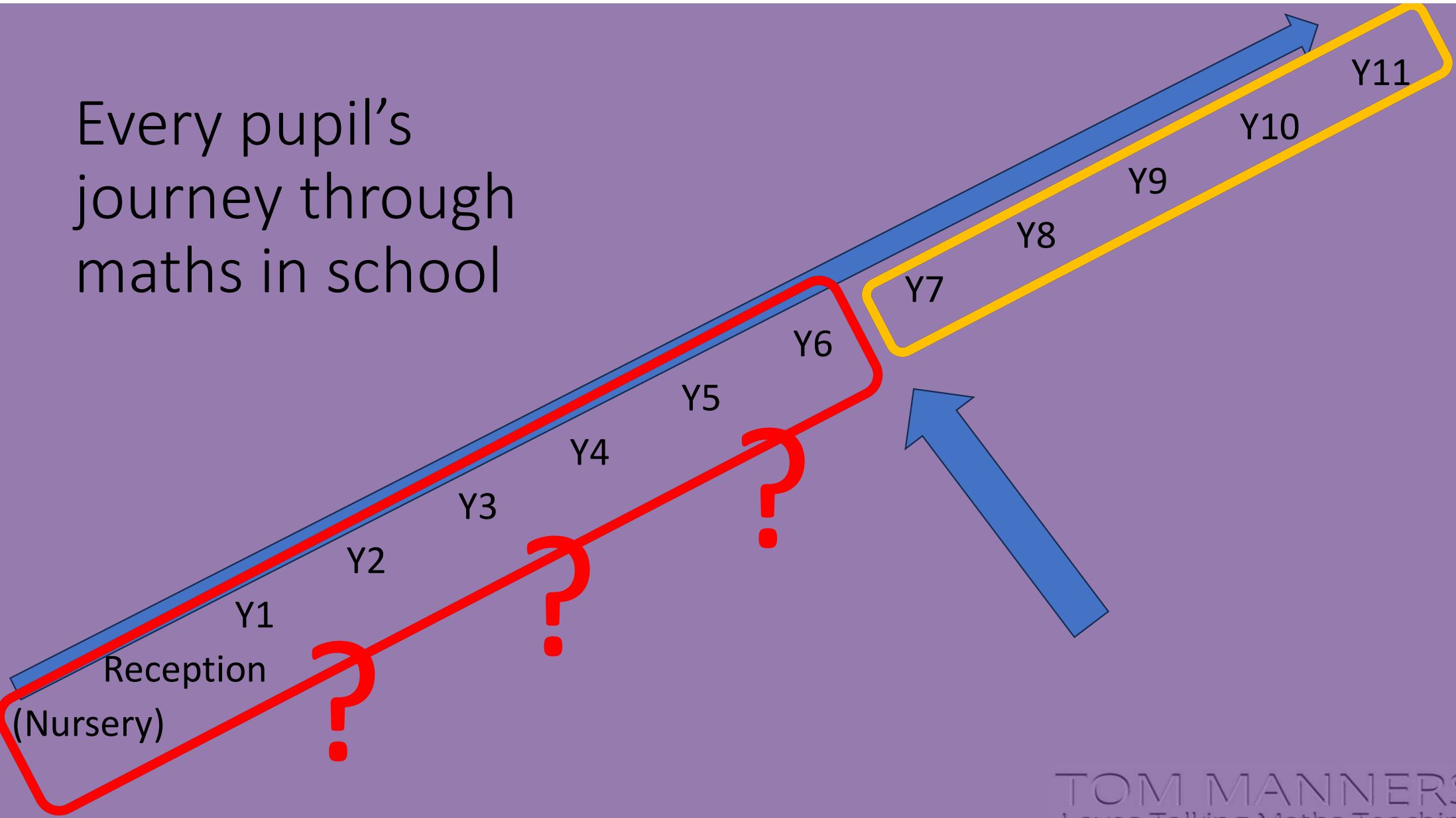


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LOVES TALKING MATHS TEACHING

Every pupil's
journey through
maths in school



Key Stage 3: the wasted years?

The status of Key Stage 3 as the poor relation to other key stages was exemplified in the way schools monitored and assessed pupils' progress. Inspectors found that **too many secondary schools did not work effectively with partner primary schools to understand pupils' prior learning and ensure that they built on this during Key Stage 3**. Worryingly, some secondary leaders simply accepted that pupils would repeat what they had already done in primary school during the early part of Key Stage 3, particularly in Year 7.

10 years later...



- “74% of secondary students told us that the maths covered in secondary school has repeated things that they learned in primary school.”
- “Our mapping of the National Curriculum finds that much of the Key Stage 2 content is repeated in Key Stage 3. Examples include: identifying prime or square numbers from a list; working out the percentage of a large rectangle that is shaded; calculating amounts spent, or change to be given; and calculating with fractions”

Every year 30,000 children who were top performers at the end of primary school don't go on to get top GCSE grades in maths.

Half of top performers who were on free school meals aged eleven are no longer top performers by sixteen



Something goes wrong as they leave primary school

We surveyed **2000** pupils in years 6–9 and found that when high-attaining pupils transition to secondary school they become:

25%

less likely to say
maths is fun

40%

more likely to say maths
isn't challenging enough

**Twice as
likely**

to say maths
is boring

Why Year 7s don't like maths



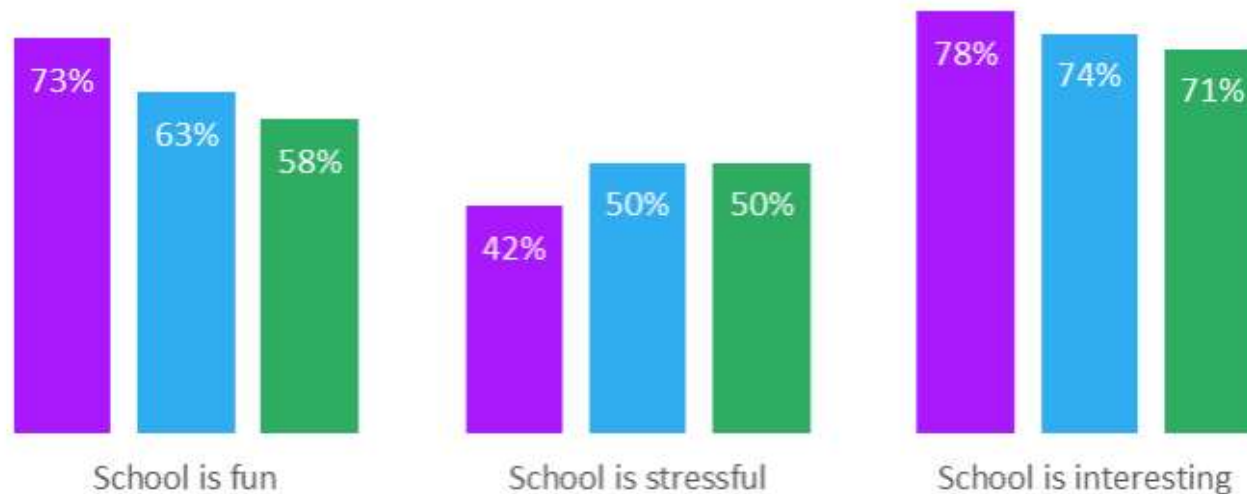
- Year 5
 - 21% of English pupils scored as “advanced” in TIMSS in 2019, compared to an international average of 7%.
- Year 9 - less rosy.
 - No statistically significant improvement since 2007.
 - 11% score as advanced, compared to an international average of 5%.

The Year 7 School Switch-Off By Spring



Feeling toward school

■ Y6 Term End ■ Y7 Term 1 ■ Y7 Term 2



What's going on in their minds



- Huge change in social circles / number of people around them.
- They were the eldest... now they are the youngest!
- Suddenly they receive regular homework.
 - Do they know how to apply themselves at home?
 - Do they have the right environment to help them complete this?
- Role models / relationships with adults.
 - They now need to know more adults and may not feel safe.
 - Loss of psychological safety?

ChatGPT 4o >

Can you create an image for me of a teacher getting hot under the collar in a very hot environment, maybe with fire in the background

Image created



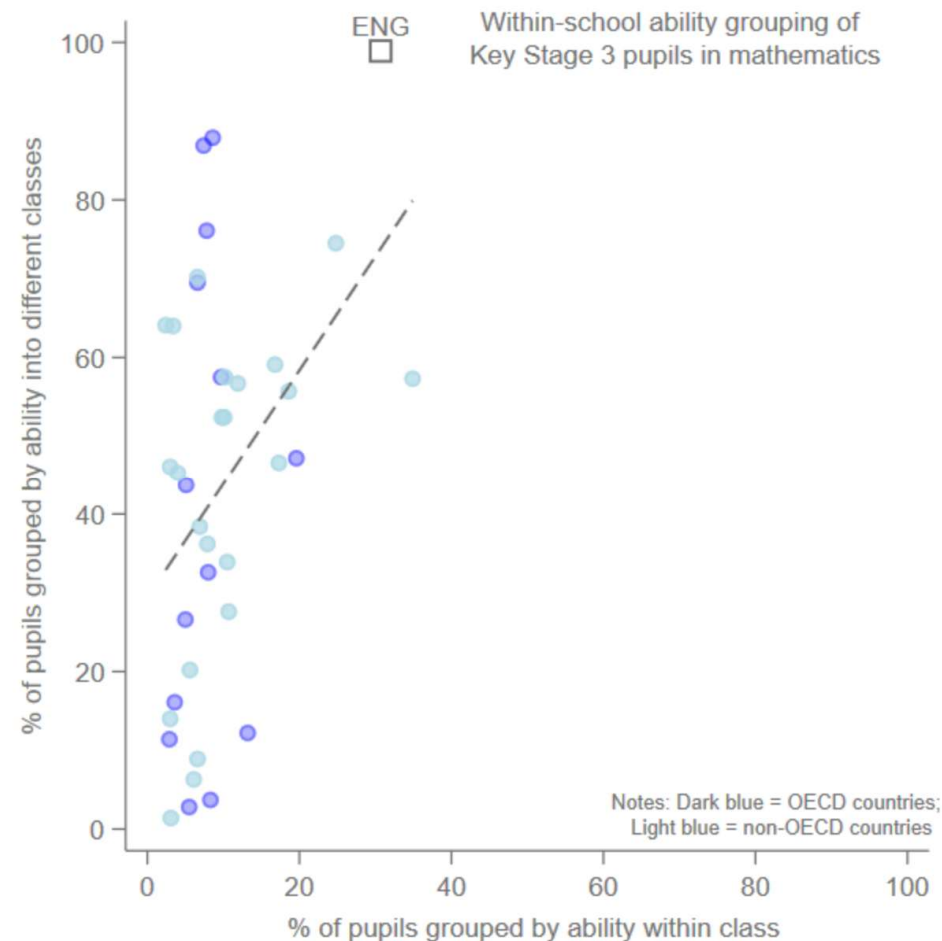
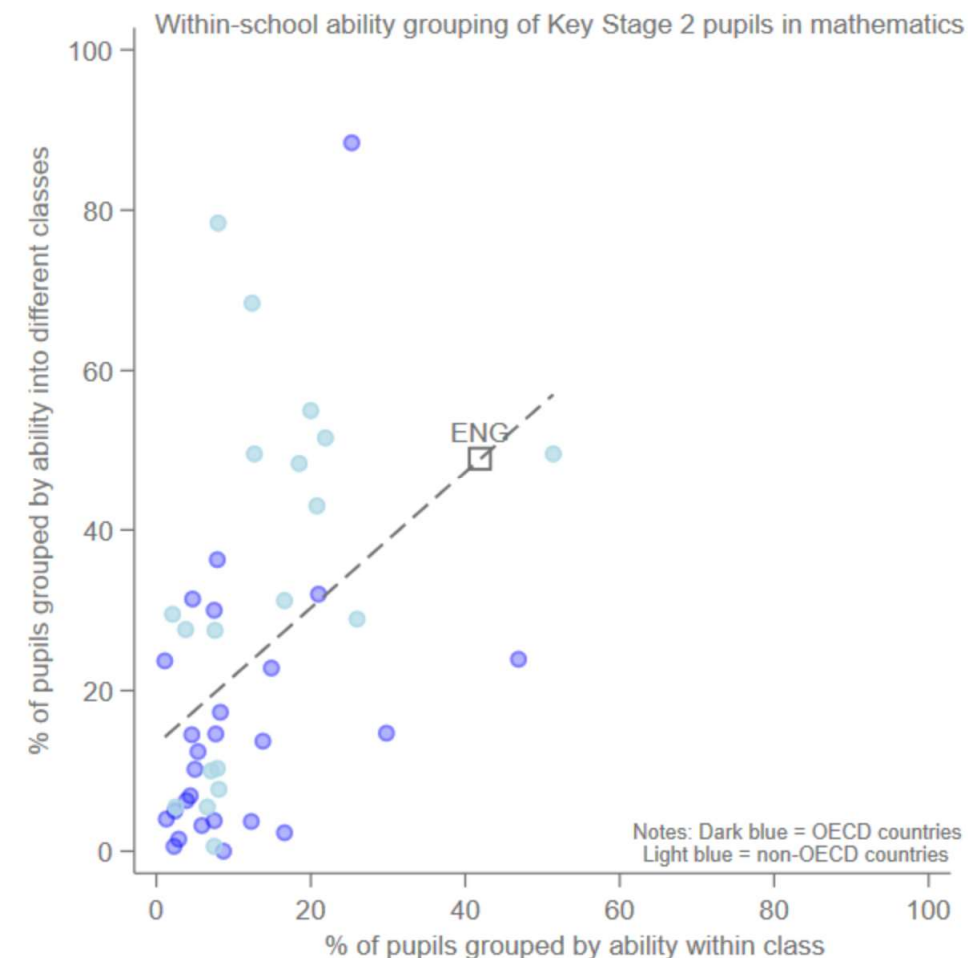
Things are
going to get
spicy for a
moment..



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Loves Talking Maths Teaching

Setting by ability!

