Primary Mathematics Subject Leader Network Meeting (Spring 2023)

- Responding to local and national priorities
- Supporting the mathematics community in Gloucestershire

Aims

- Reflect further on the principles that support 'teaching for mastery' in mathematics.
- Prepare for 2023 national curriculum assessments.
- Consider how research supports subject leadership and provision.
- Discuss the importance of coherence, progression and consistency in the teaching of 'calculation'.

*** TO INFORM DISCUSSIONS ON THE DAY, PLEASE BRING THE MATHEMATICS EXERCISE BOOK FOR 3 PUPILS (REFLECTING AGE RANGE IN YOUR SCHOOL) THAT INCLUDES EVIDENCE OF CALCULATION WORK.**

NATIONAL UPDATES

- DfE and Ofsted updates.
- GLOW Maths Hub.

2023 STATUTORY ASSESSMENT

- Key changes for 2023.
- KS1 and KS2 teacher assessment.
- 2023 Y4 MTC and KS1/KS2 National Curriculum tests.

LEADERSHIP, CURRICULUM DEVELOPMENT AND CLASSROOM PEDAGOGY

- Calculation policy*: pupil voice and work scrutiny.
- NCETM: supporting calculation fluency.
- EEF: strategies that 'promote high quality mathematical talk'.

PROVIDING EQUITY TO LEARNERS WITHIN 'TEACHING FOR MASTERY' IN MATHEMATICS
NATHAN CROOK (EDUCATION CONSULTANT)

Workshop outline:

- Provide subject leaders with strategic thinking about how representations and structure, mathematical thinking, variation and fluency can be used in ways where pupils gain consistent access to age-appropriate concepts at a pitch where learning can be accessed.
- After working on a number of exercises, subject leaders will be empowered to share ideas with colleagues back at school.

THE USE OF 'BAR MODELLING' AS A REPRESENTATION TO SUPPORT TEACHING AND TO HELP PUPILS UNDERSTAND MATHEMATICAL STRUCTURE.
FLORA TURNER (MATHEMATICS SUBJECT LEADER, WINCHCOMBE ABBEY C of E PRIMARY ACADEMY)

Subject leaders will:

- understand the rationale underpinning an identified area for improvement;
- learn about the process of leading, monitoring and evaluating an aspect of curriculum development;
- gain an insight into practical approaches to effect change; and
  reflect on implications for their own setting.

PROVIDING EQUITY TO LEARNERS WITHIN 'TEACHING FOR MASTERY' IN MATHEMATICS

NATHAN CROOK (EDUCATION CONSULTANT)

Workshop outline:

- Provide subject leaders with strategic thinking about how representations and structure, mathematical thinking, variation and fluency can be used in ways where pupils gain consistent access to age-appropriate concepts at a pitch where learning can be accessed.
- After working on a number of exercises, subject leaders will be empowered to share ideas with colleagues back at school.

Nathan Crook (Education Consultant)

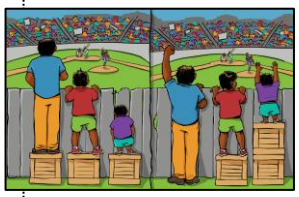
Prior to becoming a maths consultant, Nathan taught pupils in Y1-Y6 across three primary schools in Oxfordshire, (urban and rural settings). During this time, he qualified as a Maths Specialist Teacher (MaST); this led to him becoming part of the National College for Teaching and Leadership 'Small schools making an impact' programme. Driven by his passion for helping to ensure that all pupils access mathematics learning to the full, Nathan has more recently worked as an NCETM accredited independent maths consultant to support schools across the country in delivering high quality teaching and learning – most notably across early years and primary phases. As well as providing training, he continues to work alongside classes and groups of children to explore how they learn best.

Matters Arising: Autumn 2022

Steve Lomax (Education Consultant)

How do we make mathematics teaching equitable for all pupils?

- Explore curricular, pedagogical and environmental approaches that enable all pupils, in particular pupil premium and SEND, to keep up and reach equal outcomes with their peers.
- Discuss how traditional intervention approaches can result in wide attainment gaps and a tail of under-achievement for some pupils



Department for Education

Early Career Framework

January 2019

2022 EYFS, KS1 and KS2 Performance Data

- Statistics: EYFS profile
- Statistics: KS1
- Statistics: KS2

Collection

National curriculum assessments: key stage 1 tests

Collection

National curriculum assessments: key stage 2 tests

Key stage 1 assessment and reporting arrangements

October 2022

Key stage 2 assessment and reporting arrangements

October 2022

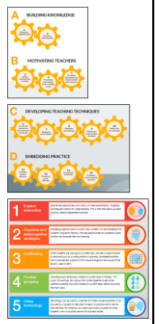
School inspection handbook

- Updated EIF handbooks (from September 2022).
- Section 5: now **graded** inspections.
- Section 8 ('Outstanding' / 'Good'): now **ungraded** inspections
- Inspections with no formal designation and unannounced behaviour visits: now **urgent** inspections.
- [School inspection handbook] 'Good' descriptors (*Quality of Education*): removed transitional arrangements and added new descriptor to recognise some aspects (of the curriculum) may be more developed than others.
- Summary table of Ofsted state-funded school inspections: sets out new types of inspection, school eligibility, possible outcomes and likely timing of inspection.