England's schools segregate by ability more than almost every other country in the world



High-attaining maths pupils make more progress when grouped by attainment, EEF and UCL research finds

New research on student grouping in maths, conducted by the UCL Institute for Education

The researchers found that students with low prior attainment in KS2 maths made similar progress in maths, whether they were taught in sets or not.

While the study found no difference in the progress, the researchers indicated there is less “security” in this conclusion, because the cohort of students was smaller.

According to the report, students with high prior attainment in KS2 maths saw their progress slow by two months when they were taught in schools with mixed groups rather than sets.

Similar to the findings on low attainers, the EEF says these results may have “lower security” than the overall findings because of the smaller number of students.

High-attaining maths pupils make more progress when grouped by attainment, EEF and UCL research finds

New research on student grouping in maths, conducted by the UCL Institute for Education

Based on these findings and existing research, the EEF is recommending that:

- Schools who choose to use mixed-attainment groups should ensure maths teachers provide stretch opportunities for high-attaining pupils.
- Schools who choose to group students by attainment should ensure that specialist maths teachers are not concentrated in the top sets, and that it is possible for pupils to move between groups depending on attainment.

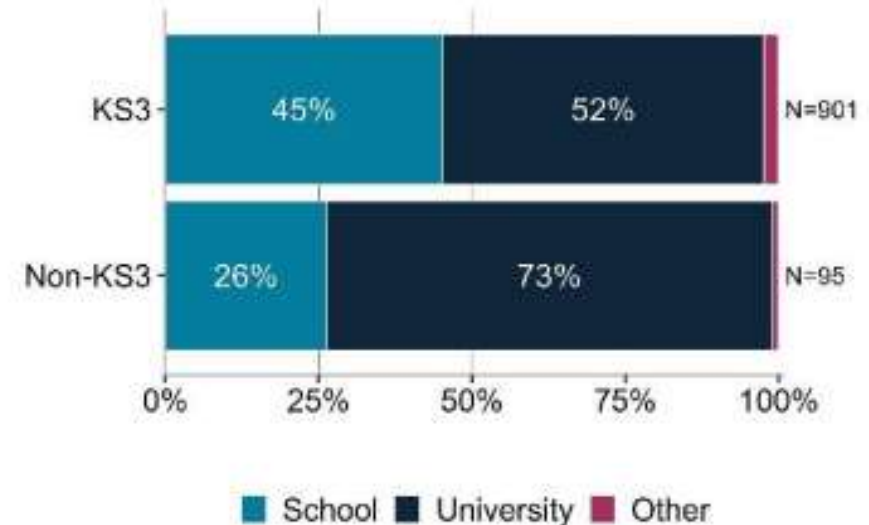
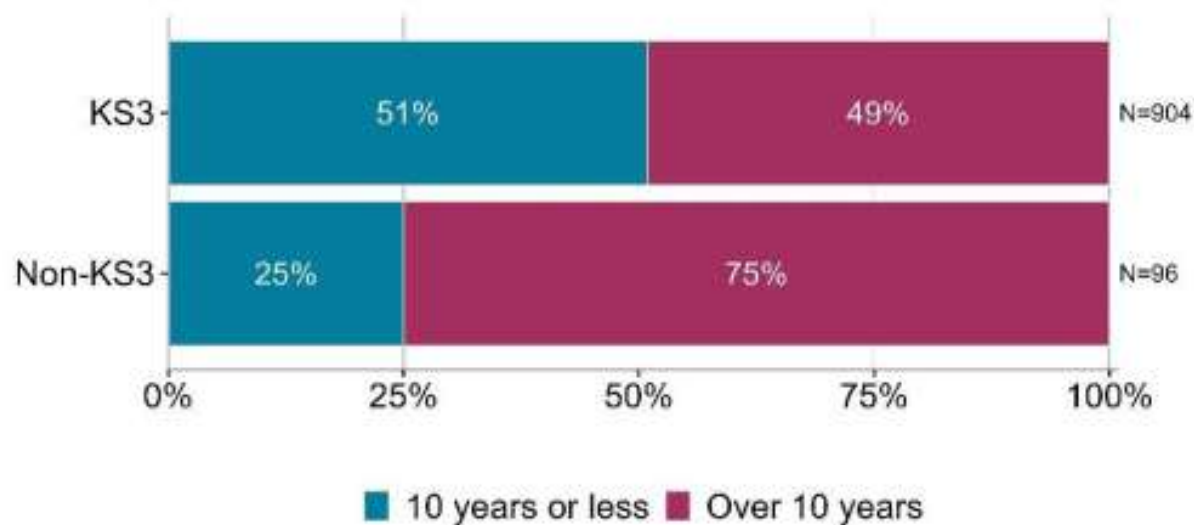
Key Stage 3: the wasted years?

The weaknesses in teaching and pupil progress identified by inspectors reflect **the lack of priority given to Key Stage 3 by many secondary school leaders**. The majority of leaders spoken to as part of this survey said that they **staffed Key Stages 4 and 5 before Key Stage 3**. As a result, some Key Stage 3 classes were split between more than one teacher or were taught by non-specialists.⁵

KS3 teachers of mathematics are less experienced and less well-qualified in mathematics than those who only teach KS4/KS5



Observatory for
Mathematical
Education



<https://www.nottingham.ac.uk/observatory/documents/reports/ks3-teachers-of-mathematics-tr-2501.pdf>

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Key Stage 3: the wasted years?

Nevertheless, inspectors also found examples of good practice. In the best secondary schools, leaders set the right culture and ethos to create the kind of orderly, purposeful learning environment that is the bedrock for successful learning. Teachers had a comprehensive understanding of pupils' prior learning, gained through well-established ways of working with their partner primary schools. As a result, they were able to ensure that they built on this at Key Stage 3. The headteachers in these schools made Key Stage 3 a high priority for all staff, pupils and parents. In order for secondary schools to continue to improve, this good practice needs to become the norm.



My “Cotton Eye Joe” theory

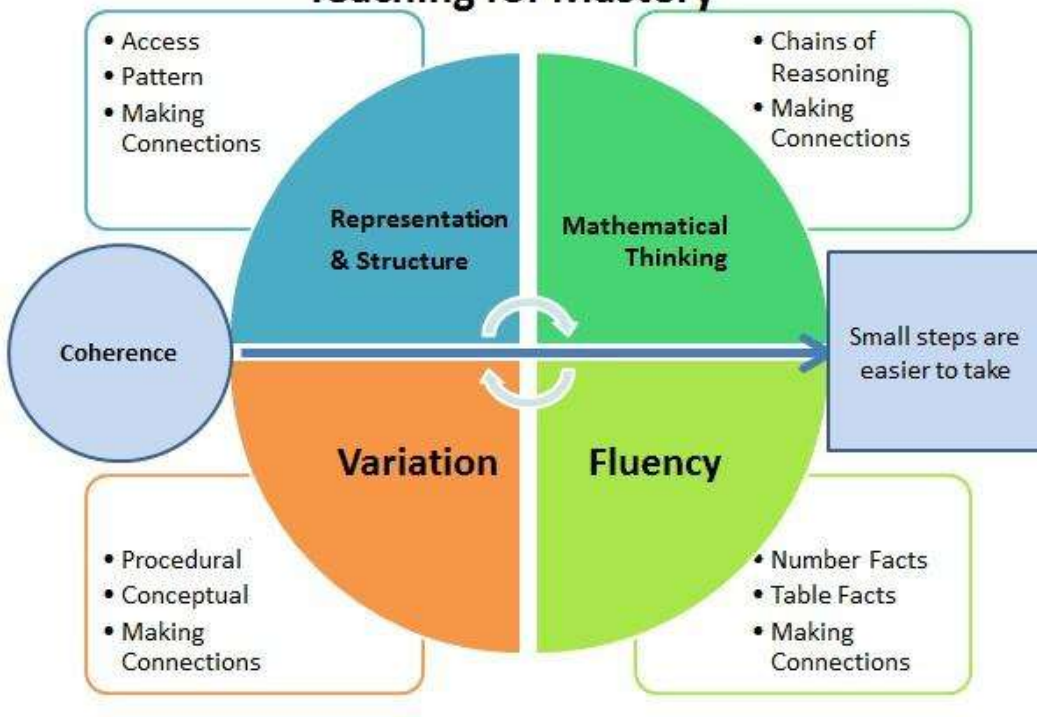
- Where did you come from?
- Where did you go?

Coherence!

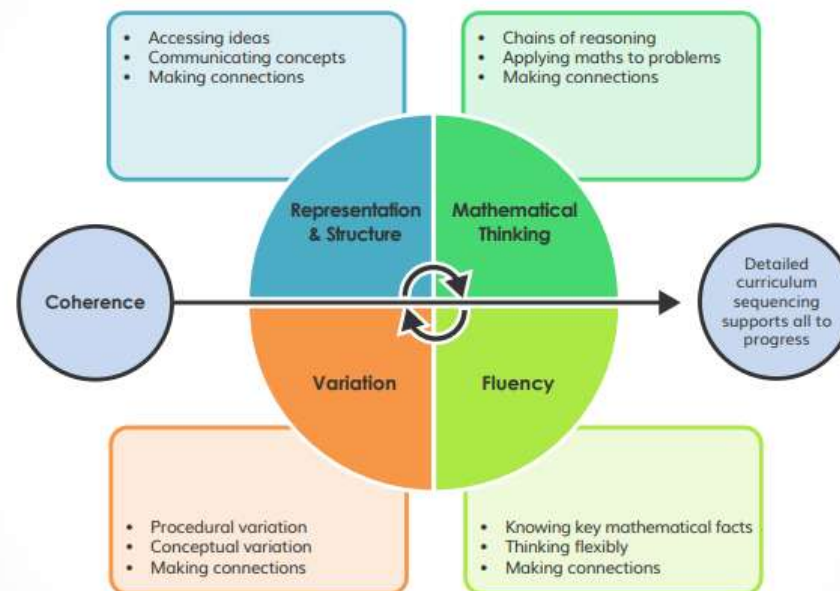


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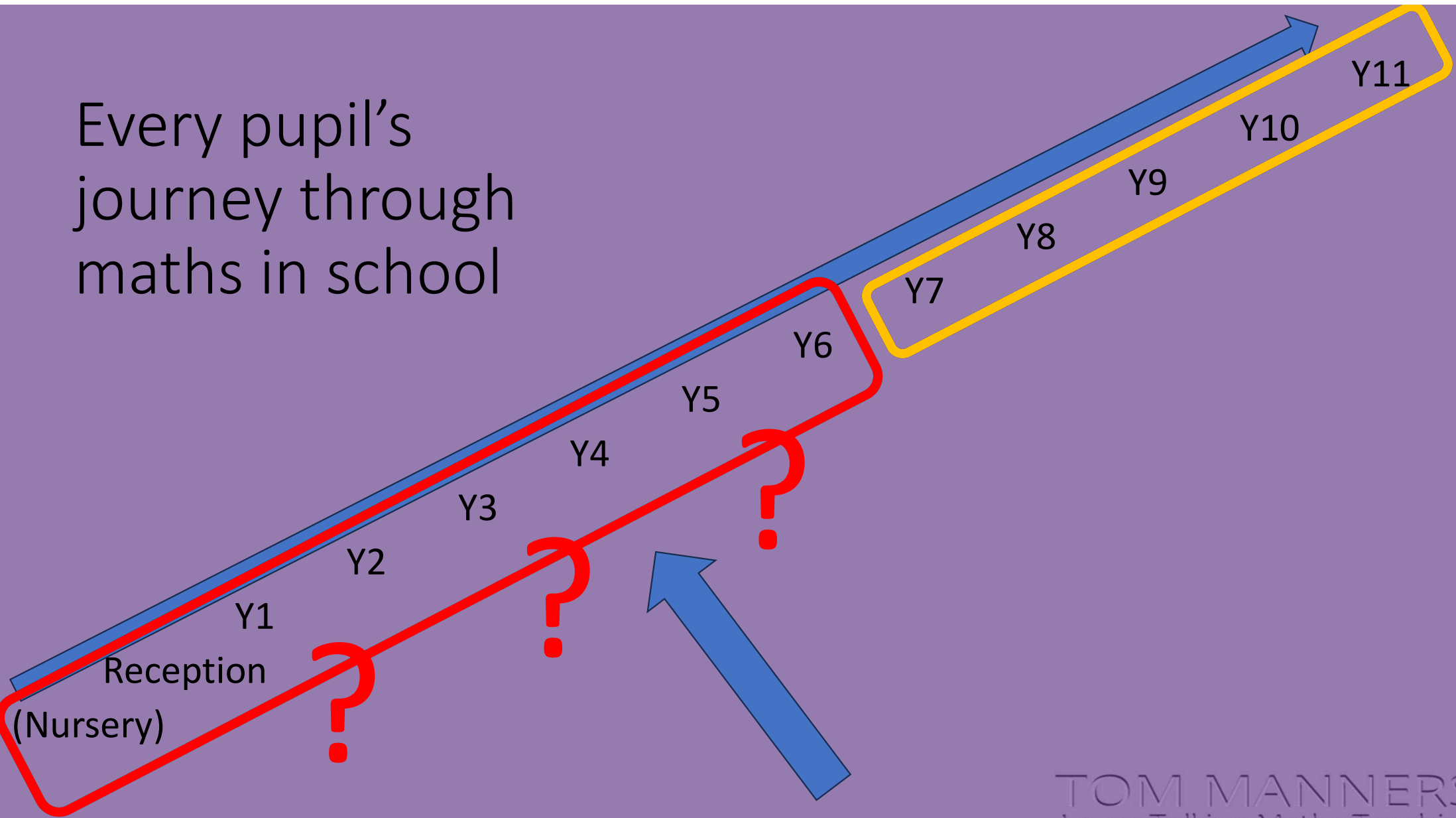
Teaching for Mastery



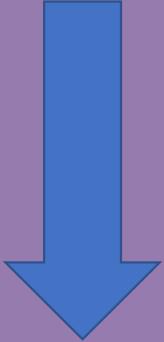
Teaching for Mastery Five Big Ideas



Every pupil's
journey through
maths in school

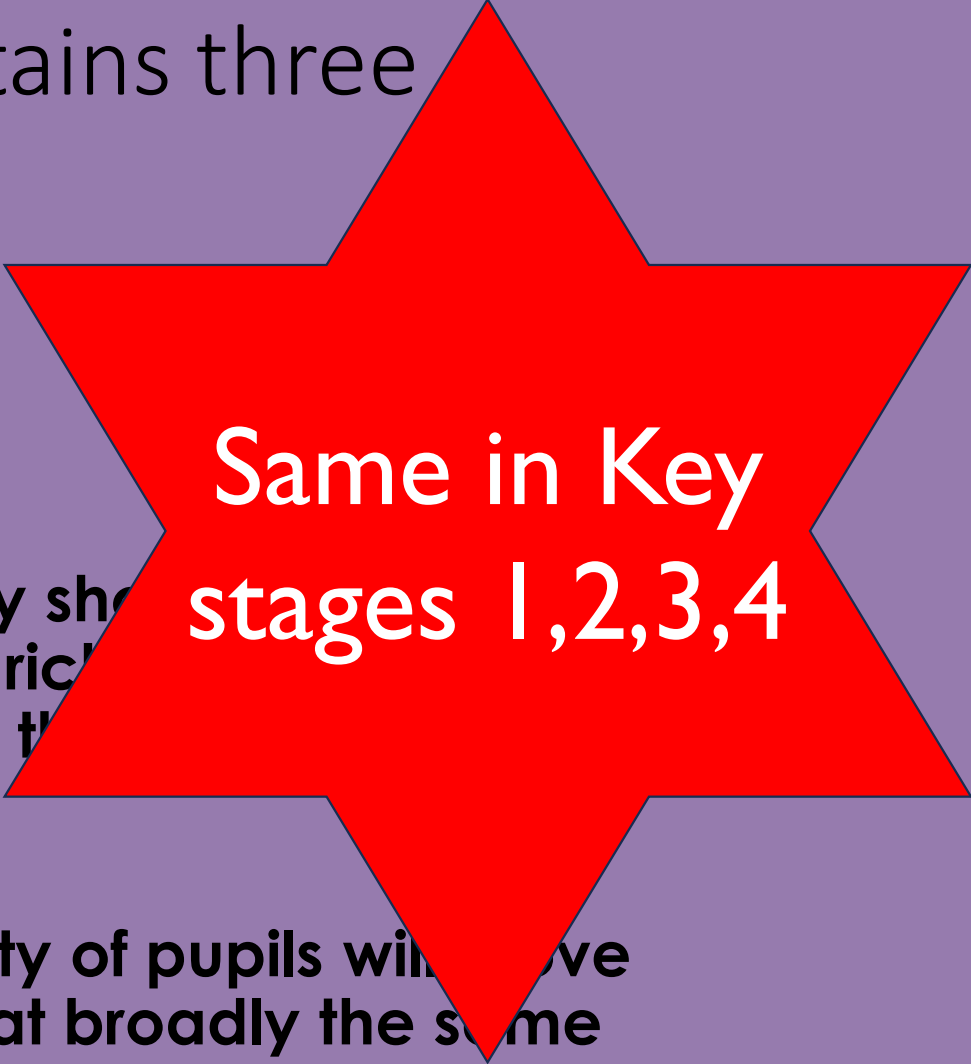


The National Curriculum contains three assessment objectives:

- 
- **Fluency**
 - **Reasoning**
 - **Problem solving**

“Pupils who grasp concepts rapidly should be challenged through being offered rich problems before any acceleration to new content.”

“The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace.”

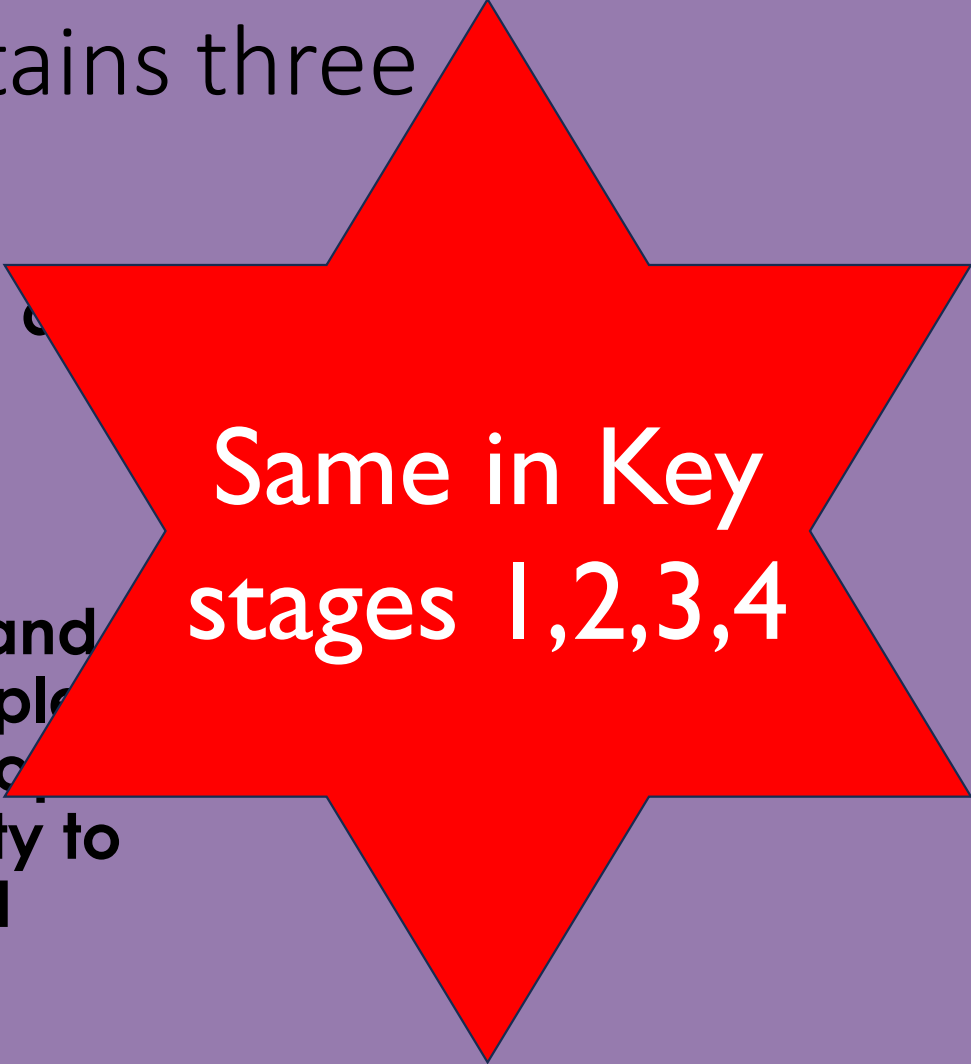


**Same in Key
stages 1,2,3,4**

The National Curriculum contains three assessment objectives:

The national curriculum for mathematics ensure that all pupils:

become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.



**Same in Key
stages 1,2,3,4**

The National Curriculum contains three assessment objectives:

The national curriculum for mathematics ensure that all pupils:

reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language

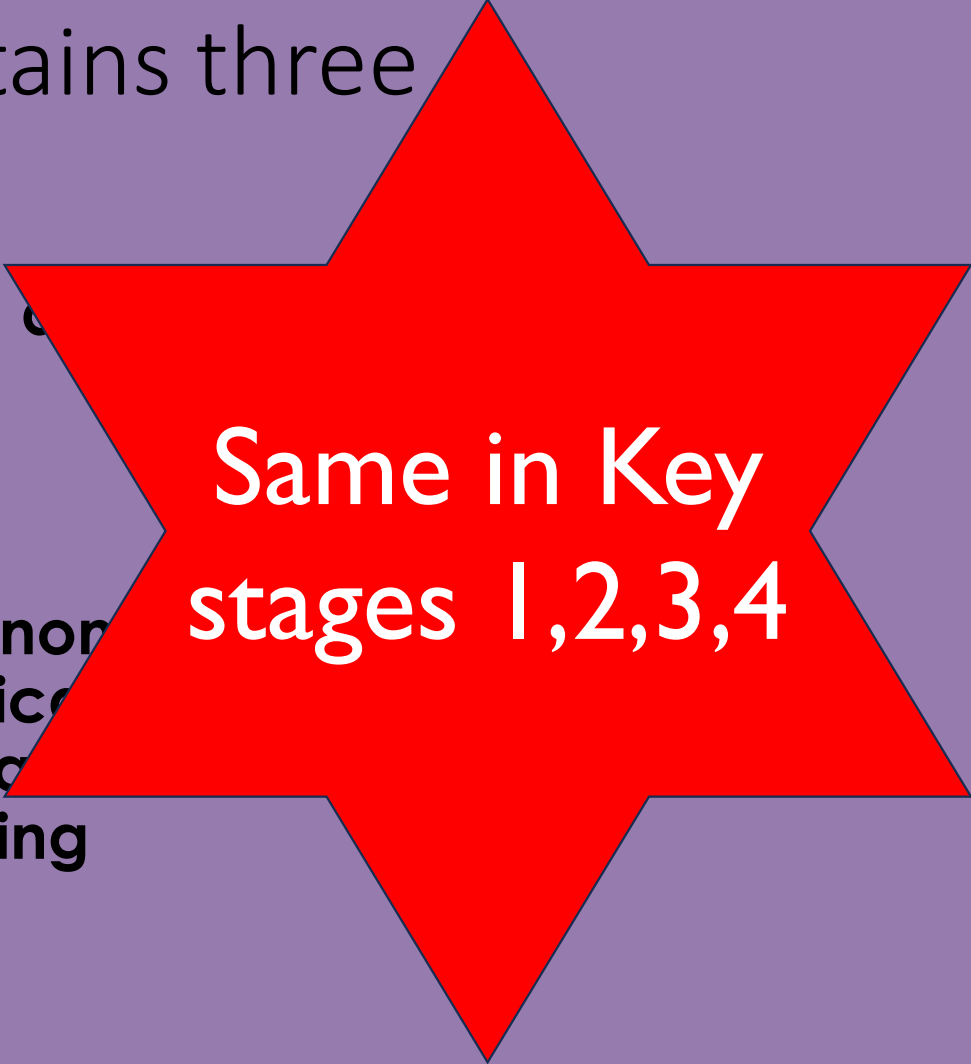
Same in Key
stages 1,2,3,4

THE ANSWER IS ONLY THE BEGINNING

The National Curriculum contains three assessment objectives:

The national curriculum for mathematics ensure that all pupils:

can solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions



**Same in Key
stages 1,2,3,4**

EYFS



Mathematics

ELG: Number

Children at the expected level of development will:

- Have a deep understanding of numbers to 10, including the composition of each number.
- Subitise (recognise quantities without counting) up to 5.
- Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.

ELG: Numerical Patterns

Children at the expected level of development will:

- Verbally count beyond 20, recognising the pattern of the counting system.
- Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.
- Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.

The composition of numbers 1 to 10



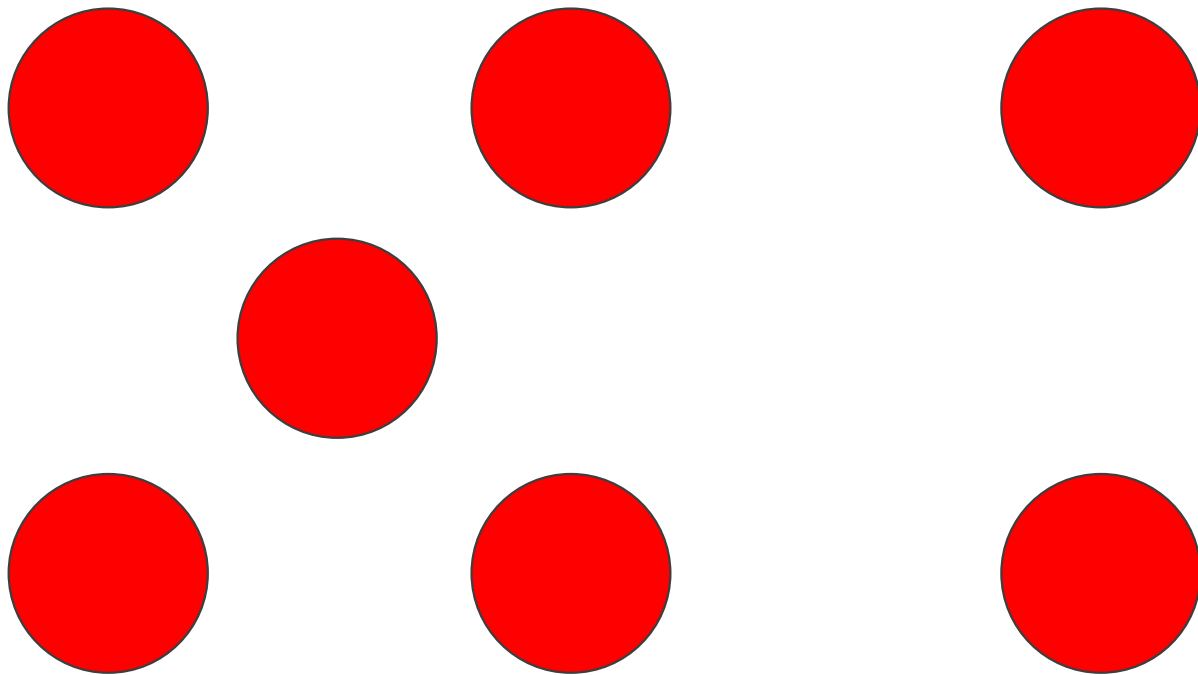
**Ofsted – “Coordinating Mathematical success.
The mathematics subject report” (2023)**