Additional prompts to support self-evaluation

Mathematics subject leader self-evaluation prompts:

- subject aims, lesson design/intent and timetable commitment;
- knowledge, understanding and skills' progression (YR-Y6);
- changes made to curriculum plans in light of COVID-19;
- the contribution that CPD makes to teaching expertise (ref Effective Professional Development, Education Endowment Foundation, October 2021);
- curriculum adaptations for pupils with additional needs, reconciling this with the School inspection handbook (para 250) and EEF guidance;
- evidence that pupils know more, remember more and are able to do more over time (including use of formative and summative assessments);
- the contribution made to school values and pupils' wider development, including SMSC;
- extra-curricular opportunities; and
- collaboration with other settings (primary/secondary) plus extended stakeholder community.



Pupil premium: overview

Updated 27 October 2022

Using pupil premium: guidance for school leaders

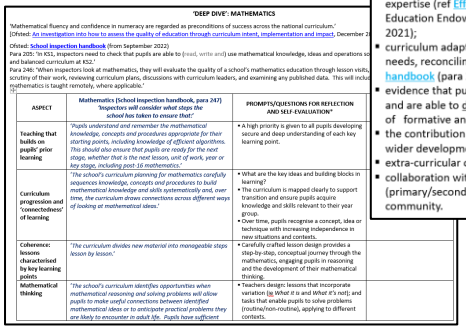
March 2022

Use of the pupil premium section has been updated to reference the 'menu of approaches' as set out in Using pupil premium: guidance for school leaders.

Amberley Parochial Primary

(Paul Beech)

How our 'vision for mathematics' drives leadership, provision and pupil outcomes.



'DEEP DIVE': MATHEMATICS

'Mathematical fluency and confidence in numeracy are regarded as preconditions of success across the national curriculum.'

Ofsted: An investigation into how to assess the quality of education through curriculum intent, implementation and impact, December 2

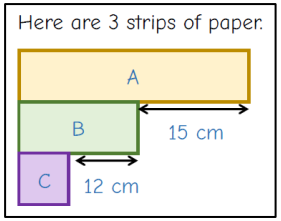
Ofsted: School inspection handbook (from September 2022)

Para 205: 'In KS1, inspectors need to check that pupils are able to (read, write and) use mathematical knowledge, ideas and operations so and balanced curriculum at KS2.'

Para 246: 'When inspectors look at mathematics, they will evaluate the quality of a school's mathematics education through lesson visits, scrutiny of their work, reviewing curriculum plans, discussions with curriculum leaders, and examining any published data. This will inclu mathematics is taught remotely, where applicable.'

ASPECT	Mathematics (School inspection handbook, para 247) 'Inspectors will consider what steps the school has taken to ensure that:'	PROMPTS/QUESTIONS FOR REFLECTION AND SELF-EVALUATION"	
Teaching that builds on pupils' prior learning	'Pupils understand and remember the mathematical knowledge, concepts and procedures appropriate for their starting points, including knowledge of efficient algorithms. This should also ensure that pupils are ready for the next steps, whether that is the next lesson, unit of work, year or key stage, including post-16 mathematics.'	• A high priority is given to all pupils developing secure and deep understanding of each key learning point.	
Curriculum progression and 'connectedness' of learning	'The school's curriculum planning for mathematics carefully sequences knowledge, concepts and procedures to build mathematical knowledge and skills systematically and, over time, the curriculum draws connections across different ways of looking at mathematical ideas.'	• What are the key ideas and building blocks in learning? • The curriculum is mapped clearly to support transition and ensure pupils acquire knowledge and skills relevant to their year group. • Over time, pupils recognise a concept, idea or technique with increasing independence in new situations and contexts.	
Coherence: lessons characterised by key learning points	'The curriculum divides new material into manageable steps lesson by lesson.'	• Carefully crafted lesson design provides a step-by-step, conceptual journey through the mathematics, engaging pupils in reasoning and the development of their mathematical thinking.	
Mathematical thinking	'The school's curriculum identifies opportunities when mathematical reasoning and solving problems will allow pupils to make useful connections between identified mathematical ideas or to anticipate practical problems they are likely to encounter in adult life. Pupils have sufficient	• Teachers design lessons that incorporate variation (ie What it is and What it's not); and tasks that enable pupils to solve problems (routine/non-routine), applying to different contexts.	