**Mastering Number
at Reception and
KS1**

Supporting pupils to develop good number sense

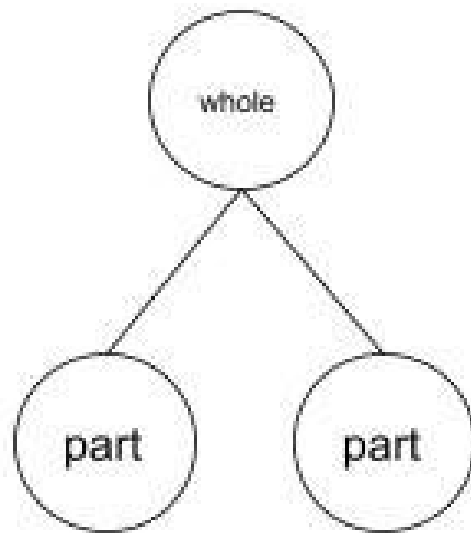
Other organisations should:

- extend the remit of Maths Hubs to make sure that most schools benefit from them
- offer the [Mastering Number programme](#) to all schools as an example of good practice in early mathematics

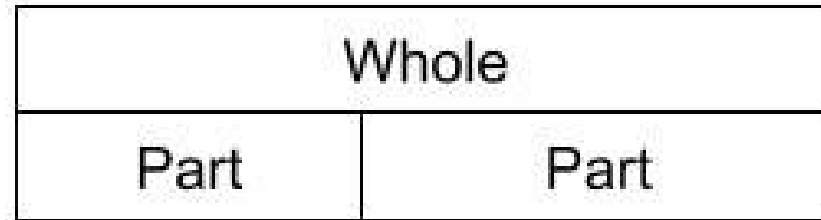


7

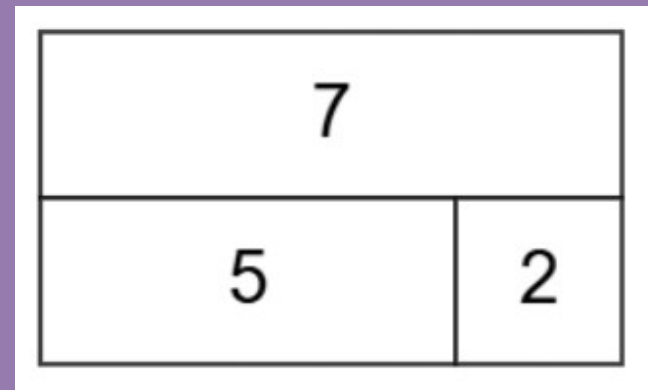
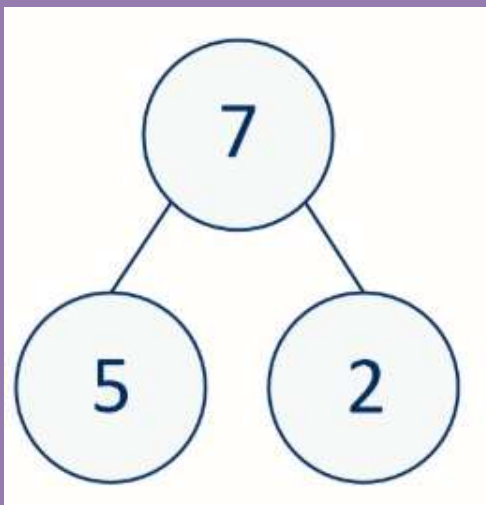
_____ is made of 5 and _____;
5 and _____ make _____.

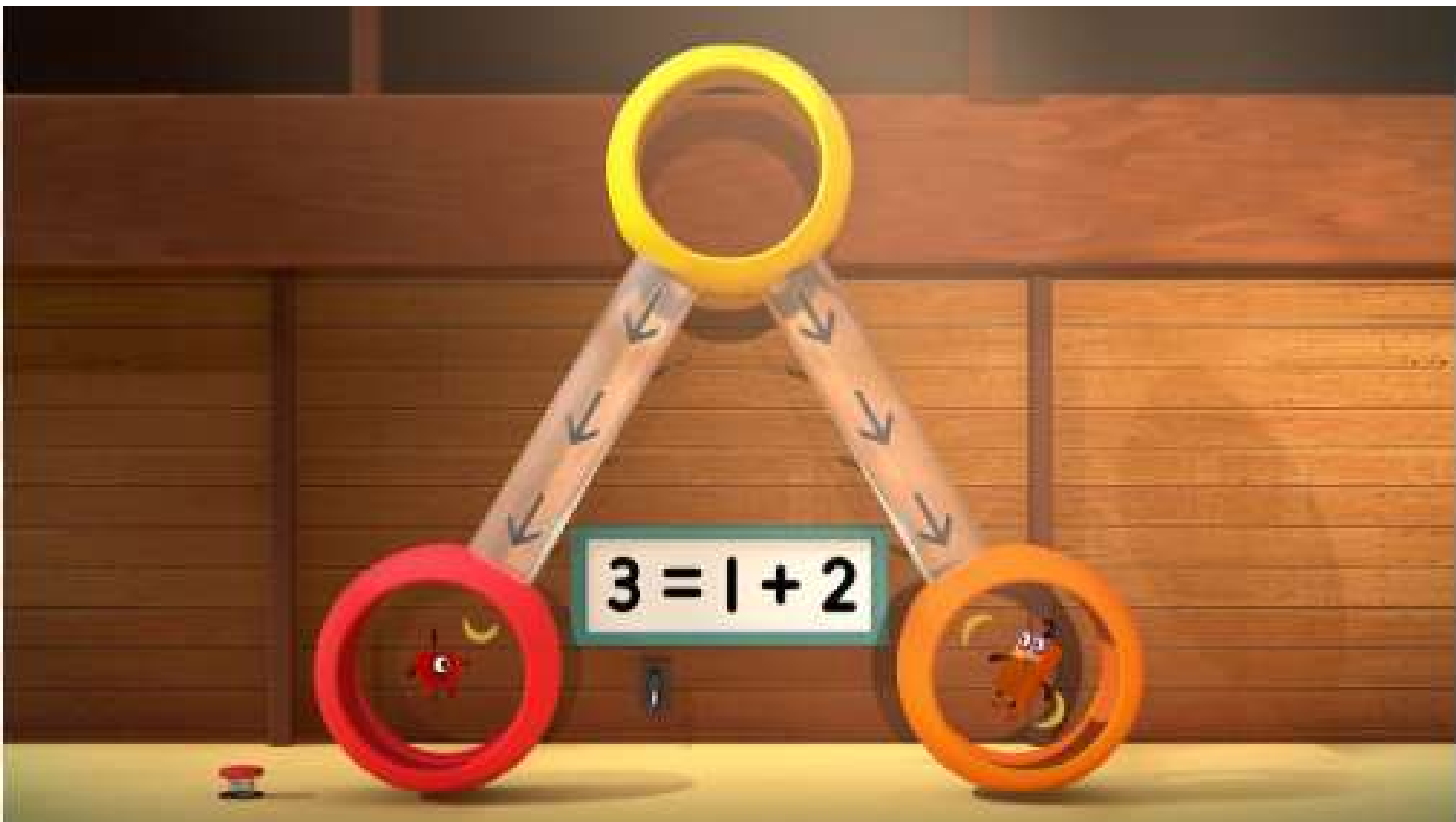


cherry diagram



Bar model





Addition and subtraction

Handwritten addition problem on lined paper:

$$17 + 5 = 22$$

The number 17 is circled. Below it, a tree diagram shows 17 as $20 - 3$. To the right, 5 is shown as $3 + 2$. The final result is $20 + 2 = 22$.

Handwritten subtraction problems on lined paper:

Problem 1: $12 - 7 = 5$. Tree diagram shows 12 as $20 - 8$ and 7 as $5 + 2$. The result is 5.

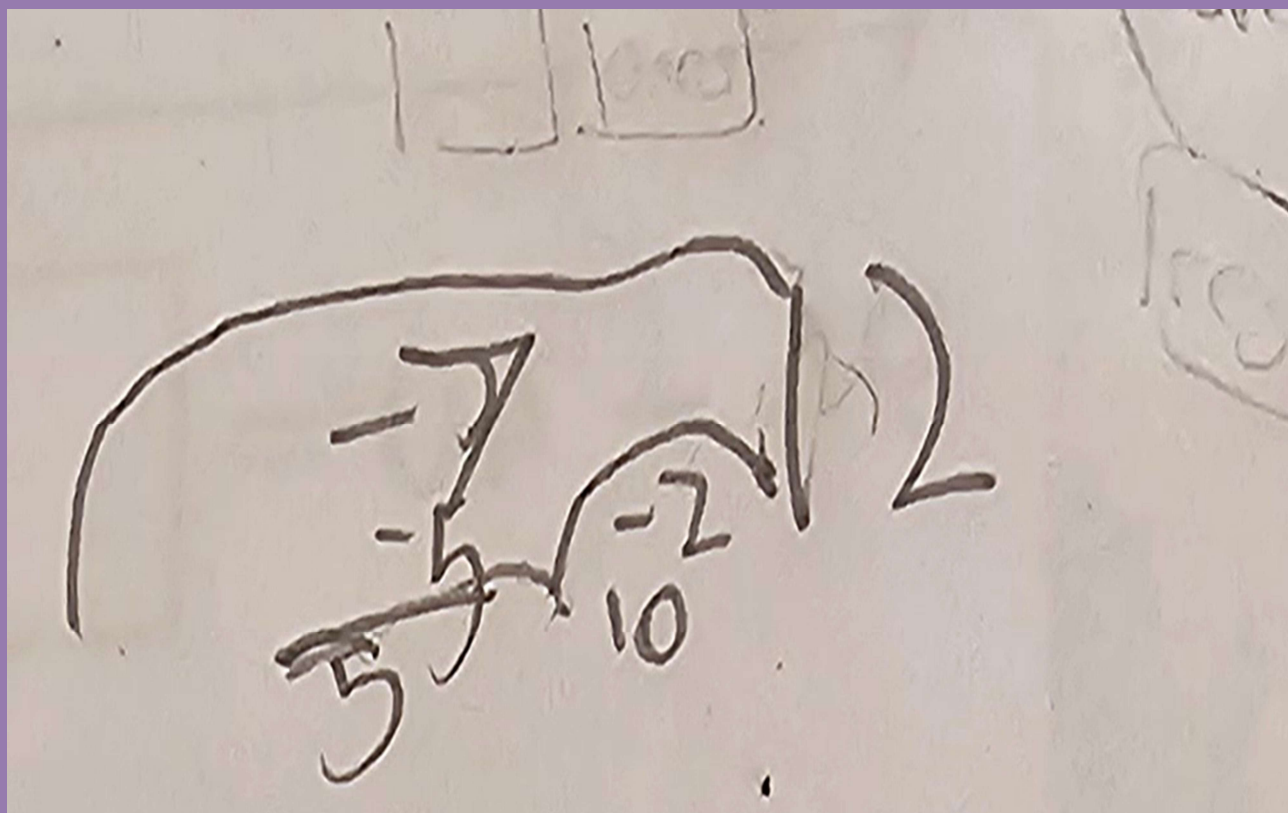
Problem 2: $15 - 8 = 7$. Tree diagram shows 15 as $20 - 5$ and 8 as $5 + 3$. The result is 7.

Problem 3: $13 - 5 = 8$. Tree diagram shows 13 as $20 - 7$ and 5 as $3 + 2$. The result is 8.

Problem 4: $13 - 6 = 7$. Tree diagram shows 13 as $20 - 7$ and 6 as $3 + 3$. The result is 7.

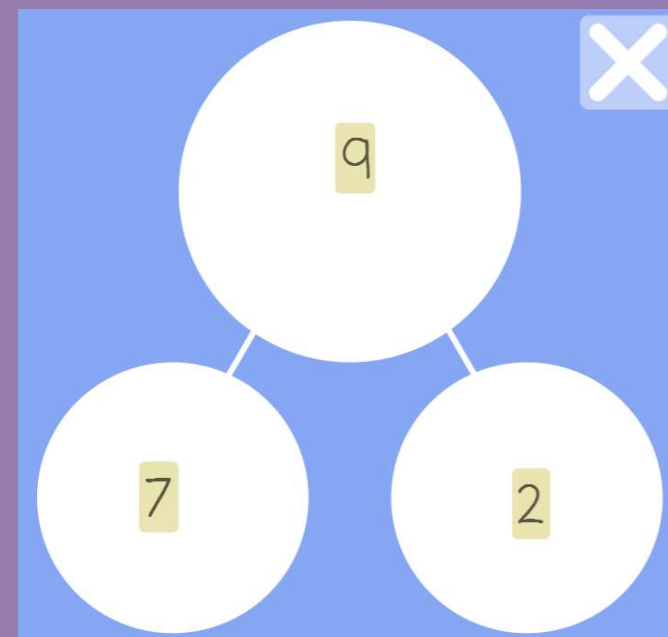
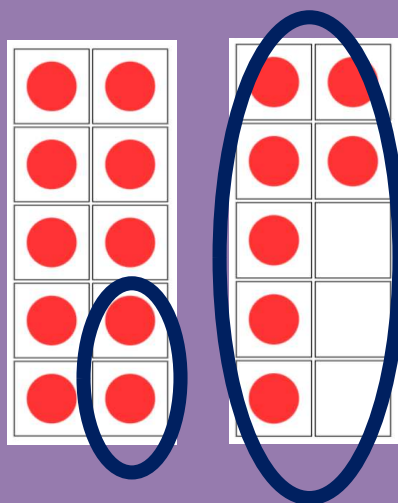
Number lines are also drawn for each problem, showing the subtraction process.

Addition and subtraction



Addition and Subtraction: 57-19

A handwritten subtraction problem on a grid background. The number 57 is written with a small '4' above the '5' and a '7' to the right. Below it is '19' with a horizontal line underneath. The '5' has a diagonal line through it, and the '7' has a small '7' to its right.