Barvember

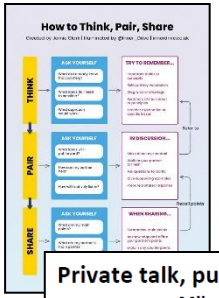


Here are 3 strips of paper.

A

B — 15 cm

C — 12 cm



How to Think, Pair, Share

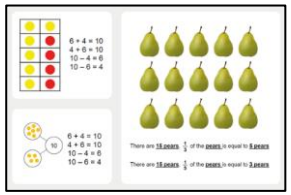
THINK — PAIR — SHARE

Private talk, public conversation

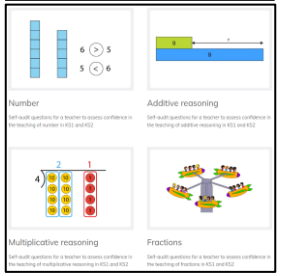
Mike Askew

King's College London

PRIMARY CALCULATION GUIDANCE



PRIMARY SUBJECT KNOWLEDGE AUDIT



Number

Additive reasoning

Multiplicative reasoning

Fractions

GLOW Maths Hub

(Anthony Mitchell, Ed Neale)

- 'Teaching for mastery' pathway.
- GLOW live!
- Workshop offer (2022/23).

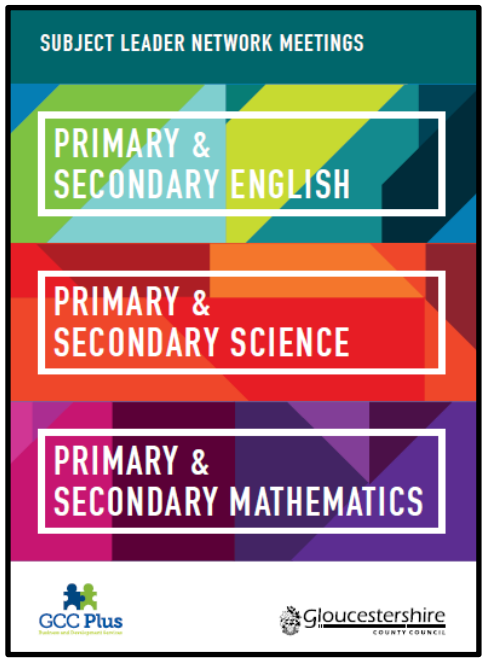
White Rose Maths

Living our values every day

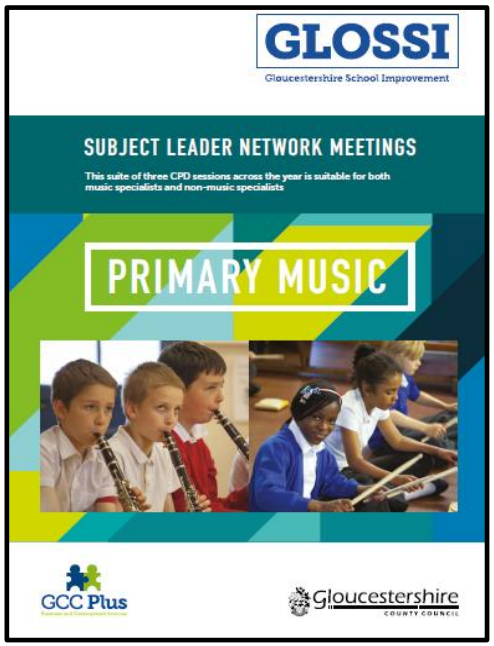
Accountable · Integrity · Empower · Respect · Excellence

GCC

You may also be interested in:



English SLNM
Science SLNM
Mathematics SLNM



Computing SLNM
Geography SLNM
Music SLNM

LOOK OUT FOR!

New in 2023/24
History SLNM
PSHE SLNM

New in 2023/24
Teaching and learning in:
Y1 Y2 Y3 Y4 & Y5

One-day CPD
Ideas and suggestions to support planning, teaching and assessment.

For Y1, Y2, Y3, Y4 and Y5 teachers

Covers: English, mathematics and science

To book a place: https://www.businesssupportservices.org/

NATIONAL UPDATES

- DfE and Ofsted updates.
- GLOW Maths Hub.

The distinction between curriculum, pedagogy and assessment

Ofsted

Curriculum

Pedagogy

Assessment

'*When thinking about how all pupils can develop expertise in mathematics, it's really useful to draw a distinction between the* ***curriculum***, ***pedagogy*** *and* ***assessment***.'

- Curriculum **['WHAT']**: what pupils will learn.
- Pedagogy **['HOW']**: the nature of the teaching and the rehearsal.
- Assessment **['CHECK']**: what is known, understood and remembered.

Curriculum thinking should happen first, followed by the pedagogies. This helps to avoid situations where pedagogies are considered first, rather than pupils' intended learning.