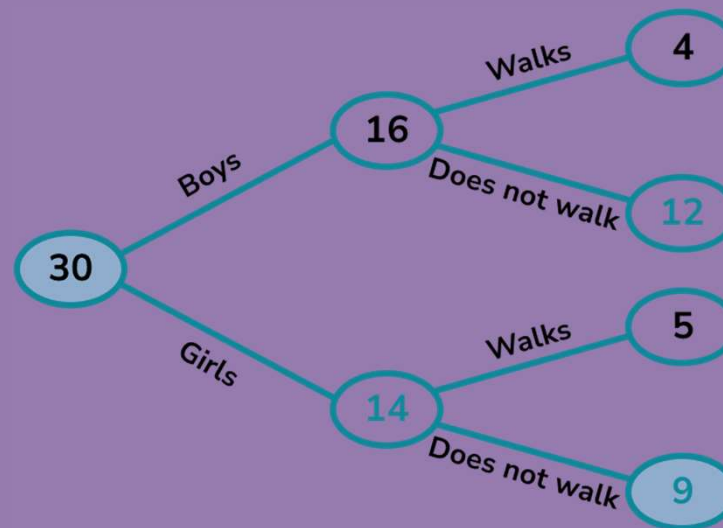


Anyone see a problem?

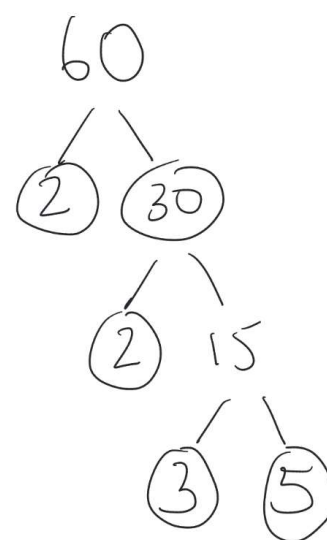
- Factor trees



- Frequency diagrams



Want a suggestion?

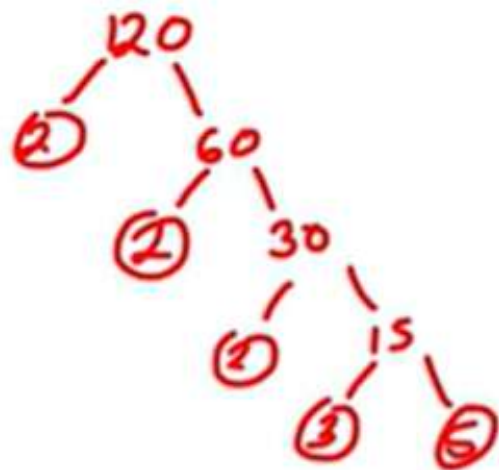


$$60 = \underline{2} \times 30$$

$$60 = \underline{2} \times \underline{2} \times 15$$

$$60 = \underline{2} \times \underline{2} \times \underline{3} \times \underline{5}$$

3 (a) Express 120 as a product of its prime factors.



2, 3, 5, 7, 11, 13 (2)

2,2,2,3,5



$$120 = 2 \times 2 \times 2 \times 3 \times 5$$

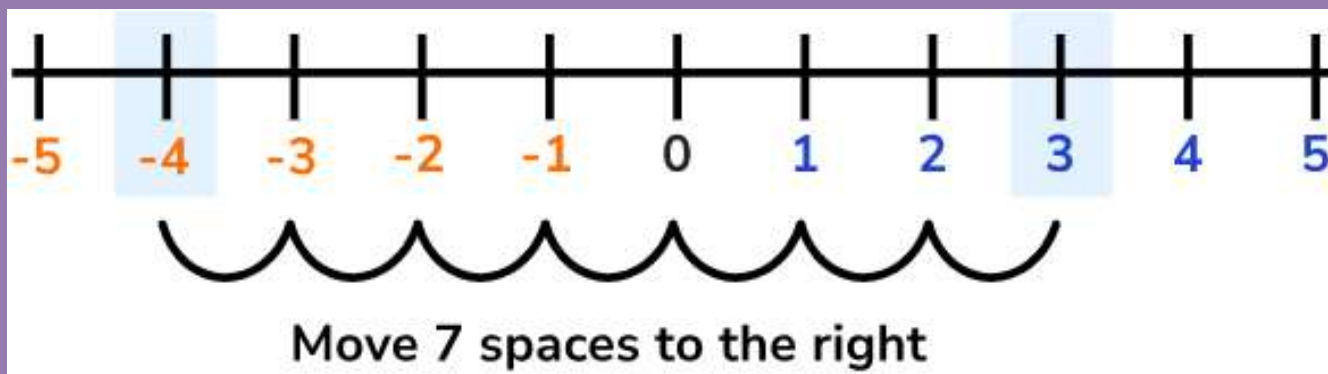
$$120 = \underline{2^3 \times 3 \times 5}$$

$$2+2+2+3+5 = 14$$

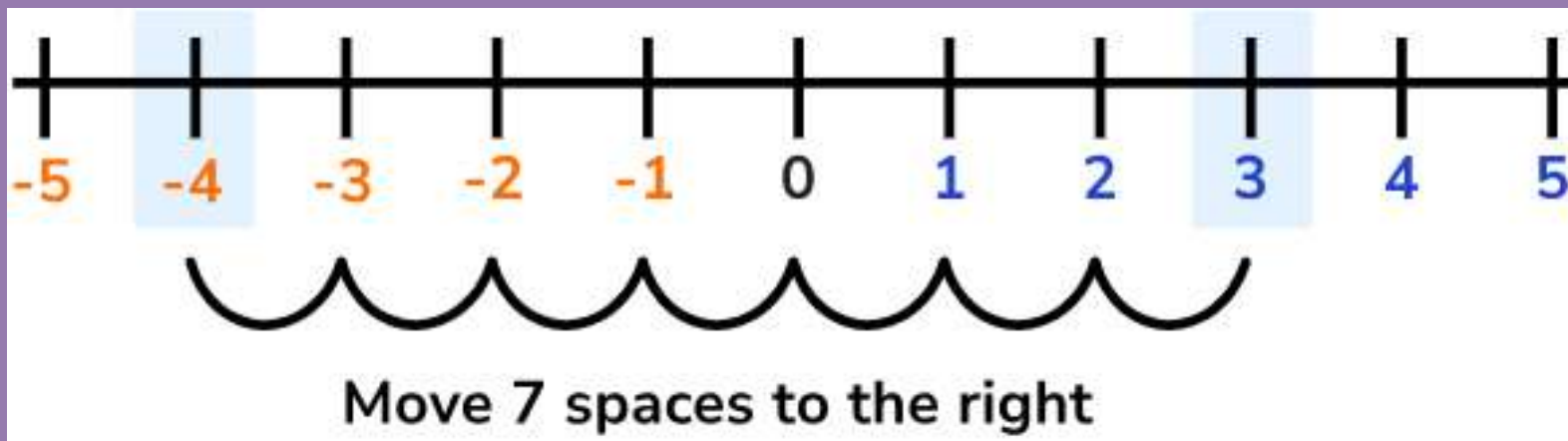


How else is knowing EYFS content useful?

- Adding and subtracting negatives
- e.g. $-4+7$



“Counting on” is not in the National Curriculum!



- “Counting on” requires substantial working memory resources, making it more cognitively demanding than strategies like partitioning, which involve breaking numbers into parts

Logie RH, Gilhooly KJ, Wynn V. Counting on working memory in arithmetic problem solving. *Mem Cognit.* 1994 Jul;22(4):395-410. doi: 10.3758/bf03200866. PMID: 7934946.

- Procedural strategies like “counting on” demand more from working memory than retrieval-based methods

Cragg L, Richardson S, Hubber PJ, Keeble S, Gilmore C. When is working memory important for arithmetic? The impact of strategy and age. *PLoS One.* 2017

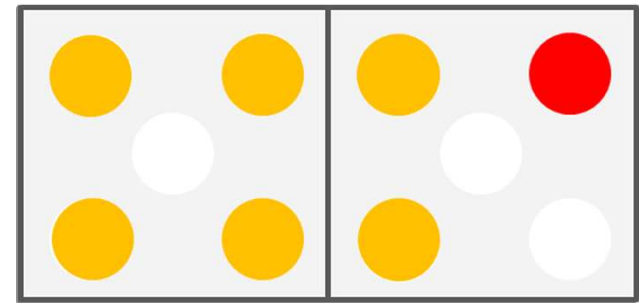
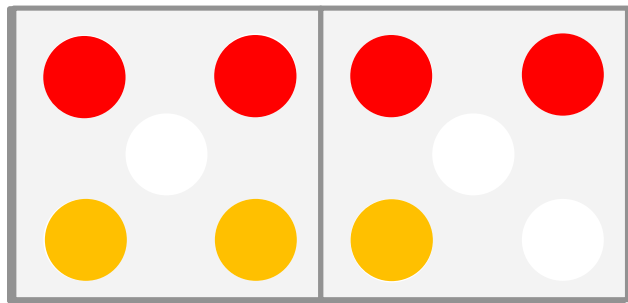
TOM MANNERS
Loves Talking Maths Teaching

It ain't what you do,
it's the way that you do
it

That's what gets results!

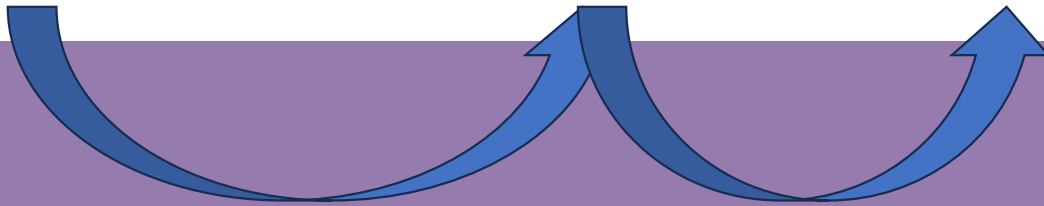
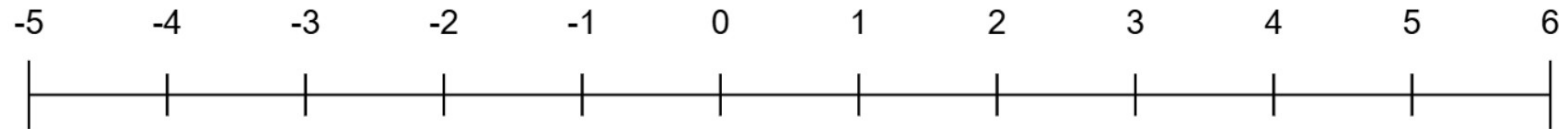


What is the same? What is different?

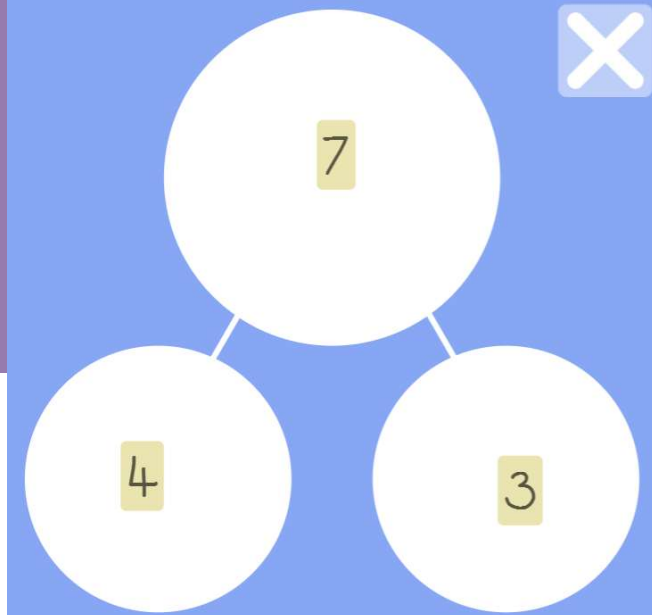


7 is made of ____ and ____;
____ and ____ make 7.

$$-4 + 7$$

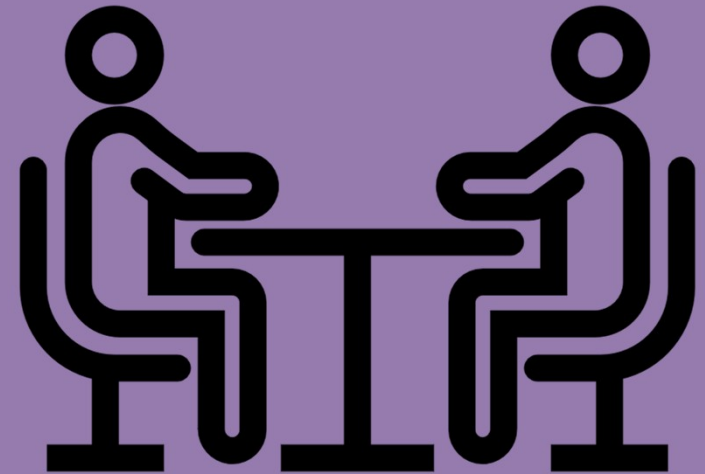


$$-4 + 7 = 3$$



Turn and talk – 20 seconds

- How do you know if a pupil gets the work right?
- How do you know if a pupil gets the work?



Scaffolds

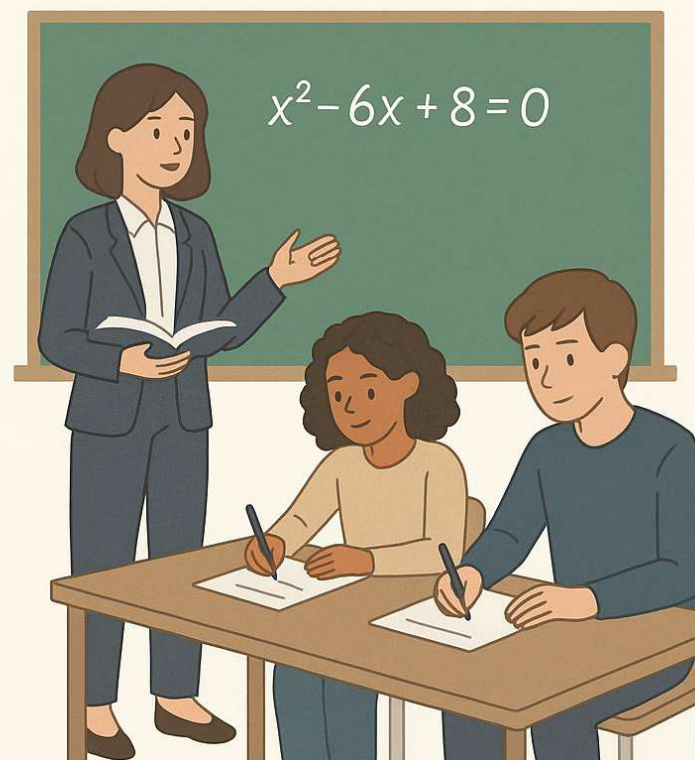
PRIMARY

Scaffolds in lessons



SECONDARY

Fewer scaffolds in lessons



Reasoning is more important

Reasoning is considered more important than knowledge of arithmetic when considering children's mathematics achievement (Nunes et al., 2009) and using reasoning in classrooms, encouraging conversations between teacher and pupil as well as pupil-to-pupil, is key for abstracting mathematical concepts (Sun, 2011; Hodgen and Wiliam, 2006).

- Nunes, T., Bryant, P., Sylva, K. and Barros, R. (2009) *Development of Maths Capabilities and Confidence in Primary School*. Oxford: Department for Children, Schools and Families.
- Sun, X. (2011) '"Variation problems" and their roles in the topic of fraction division in Chinese mathematics textbook examples', *Educational Studies in Mathematics*, 76(1), pp. 65-85. doi: 10.1007/s10649-010-9263-4.
- Hodgen, J. and Wiliam, D. (2006) *Mathematics inside the black box: assessment for learning in the mathematics classroom*. London: GL Assessment.

The evidence for the benefits of oracy for young people's learning and life chances is well established. According to the Education Endowment Foundation (EEF), oracy interventions lead to significant improvements in student outcomes.⁸⁷

We recommend that the Government:

- Introduces an oracy framework to support practice and to complement the existing frameworks for Reading and Writing.⁹⁴

THE
NCETM
MATHS
PODCAST

Episode 86



We need to talk: exploring the Oracy Commission Report

We speak to Geoff Barton to explore the Oracy Commission Report: We need to talk, and its significance for maths teaching

TOM MANNERS
Loves Talking Maths Teaching

Oracy!

- Oracy rich maths classrooms are important if we want all pupils to experience a coherent and connected maths curriculum.
- A 2014 study (Webb, N, et al., 2014) concluded that the best predictor of higher attainment in maths was engagement with the ideas of other students.
- Another study from 2021 elaborated on these findings, stating that dialogue and class participation in maths led to increased maths achievement for students not considered proficient.

Importance of mathematical language

Spoken language

The national curriculum for mathematics reflects the importance of spoken language in pupils' development across the whole curriculum – cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their mathematical vocabulary and presenting a mathematical justification, argument or proof. They must be assisted in making their thinking clear to themselves as well as others and teachers should ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions.



**Mathematics
programmes of study:
key stages 1 and 2**
National curriculum in England

September 2013



**Mathematics
programmes of study:
key stage 3**
National curriculum in England

September 2013

Importance of mathematical language

Question:

On Monday, Jacob had 24 sweets and he shared them with 8 friends.

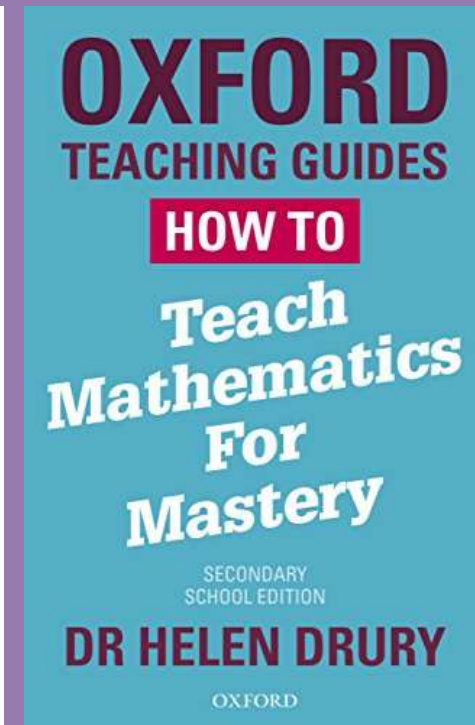
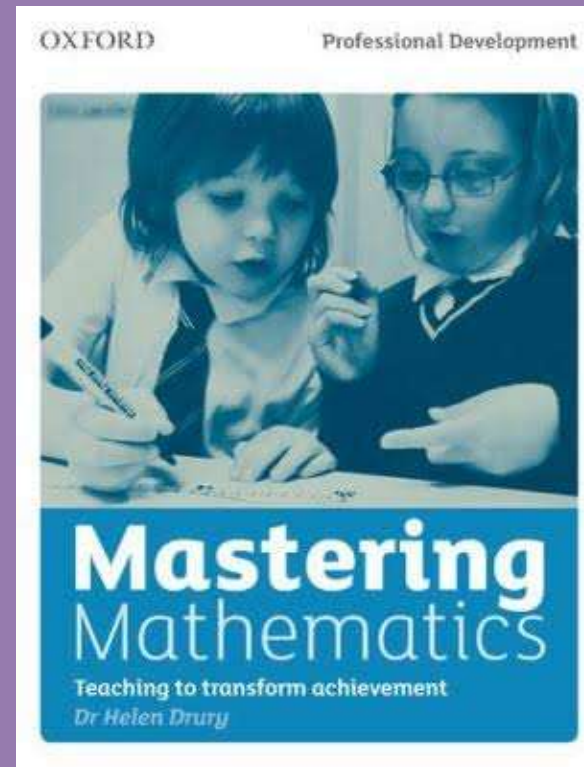
On Tuesday, he again had 24 sweets and shared them with 6 friends.

From Monday to the Tuesday, did each friend receive more or fewer sweets?

Addend + Addend = Sum		
Minuend	- Subtrahend	= Difference
Factor x Factor = Product		
Product ÷ Factor = Factor		
Divisor $\overline{)$ Dividend Quotient		

Language and communication

“...becoming able to articulate mathematical ideas, concepts and reasoning has a profound effect on the way that pupils see themselves”



Lee, C (1998) Discussion in a mathematics classroom: Developing a teacher's awareness of the issues and characteristics. Oxford: Centre for research into mathematics education

Key Messages

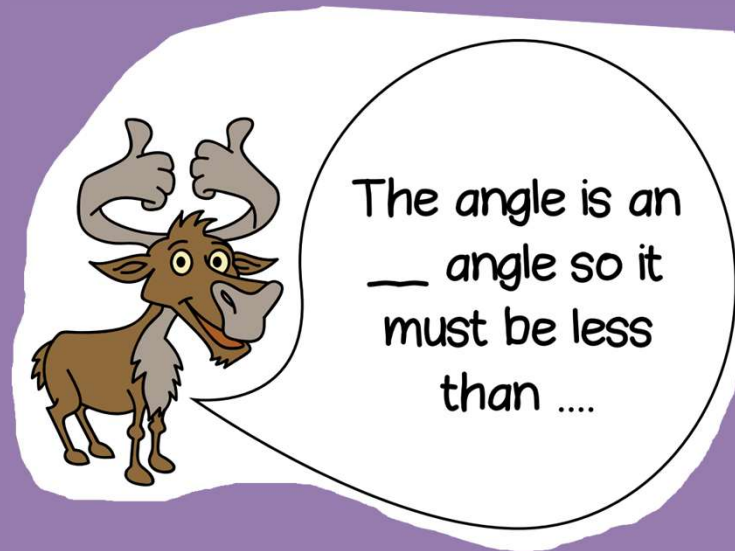
1. The representation needs to clearly show the concept being taught, and in particular the key difficulty point. **It exposes the structure.**
2. In the end, the **students need to be able to do the maths without the representation.**
3. *A stem sentence describes the representation and helps the students move to working in the abstract (“ten tenths is equivalent to one whole”) and could be seen as a representation in itself.*
4. There will be some key representations which the students will meet time and again.
5. **Pattern and structure are related but different:** students may have seen a pattern without understanding the structure which causes that pattern.

Stem sentences

7 is made of ____ and ____;
____ and ____ make 7.



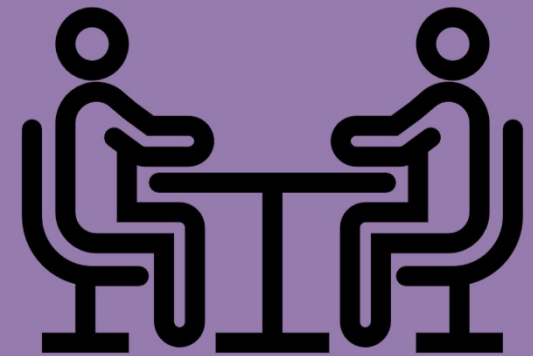
Sentence starters



Stem sentences

Stem sentences

- Why are stem sentences and sentence starters so important?
- Sentence starters and stems are crucial for academic success because they provide structure, support language development, and promote clear communication.
- They help students organize their thoughts, express ideas with precision, and engage with more complex language structures, especially in writing and mathematical discussions

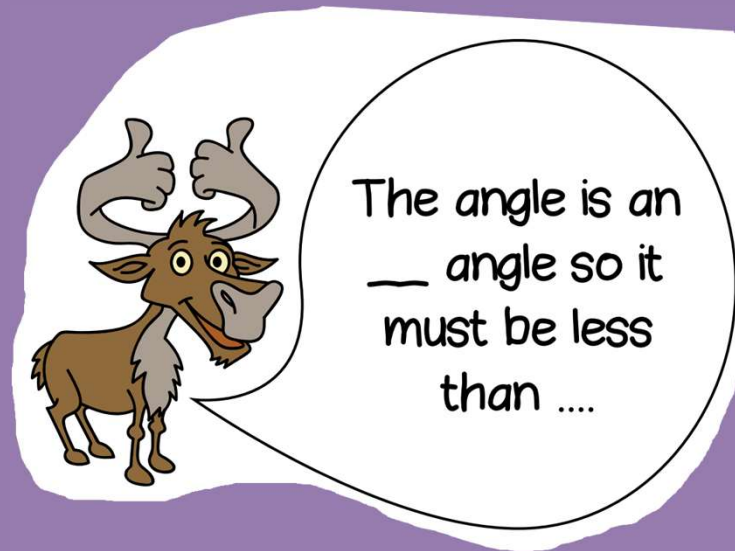


Stem sentences

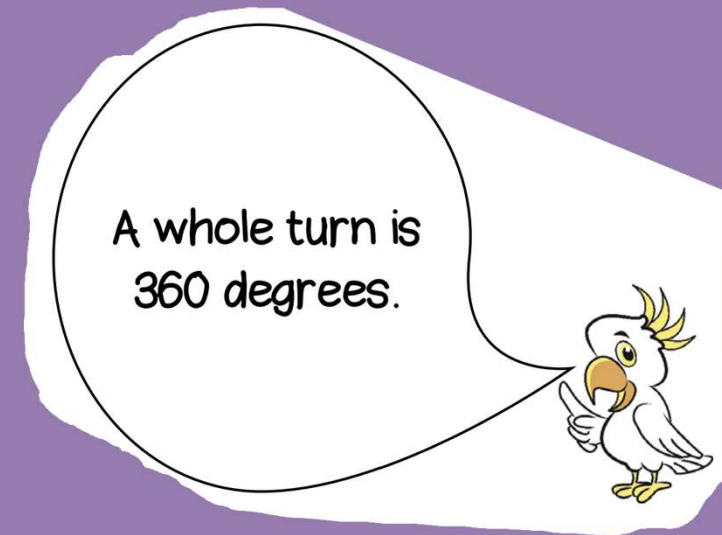
7 is made of ____ and ____;
____ and ____ make 7.