'DEEP DIVE': MATHEMATICS

'Mathematical fluency and confidence in numeracy are regarded as preconditions of success across the national curriculum.'
[Ofsted: An investigation into how to assess the quality of education through curriculum intent, implementation and impact, December 2018]

Ofsted: **School inspection handbook** (from September 2022)
Para 205: 'In KS1, inspectors need to check that pupils are able to (read, write and) use mathematical knowledge, ideas and operations so they are able to access a broad and balanced curriculum at KS2.'
Para 246: 'When inspectors look at mathematics, they will evaluate the quality of a school's mathematics education through lesson visits, discussions with pupils and scrutiny of their work, reviewing curriculum plans, discussions with curriculum leaders, and examining any published data. This will include understanding how mathematics is taught remotely, where applicable.'

ASPECT	Mathematics (School inspection handbook, para 247) *'Inspectors will consider what steps the school has taken to ensure that:'*	PROMPTS/QUESTIONS FOR REFLECTION AND SELF-EVALUATION*	NEXT STEPS
Teaching that builds on pupils' prior learning	*'Pupils understand and remember the mathematical knowledge, concepts and procedures appropriate for their starting points, including knowledge of efficient algorithms. This should also ensure that pupils are ready for the next stage, whether that is the next lesson, unit of work, year or key stage, including post-16 mathematics.'*	▪ A high priority is given to all pupils developing secure and deep understanding of each key learning point.	
Curriculum progression and 'connectedness' of learning	*'The school's curriculum planning for mathematics carefully sequences knowledge, concepts and procedures to build mathematical knowledge and skills systematically and, over time, the curriculum draws connections across different ways of looking at mathematical ideas.'*	▪ What are the key ideas and building blocks in learning? ▪ The curriculum is mapped clearly to support transition and ensure pupils acquire knowledge and skills relevant to their year group. ▪ Over time, pupils recognise a concept, idea or technique with increasing independence in new situations and contexts.	
Coherence: lessons characterised by key learning points	*'The curriculum divides new material into manageable steps lesson by lesson.'*	▪ Carefully crafted lesson design provides a step-by-step, conceptual journey through the mathematics, engaging pupils in reasoning and the development of their mathematical thinking.	
Mathematical thinking	*'The school's curriculum identifies opportunities when mathematical reasoning and solving problems will allow pupils to make useful connections between identified mathematical ideas or to anticipate practical problems they are likely to encounter in adult life. Pupils have sufficient*	▪ Teachers design: lessons that incorporate variation (ie *What it is* and *What it's not*); and tasks that enable pupils to solve problems (routine/non-routine), applying to different contexts.	

Representation and structure of mathematics	*approaches that enable pupils to understand the mathematics they are learning.'*	high quality resources to support lesson planning? ▪ Concrete/pictorial representations are chosen carefully to help build pupils' procedural and conceptual knowledge together.	
Teachers' subject expertise	*'All teachers of mathematics, including non-specialist teachers of mathematics, have sufficient mathematical and teaching content knowledge to deliver topics effectively.'*	▪ The curriculum leader facilitates a planned, bespoke programme of CPD for all practitioners.	
Numeracy in other curriculum subjects	*'Pupils' mathematical knowledge is developed and used, where appropriate, across the curriculum.'*	▪ Curriculum design provides opportunities for pupils to apply mathematical knowledge, understanding and skills in other subjects. ▪ Pupils make use of a concept, idea or technique in new situations.	

Pupils with SEND in both mainstream and specialist settings

School inspection handbook

Ofsted's approach to evaluating the curriculum

214. 'Inspectors will focus on what our inspection experience and research show are the most important factors to consider. These are the extent to which:

- the school's curriculum:
  - is ambitious and designed to give pupils, particularly disadvantaged pupils and pupils with **SEND**, the knowledge they need to take advantage of opportunities, responsibilities and

luding when delivered remotely

:ND:
ucceed in life;
and are able to do more. They

levant;
ing or employment at each stage
e ready for the next stage and
l are able to read to an age-
e of accessing the rest of the

les

s in order to improve their
and conduct that reflects the
ion are likely to include
hese pupils, taking account of

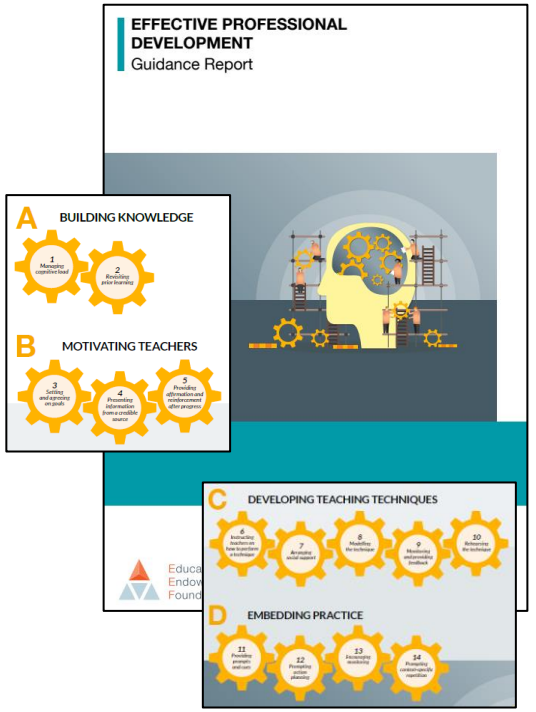
uals and groups, such as pupils
small sample of these pupils, how
upils with **SEND**, children looked
eds. In order to do this,
pupils and consider the way the
child receives the support they
opriate reasonable adjustments
D code of practice.'

250. 'Inspectors will gather and evaluate evidence about …
… whether leaders are suitably ambitious for all pupils with SEND;
… how well leaders identify, assess and meet the needs of pupils with SEND, including when pupils with SEND are self-isolating and/or receiving remote education;
… how well leaders ensure that the curriculum is coherently sequenced to meet all pupils' needs, starting points and aspirations for the future;
… how successfully leaders involve parents, carers and, as necessary, other professionals/specialist services in deciding how best to support pupils with SEND, including agreeing the approach to remote education;
… how well leaders include pupils with SEND in all aspects of school life;
… how well leaders ensure that pupils' outcomes are improving as a result of any different or additional provision being made for them, including any reasonable adjustments in remote education provision. This covers outcomes in: ○ *communication and interaction;* ○ *cognition and learning;* ○ *physical health and development;* and ○ *social, emotional and mental health;*
… how well pupils with SEND are prepared for their next steps in education, employment and training and their adult lives, including: further/higher education and employment, independent living, participating in society and being as healthy as possible in adult life.' [See SEND code of practice: 0 to 25 years.]

Prompts to support self-evaluation

Mathematics subject leader self-evaluation prompts:

- subject aims, lesson design/intent and timetable commitment;
- knowledge, understanding and skills' progression (YR-Y6);
- changes made to curriculum plans in light of COVID-19;
- the contribution that CPD makes to teaching expertise (ref Effective Professional Development, Education Endowment Foundation, October 2021);
- curriculum adaptations for pupils with additional needs, reconciling this with the School inspection handbook (para 250) and EEF guidance;
- evidence that pupils know more, remember more and are able to do more over time (including use of formative and summative assessments);
- the contribution made to: school vision and values; cultural capital; pupils' wider development; SMSC; and British values;
- extra-curricular opportunities; and
- collaboration with other settings (primary/secondary) plus extended stakeholder community.



‘What Maths Hubs did for schools, colleges and pupils in 2021/22. A new comprehensive, full-colour report, with case studies, quotes and statistics.’

Maths Hubs Programme Annual Report

2021/22

Contents

MATHSHUBS

A year of progress and innovation

We are both delighted to be able to introduce the first of our new Maths Hubs Programme Annual Reports, focusing on the work in 2021/22.

Maths Hubs provide significant support to schools in England, and we hope the report conveys the wide scope and reach of the work.

The year was again very challenging for schools as they addressed the continuing impact of the Covid-19 pandemic, not least on mathematics. So we were particularly delighted to reach a new milestone for the programme – working with over 50% of the schools in England within one academic year. This was partly due to the way we started to adapt our work with schools, for example often providing a blended approach of face-to-face and online work.

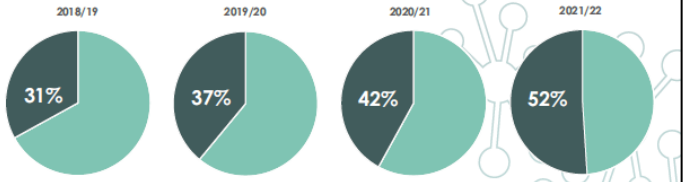
In 2021/22, the programme has continued to develop and innovate including: the important new Mastering Number Programme in primary schools (see page 2); new support work for subject leadership in the secondary phase, at both school and trust level (see page 4); and new development programmes for Early Career Teachers (see page 8). This is all backed up by our ongoing research and innovation activity (see page 11).

All Maths Hubs’ work depends on partnership. Maths Hubs continued to work in very close partnership with the NCETM in 2021/22, and began fruitful collaboration with other new system leader partners such as Teaching School Hubs. We are also very grateful for the continued sponsorship and investment by the Department for Education, without which none of the work would have been possible. However, perhaps most of all, we value the partnership with the thousands of schools, their leaders and teachers, who collectively make up, and lead, the Maths Hubs Network.

Thank you to all our partners.

Kathryn Greenhalgh
Maths Hub Lead and Chair of the Maths Hubs Council

Charlie Stripp
National Director, NCETM



Growth of schools’ involvement in the Maths Hubs Programme

In 2021/22, the number of primary schools working with their Maths Hub reached a new record, with over 9,000 schools engaged in one or other Maths Hub project.