Sentence starters



Stem sentences



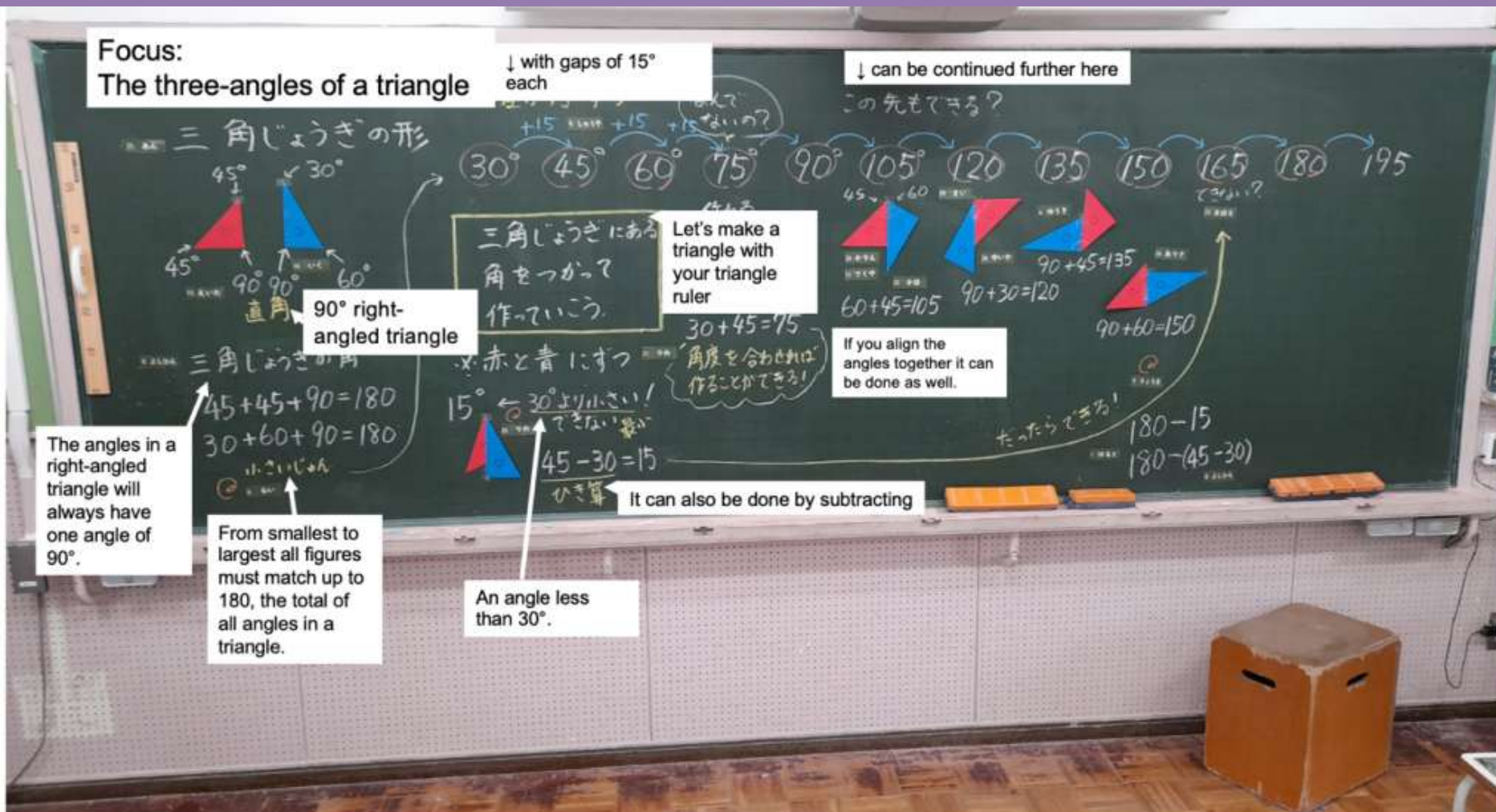
Generalisations

Generalising

“A lesson without the opportunity for learners to generalise (mathematically) is not a mathematics lesson”

Mason, 1996

Generalising



<https://blogs.nottingham.ac.uk/primaryeducationnetwork/2025/05/02/crafting-mathematical-journeys-for-children-the-power-of-board-work/>

Maths

Key Vocabulary

- ones
- tens
- hundreds
- partition
- regroup
- sum
- remainder
- exchange
- dividend
- divisor
- product
- regroup

Divide a 3 digit number by a 1 digit number using place value.

$$\begin{array}{r} \text{HTO} \\ 250 \\ : 5 \\ \hline 50 \\ 0 \\ \hline \end{array}$$

Use partitioning to divide by a 1 digit number.

$$30 \div 3 = 10$$

$$12 \div 3 = 4$$

$$10 + 4 = 14$$

Divide near multiples by 2, 3, 4, 5, 8, 10 with remainders.

$$25 \div 5 = 5 \text{ r } 1$$

Multiply 2 digit numbers by 10 using place value.

$$\begin{array}{r} \text{HTO} \\ 23 \times 10 \\ \hline 230 \end{array}$$

$$\begin{array}{r} \text{HTO} \\ 47 \times 10 \\ \hline 470 \end{array}$$

Use distributive law to multiply a tens number by a 1 digit number.

$$19 \times 3 = 30 + 27 = 57$$

Multiply 2-digit by a 1-digit number using a formal written method (multiple columns).

$$\begin{array}{r} \text{HTO} \\ 42 \\ \times 9 \\ \hline 378 \end{array}$$

Multiply 2-digit number by a 1-digit number using a formal written method (regroup ones).

$$\begin{array}{r} \text{HTO} \\ 23 \\ \times 4 \\ \hline 92 \end{array}$$

Multiplication and division

If I know... then I also know...

I partition _ teen into 1 ten and _ ones then I multiply...

The remainder is always less than the divisor.

If the column product is equal to 10 or more then I regroup and...

When you divide a number by ten it gets ten times smaller so the digits move one column to the right.

When you multiply a number by ten it gets ten times larger so the digits move one column to the left.

If the dividend is not a multiple of the divisor, there is a remainder.

When I multiply by _ it is the same as multiplying by _ then by 10.

If I know... then I also know...

I partition _ into _ tens and _ ones then I multiply...

If the column product is equal to 10 or more then I regroup and write the ones digit here and the tens digit here.

How to include more oracy in your lessons

- Sentence stems
- Generalised sentences
- More representation (a picture paints a thousand words!)

Manipulative usage across phases

Compelling evidence of a marked decline in the use of manipulatives as pupils transition from primary to secondary mathematics classrooms in England.... despite evidence that they can enhance conceptual understanding and oracy at all ages.

Charles-Cole, V. (2017). A study of children's attitudes towards using concrete resources in mathematics in Year 6 and in Year 7. Unpublished doctoral dissertation, UCL Institute of Education.

TOM MANNERS
Loves Talking Maths Teaching

How to include more oracy in your lessons

- Sentence stems
- Generalised sentences
- More representation (a picture paints a thousand words!)
- Before the I do, show an example of a question you're about to present and ask:
 - “What’s the same, what’s different?” (Comparing the question to the previous day’s learning)
 - “What do you already know, what don’t you already know?”
- Before the we do, allow pupils to “write pair share” before facilitating
- Open questions
 - “How did you know to do that?”
 - “Convince me”
 - “What do you notice? What do you wonder?”

What do you notice? What do you wonder?

Tom Manners reflects on the power of prompts to support the development of conceptual understanding.



by St. Matthew's Research School
on the 2nd April 2025

Share on: [f](#) [X](#) [✉](#) [📄](#)



Tom Manners

Evidence Lead in Education

Tom Manners is a PGCE tutor for Arthur Terry Teaching School Hub. He is also an accredited PD Lead for NCETM, whom he represents as a Teaching for Mastery Specialist.

<https://researchschool.org.uk/stmatters/news/news/what-do-you-notice-what-do-you-wonder>

TOM MANNERS
Loves Talking Maths Teaching

Oracy!

A significantly higher proportion of primary teachers feel discussing and building upon ideas in pairs or groups and sharing ideas verbally during class discussions are ‘very important’ in developing oracy, in comparison with secondary teachers.

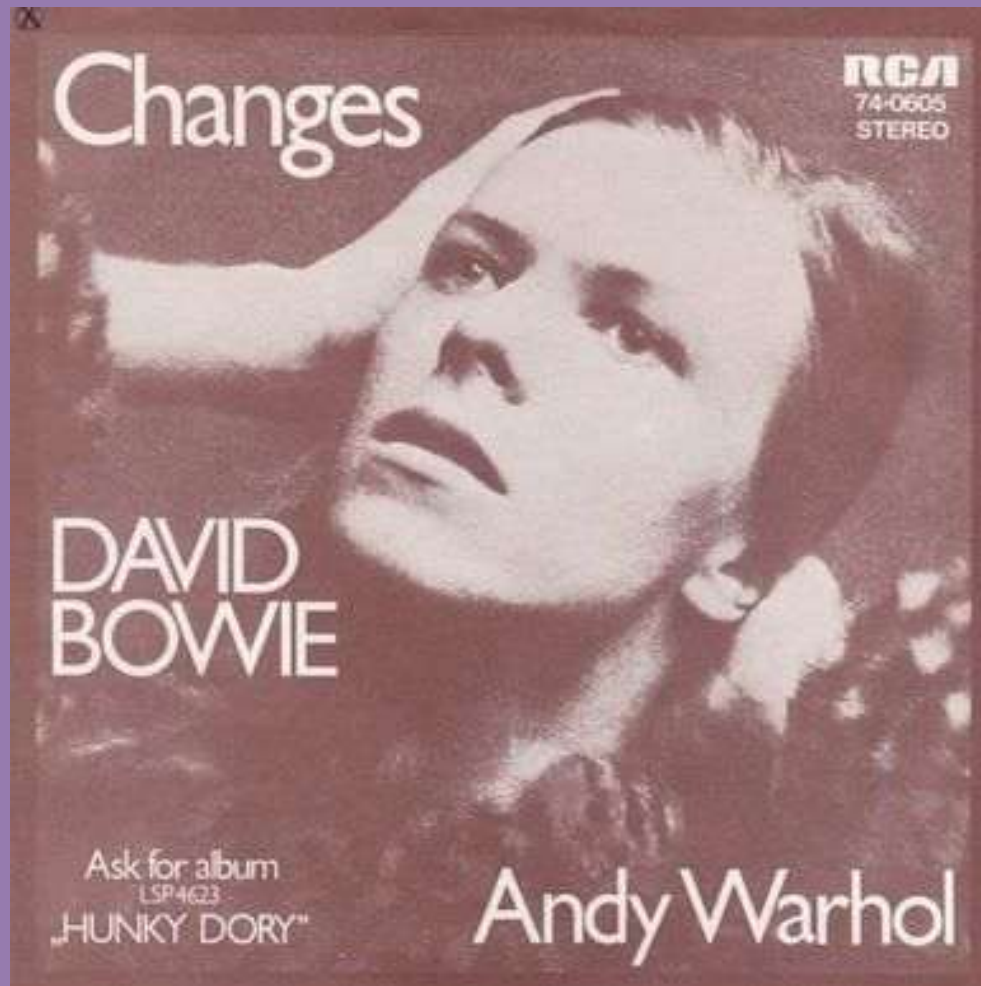
“It’s not the product it’s the process,
[and] if you get the process right, the
product will be right”

Jan Carrier, Eastwood Primary School

“You can make more mistakes in your
discussion of an idea than you’d be
prepared to make on a piece of paper”

Rachel Forward, King Edward VI School

[https://cfey.org/
wp-
content/uploads/
2016/11/Oracy-
Report-Final.pdf](https://cfey.org/wp-content/uploads/2016/11/Oracy-Report-Final.pdf)



Turn and face the
strange

Ch-ch-changes



So what are schools doing?

Etone College

Treble success for Etone

We are proud to announce that Etone are in the running for three h
The categories that we are hoping to be successful for are:

School of the Year

Headteacher of the Year – Mr Smith

Lifetime Achievement Awards – Mrs Stafford



Loves Talking Maths Teaching

I can't do Maths...yet!

How to minimise gaps in recall impacting on future learning. Written by guest blogger, Neil Randall from Etone College.

<https://researchschool.org.uk/staffordshire/news/i-cant-do-maths-yet>

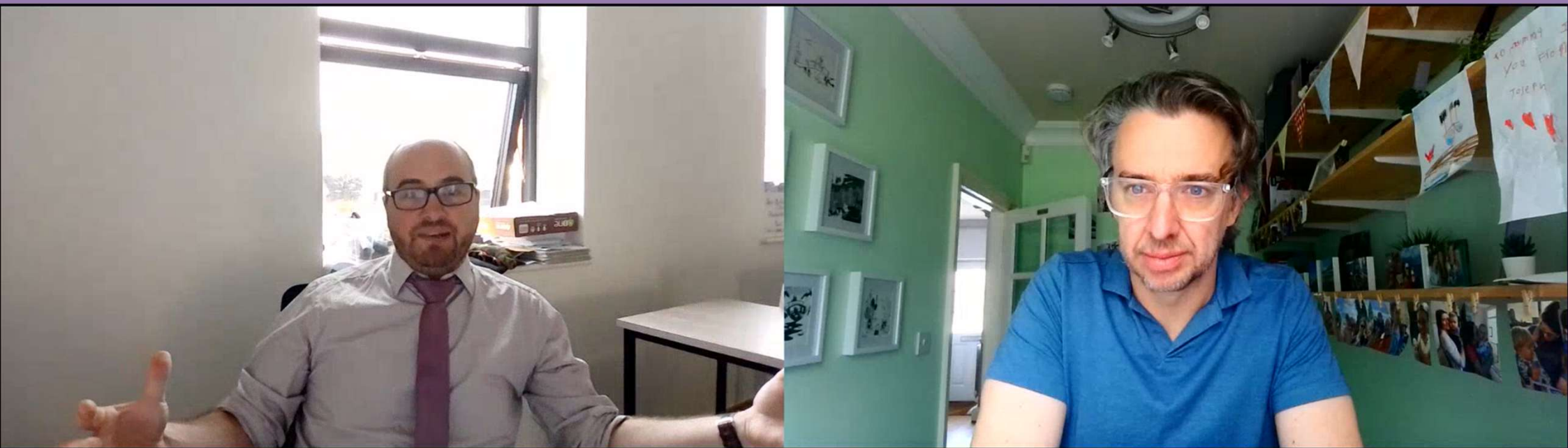
Neil is currently Director of Maths at Etone College, a large successful and over-subscribed comprehensive school in Nuneaton. Having previously had roles as Second in Department and Key Stage 3 Lead, Neil has developed expertise in curriculum planning and approaches to teaching Maths.

As KS3 Lead he led curriculum change to improve pupil outcomes building in a mastery focus by carefully considering guidance from the NCETM. He works closely with primary schools to ensure that the curriculum continues to adapt to pupil needs and effectively build on prior learning.

Neil has contributed to an EEF project on worked examples and previously written a blog about how they can be used to promote mathematical talk. Neil has worked as a mentor for SCITT and FTS, as well as ECTs, believing passionately that delegated curriculum is fundamental to teacher development and progression. Neil has completed NPQLTD and is currently working towards his NPQSL.



Neil chatting to me earlier this week!



TOM MANNERS
Loves Talking Maths Teaching

Etone College –Neil Randall (Director of Maths)

Neil's underlying philosophy

- Everything ultimately came back to one goal: “Pupils should leave Year 11 enjoying mathematics.”

Because of that belief:

- Year 7 matters enormously.
- Transition is about understanding children rather than simply receiving data.
- Primary and secondary teachers should see themselves as partners in one learning journey.
- Success comes from coherent curriculum, respectful collaboration and shared ambition, rather than repeating content.

Etone College –Neil Randall (Director of Maths)

Transition is about curriculum, not just pastoral induction

Neil's central message is that transition is about understanding:

- where pupils have come from
- how they have been taught
- what they need next
- where they are ultimately heading (GCSE)
- His view was that Year 7 should not be seen as a fresh curriculum beginning but as one stage in a continuous learning journey.