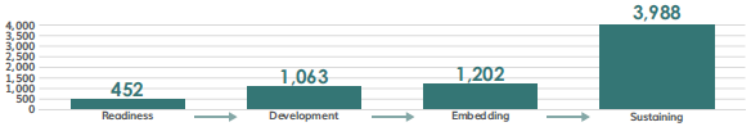
9,339
primary schools
working with their Maths Hub

More than 6,500 of these schools (see bar chart below) participated in Teaching for Mastery Work Groups, led by a Mastery Specialist working for their local Maths Hub. Schools were at various stages of development, from the initial ‘Mastery Readiness’ stage through to ‘Sustaining’ further down the line (see bar chart below).

A growing trend this year has been the participation of schools from Multi-Academy Trusts (MATs) as the relationship between their maths leads and the local Maths Hub has strengthened.

For each school – typically – two lead participants work with colleagues from other schools in the Work Group throughout the year, and then work with leadership back in the school to improve the teaching of mathematics. In some groups, schools receive further support through visits from the Mastery Specialist. The expectation is that schools will continue to work with their Maths Hub in order to sustain the continuous improvement.

The foundations that pupils build in Reception and Key Stage 1 are crucial to their long-term mathematical development, so 2021/22 saw the introduction of a major new initiative (see below) to support leaders and teachers in strengthening fluency with number.



Number of schools at the four stages of Teaching for Mastery Work Groups in 2021/22

// We introduced Mastery Number in our school and the children are already reaping the rewards. The sessions are providing them with the tools to not only visualise, but articulate good number sense. In turn, this is having a positive impact in the rest of maths lessons as the children are becoming confident mathematicians. //

Cath Hudson
Maths Lead, South Petherton C of E Infants & Pre-School

New in 2021/22: Mastering Number

A new feature for 2021/22 was the Mastering Number Programme, which began in 5,000 schools. Under the programme, teachers in Reception, Year 1 and Year 2 run short, daily sessions on number for ten weeks every term. The aim – assuming schools repeat the sessions in successive academic years – is that children leave Key Stage 1 with fluency in calculation and confidence and flexibility with numbers. Teaching resources, session plans and guidance are provided centrally by the NCETM.

The abacus-style rekenrek is used in many of these sessions.

As well as equipping pupils with the number fluency they’ll need to handle maths in Key Stage Two, the programme is a powerful source of professional development for the teachers, since it deepens their knowledge of how children build understanding in the early years of primary school. Feedback from teachers, in emails and forum posts, on the impact on pupils was overwhelmingly positive.

NRICH Events Donate

Welcome to the Primary Teacher homepage

Primary Curriculum

Curriculum support for Primary teachers

Primary curriculum mapping
Meeting the aims of the NC
Other resources

Working Mathematically

Developing pupils' mathematical thinking

Mathematical Habits of Mind
Be a Mathematician!
Developing Problem Solving
Maths Club activities

Features

The tasks in this collection may require your learners to demonstrate their resilience...

See all primary Live problems
See all primary Previous features

Professional Development

Book Bespoke PD
Book Forthcoming Events
Professional Development Articles

News and Recent Solutions

See solutions to recent primary problems
Sign up for our Newsletter

Tweets from @nrichmat

NRICH maths Retweeted

Birchwood C of E
@Birchwood... · 21h

Year 5 loved their morning maths activity @nrichmaths COUNTDOWN Such a fun wa to develop fluency skills using all the operations! #bcepsyear5 #bcepsmaths

Being Resilient - Primary

Being Resilient - Primary is part of our Developing Mathematical Habits of Mind Primary collection. You can see the full collection by scrolling down to the bottom of the Primary Curriculum page.

Good thinkers are resilient. They don't give up easily, and are motivated to work hard and keep going when faced with challenges. They recognise that we all fail sometimes, and when this happens, they bounce back and try alternative approaches. Find out more in What Does it Feel Like to Do Maths, which includes a film of the mathematician Andrew Wiles talking about his personal experience of seeking a proof of Fermat's Last Theorem.

NRICH Events Donate

Welcome to the Early Years Foundation Stage homepage

Early Years Curriculum

Welcome to our set of Early Years Foundation Stage (EYFS) resources

Early Years activities
Early Years articles
Early Years useful documents

Features

Our latest activity encourages children to experience and talk about position and direction
You may also like...

Professional Development

Book Bespoke PD
Book Forthcoming Events
Book our Hands-on-Roadshow
Professional Development Articles

Children's Thinking

Article: Children's Thinking
Some examples of children's thinking

Tweets from @nrichmaths

NRICH maths Retweeted

Birchwood C of E
@Birchwood... · 21h

Year 5 loved their morning maths activity @nrichmaths COUNTDOWN Such a fun way to develop fluency skills using all the operations! #bcepsyear5 #bcepsmaths

Primary Curriculum

‘On this page, you will find four groups of resources which will help you embed problem solving into your curriculum:

- Curriculum Mapping Documents;
- Features;
- Collections; and
- Resources to develop *Mathematical Habits of Mind*.’

‘If you are an EY practitioner, you may find our Early Years homepage more appropriate than this one. To find out about the thinking that informs the development of these tasks, read What We Think and Why We Think it - Primary.’

Primary Curriculum Mapping Documents

The documents on this page contain everything you need to include problem-solving activities in your planning, as they link up the National Curriculum statements with some of our favourite activities.

Features

Our features gather together tasks and articles around a theme. They are very usefully explored during a staff meeting, for example. Our features generally fall into one of the following four categories:

Aims of the National Curriculum

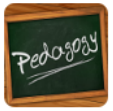
The features on this page are linked to the three aims of the National Curriculum - number fluency, reasoning and problem solving.

Key National Curriculum Content

On this page, you will find features linked to different aspects of the 2014 National Curriculum, including new curriculum content.

Manipulatives

These features focus on how concrete objects can be used as manipulatives in the classroom, and how this can form the basis for problem-solving activities.



Pedagogy

The features listed here come with ideas for embedding the activities into your classroom practice.

Collections

The **collections** below include our favourite rich tasks, some of which may not appear on the mapping documents, so we suggest you look here too!

Problem-solving Skills

These activities are all based around developing problem-solving skills at KS1 and KS2.

Number

This collection of resources will support understanding of number.

Geometry

This collection of tasks focus on the concepts of shape, position and movement.

Measurement

These resources are based around measuring in a variety of different ways.

Statistics

This collection of activities covers the areas of probability and collecting and analysing data.

Mathematical Habits of Mind

In their paper, Habits of Mind: An Organizing Principle for Mathematics Curricula, researchers Cuoco, Goldenberg and Mark call for mathematics curricula to have ways of thinking about mathematics at their core, rather than specific mathematical results. With this in mind, we believe that children learn better when they are curious, resourceful, resilient and collaborative.

Here are some collections of mathematical activities designed to give Stage 1 and 2 learners opportunities to develop these desirable characteristics.

Being Curious - Primary

These problems will exploit primary learners' natural curiosity and provoke them to ask good mathematical questions.

Being Resourceful - Primary

These problems require careful consideration. Allow your learners time to become absorbed in them.

Being Collaborative - Primary

These problems are ideal for primary school children to work on with others. Encourage your learners to share ideas, and recognise that two heads can be better than one.

Being Resilient - Primary

These problems require resilience for primary school children. Encourage your learners to persevere - there's often a great sense of achievement when we've had to struggle.

2023 STATUTORY ASSESSMENT

- Key changes for 2023.
- KS1 and KS2 teacher assessment.
- 2023 Y4 MTC and KS1/KS2 national curriculum tests.

Pre-key stage / Engagement Model Moderation Clinics

Primary assessments: future dates

Future dates for the key stage 1 and key stage 2 tests (commonly referred to as SATs), phonics screening check, multiplication tables check and reception baseline assessment.

STA, updated March 2023
'*Added downloadable calendars with important 2023 assessment dates for KS1 and KS2.*'

Key stage 1

The key stage 1 tests should be administered during May 2023.

Date	Activity
May 2023	Key stage 1 test period
Week commencing Monday 12 June 2023	Phonics screening check week

Key stage 2

The key stage 2 tests are timetabled from Tuesday 9 May to Friday 12 May 2023.

Date	Activity
Tuesday 9 May 2023	English grammar, punctuation and spelling papers 1 and 2
Wednesday 10 May 2023	English reading
Thursday 11 May 2023	Mathematics papers 1 and 2
Friday 12 May 2023	Mathematics paper 3

Guidance

Key stage 2: guide to registering pupils for the tests

Information for primary schools on how to submit details of pupils who are eligible for key stage 2 (KS2) national curriculum tests (commonly called SATs) in 2023.

Code	Description
Registered	Pupil is expected to sit the test or will later be recorded as 'just arrived' or 'unable to access' on the attendance register
Below	Pupil is working below the overall standard of the test subject
Future	Pupil is taking one or more, but not all, assessments in a future year
Left	Pupil has left the school
Previous	Pupil took one or more, but not all, assessments in a previous year
Unregistered	Pupil appears incorrectly in 'existing pupils' list

'By 11:59 pm on Friday 10 March 2023, you must:

- check your pupil list;
- add pupils who are not on you school's 'existing pupils' list; and
- if required, correct pupils' details such as their name or date of birth.