Etone College –Neil Randall (Director of Maths)

Regular conversations with feeder primary schools

- Rather than relying on SATs data alone, Etone holds discussions with the maths leads (or phase leaders) from key feeder schools.

These conversations focus on:

- strengths and weaknesses of the cohort
- topics that required additional teaching time
- mathematical misconceptions
- learning behaviours
- curriculum adaptations made during Year 6
- areas pupils are particularly confident or less secure in

Neil argued these conversations provide far richer information than SATs outcomes, because SATs only show the final result—not the story behind it.

Etone College –Neil Randall (Director of Maths)

Higher Prior Attainer (HPA) sessions

One of the main transition projects is a programme for higher-attaining pupils.

Typically:

- around 15 pupils
- two or three sessions with each main feeder school
- sometimes delivered at the primary school
- sometimes pupils visit Etone

The sessions include:

- challenging calculations ,missing-number problems, BIDMAS , treasure hunts , unfamiliar notation, rich problem solving, relay activities, mathematical discussion

Importantly, the sessions deliberately include problems pupils cannot already solve, so they experience genuine mathematical thinking rather than simply being "the clever ones."

Etone College –Neil Randall (Director of Maths)

Building excitement about secondary maths

The HPA sessions are deliberately designed to make secondary mathematics feel exciting.

Benefits include:

- pupils meet secondary teachers before arriving
- they visit classrooms
- they experience the school positively
- they receive small treats (drink/snack)
- they begin seeing secondary teachers as approachable

Neil felt this helped reduce anxiety while building enthusiasm for mathematics.

Etone College –Neil Randall (Director of Maths)

Horizon knowledge

Primary teachers are helped to understand: "Where does this learning go next?"

Examples included:

- Factors → Highest Common Factor / Lowest Common Multiple
- Coordinates → Straight-line graphs → Non-linear graphs

The message is that primary teaching should prepare pupils for Year 7 rather than simply finish Year 6.

Etone College –Neil Randall (Director of Maths)

Using Oak Academy to show progression

Because Etone and Oak Academy follow the non-statutory guidance, Neil uses Oak's resources with feeder schools to demonstrate the curriculum journey.

Primary colleagues can see:

- what comes next
- how concepts develop
- resources illustrating Year 7 learning

It is not about asking primaries to teach Year 7 work. Instead it gives teachers confidence that what they teach now has a clear future purpose.

Etone College –Neil Randall (Director of Maths)

Respecting primary methods

Etone deliberately avoids dismissing primary approaches. Instead they:

- understand the methods pupils have learned
- recognise why those methods were taught
- introduce new methods carefully
- compare methods
- explain why a different approach may become useful later

The emphasis is on building from prior learning rather than replacing it.

Etone College –Neil Randall (Director of Maths)

Understanding pedagogy

Neil regularly looks at primary schools' published calculation policies and methods.

This allows teachers to:

- understand pupils' prior experiences
- make explicit links
- avoid telling pupils their previous methods were "wrong"

Etone College –Neil Randall (Director of Maths)

Relationships matter

Neil repeatedly returned to the importance of relationships.

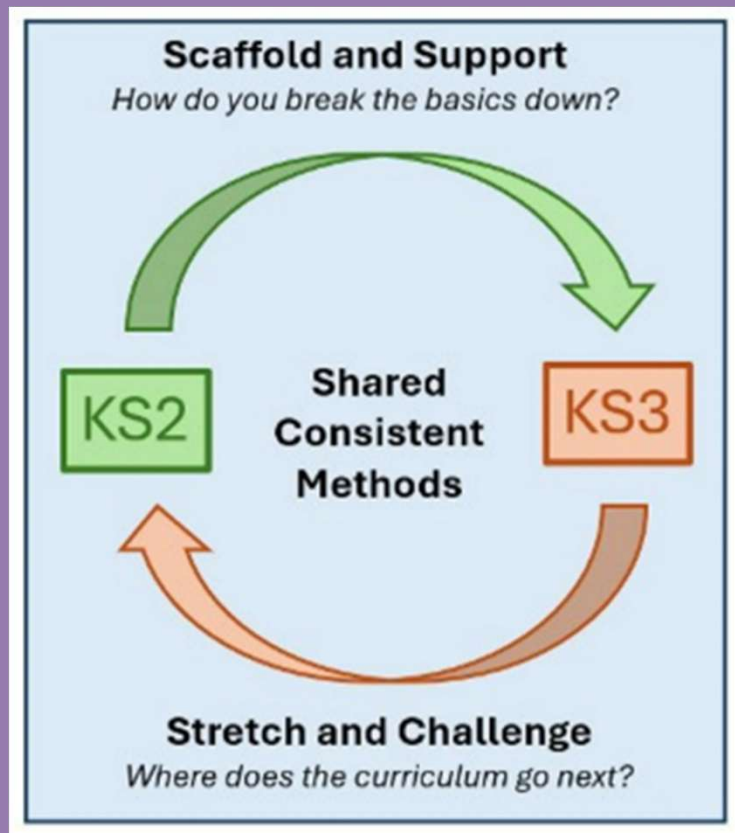
- Teachers know feeder schools.
- Primary staff know secondary staff.
- Children know secondary teachers before September.

Transition therefore becomes based on trust rather than simply information transfer.

I can't do Maths...yet!

How to minimise gaps in recall impacting on future learning. Written by guest blogger, Neil Randall from Etone College.

<https://researchschool.org.uk/staffordshire/news/i-cant-do-maths-yet>



TOM MANNERS
Loves Talking Maths Teaching

ATLP project

- Mixed trust of 6 secondary and 17 primaries

Tom's Substack

"Disrespectful"

Blog #2 - Blog Series: Improving the Transition in Maths Between Key Stage 2 and 3.



.....
Together we are stronger
.....



ATLP Primary “Best maths work” project -
2025

For the teacher

atlp.org.uk

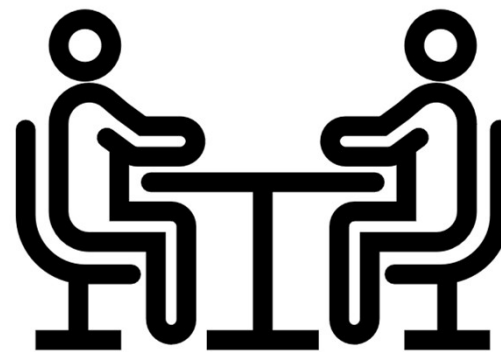
ATLP Year 6 to 7 transition – “Best work” project The “HOW”

- It has been proposed that all ATLP primaries should send a piece of ‘best maths work’ to the secondary schools that their pupils will be going to in year 7.
- A working group of primary and secondary colleagues have created some of the prompts in this ppt for year 6 teachers to help select appropriate work with their pupils and for secondary schools to encourage them how to use this work
- These pieces of best work will be put into folders for their feeder schools to see.

What does a good mathematician do?

atlp.org.uk

Turn and talk to a partner and be ready to share!



What does a good mathematician do?

atlp.org.uk

I try examples!

I spot patterns!

I make smart guesses!

I explain my ideas!

I try things out!

I say why it works!

I share and listen!

I link ideas together!

I make problems simpler!

I show my thinking!

I draw pictures!

Choose an example of your best work!

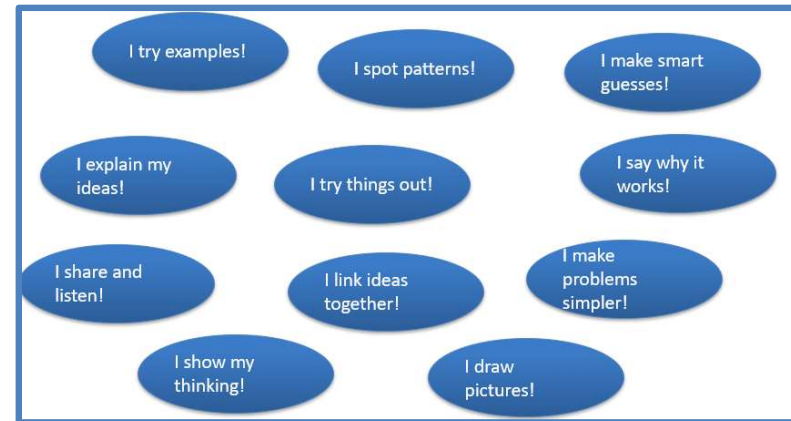
atlp.org.uk

Your Task:



Pick the piece of work that shows your best habits as a mathematician.

Be ready to explain why you are proud of it!



- Which work shows you trying examples?
- Where did you find a pattern?
- Which piece shows your best explaining?
- Where did you make a smart guess?
- Which work shows your thinking in different ways including drawings?
- Did you change a tricky problem into an easier one?

For the teacher

atlp.org.uk

Email to feeder schools

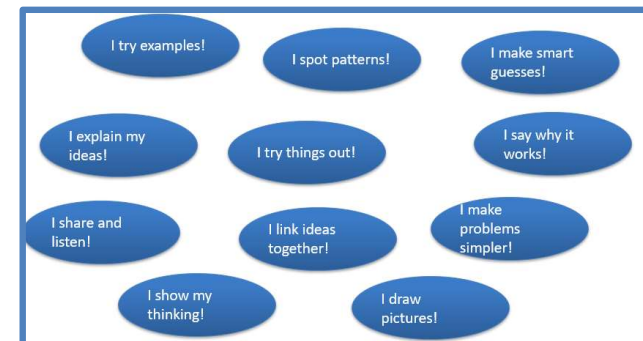
To whom it may concern,

As our pupils approach the end of their time with us at XXX, they have recently taken time to look back on their work with pride.

With that in mind, we asked them to select a piece of work that they were proud of and that they thought was their best work this year in maths. We asked them to consider ideas within the image below, including spotting patterns, showing their thinking and working and even drawing diagrams. We wanted you and your maths department to see it before they join you in September. We are encouraging our ATLP secondaries to read these files in departments to help develop a successful transition from primary to secondary (recommendation 8 of the EEF report of “Improving maths in Key stage 2 and 3”).

We hope your department will find it of interest and that our pupils will thrive when they start with you in September.

Have a great summer when it arrives
XXXX



ATLP project

- School #1 - the project was received well and they were pleased to see that the pedagogy for maths used at Two Gates was very similar to their school and would flow nicely. They also enjoyed seeing the pupils' work as a taster of what they would be working with in September.
- School #2: sent an email thanking us for the effort of sending this over for their few pupils from TG and that it would be useful going forward now they have an idea of what the pupils deemed their 'best work'. They also sent a well-done email to the pupils for their presentation.
- School #3- (Head of Year 7 and Transition lead) - *'Oh wow! Thank you so much for sending this across to us. I have forwarded this to our maths team who I know will be equally as impressed as I am. It is so lovely to see the hard work of what they have achieved in primary and how proud they are of this.'* This was followed by a very positive email to be shared with the pupils praising their efforts.

ATLP project

The secondaries maths depts were encouraged to look at the work received and analyse them with the following prompts:

- a. What does this tell us about the pupil's depth of understanding?
- b. What mathematical habits are evident?
- c. Would the work this pupil is proud of be mirrored in our Year 7 classroom?
- d. Does our current curriculum and pedagogy support this kind of thinking?



Education
Endowment
Foundation

IMPROVING MATHEMATICS IN KEY STAGES 2 AND 3

Summary of recommendations

1



Use assessment to build upon pupils' existing knowledge and understanding

- Assessment should be used not only to track pupils' learning but also to provide teachers with information about what pupils do and do not know.
- This should inform the planning of future lessons and the focus of targeted support.
- Effective feedback will be an important element of teachers' response to assessment.
- Feedback should be specific and clear, encourage and support further effort, and be given sparingly.
- Teachers not only have to address misconceptions but also understand why pupils may persist with errors.
- Knowledge of common misconceptions can be invaluable in planning lessons to address errors before they arise.

2



Use manipulatives and representations

- Manipulatives (physical objects used to teach maths) and representations (such as number lines and graphs) can help pupils engage with mathematical ideas.
- However, manipulatives and representations are just tools: how they are used is essential.
- They need to be used purposefully and appropriately to have an impact.
- There must be a clear rationale for using a particular manipulative or representation to teach a specific mathematical concept.
- Manipulatives should be temporary; they should act as a 'scaffold' that can be removed once independence is achieved.

8



Support pupils to make a successful transition between primary and secondary school



Support pupils to make a successful transition between primary and secondary school

There is a large dip in mathematical attainment and attitudes towards maths as children move from primary to secondary school. Primary and secondary schools should develop shared understandings of curriculum, teaching and learning. When pupils arrive in Year 7, quickly attain a good understanding of their strengths and weaknesses. Structured intervention support may be required for Year 7 pupils who are struggling to make progress. Carefully consider how pupils are allocated to maths classes. Setting is likely to lead to a widening of the attainment gap between disadvantaged pupils and their peers, because the former are more likely to be assigned to lower group.

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- Cotton Eyed Joe - where did they come from?
- It ain't what *you do*, it's the way that *they did* it!
- Don't do a test! Use "accurate measurements of whether children are at a similar attainment level".
- Use SATs info
- Try to retrieve data within lessons
- Ask the feeder school for pupils' best work!



<https://www.tes.com/magazine/teaching-learning/general/school-class-setting-does-ability-grouping-work>

- There is a large dip in mathematical attainment and attitudes towards maths as children move from primary to secondary school.
- Primary and secondary schools should develop shared understandings of curriculum, teaching and learning.
- When pupils arrive in Year 7, quickly attain a good understanding of their strengths and weaknesses.

- After 6 weeks of a summer break, pupils are in year.... Should the lesson experience be wildly different?
- How are lessons taught in years 1-6 in your feeder schools?
- How can you go about developing this shared understanding?

8



Support pupils to make a successful transition between primary and secondary school

So who has the expertise in your department to lead on KS1 and KS2 content / pedagogy?

8



Support pupils to make a successful transition between primary and secondary school

Summary