All pupils will show as 'registered' for each test subject. You can change a pupil's status by selecting 'edit' and selecting one of the following codes from the drop-down list:'

Statutory participation in trialling of national curriculum assessments

Subject	Key stage	Trial period
English reading	KS1 and KS2	April-June
English GPS	KS1 and KS2	April-June
Mathematics	KS1 and KS2	April-June
PSC	KS1	April-June
RBA	EYFS	September-October

'There are four appointed agencies that run trials:

- Alpha Plus;
- Australian Council for Educational Research (ACER);
- National Foundation for Educational Research (NFER); and
- Scottish Qualifications Authority (SQA).'

'Trials are a vital part of the national curriculum test development process. They help to ensure that the questions are appropriate and fair, that tests are valid and reliable, and that they help to set and maintain standards. They do not test the pupils' abilities and are not a test of the school; they test only the materials in development. Selected schools are required to participate in the trials for statutory national curriculum assessments. If selected, a school will trial one subject only in any one year.' [STA, 23.01.23]

Collection

Multiplication tables check

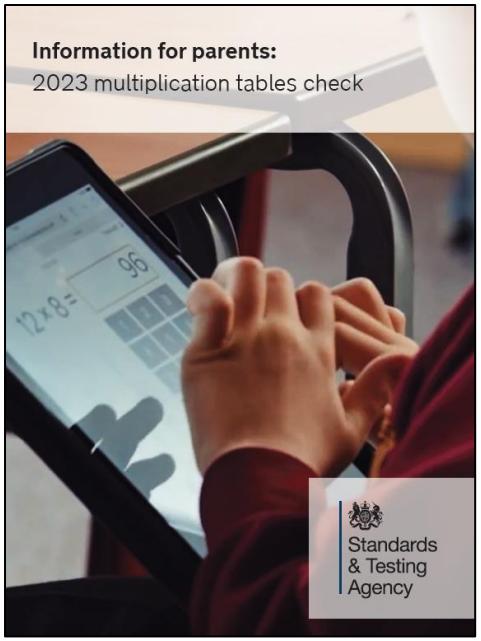
‘Information and guidance about the MTC.’ [November 2022]

Contents

‘The MTC is statutory for all Y4 pupils … the purpose is to determine whether pupils can recall their times tables fluently … It will help schools to identify pupils who have not yet mastered their times tables, so that additional support can be provided.’

‘Schools must administer the MTC to all eligible Y4 pupils between **Monday 5 June** and **Friday 16 June 2023**.
Schools can use the following week, Monday 19 June to Friday 23 June, to administer the check to any pupils who were absent during the first two weeks or in case of any delays to the administration of the check due to technical difficulties.
Schools can access the MTC service to prepare for the check via DfE Sign-in from Monday 17 April 2023.’

National curriculum assessments helpline: 0300 303 3013 or email assessments@education.gov.uk.



Official Statistics

Multiplication tables check attainment: 2022

DfE, November 2022

2022 Y4 MTC (mean average score)	Total	Boys	Girls
England	19.8	20.0	19.6
Gloucestershire	19.1	19.4	18.8
South West	19.1	19.4	18.9

Headlines

- All pupils: **mean average score was 19.8** out of 25.
- **Modal score was 25** (full marks), with **27%** of pupils achieving this score.
- Disadvantaged pupils performed less well in the check than other pupils. Of pupils who took the check, the **average score for disadvantaged pupils was 17.9**, while the **average score for pupils not known to be disadvantaged was 20.5**.
- Pupils with a first language of English performed less well in the check than pupils with EAL. Of pupils who took the check, the **average score for pupils with a first language of English was 19.4** while the **average score for pupils with EAL was 21.2**.
- London was the highest performing region, with an average score of 20.9. In other regions, the average score ranged from 19.1 in the South West to 19.9 in the North West and the West Midlands.

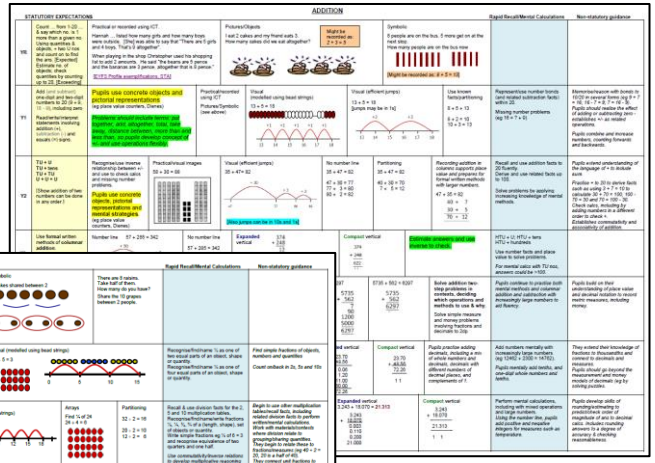
LEADERSHIP, CURRICULUM DEVELOPMENT AND CLASSROOM PEDAGOGY

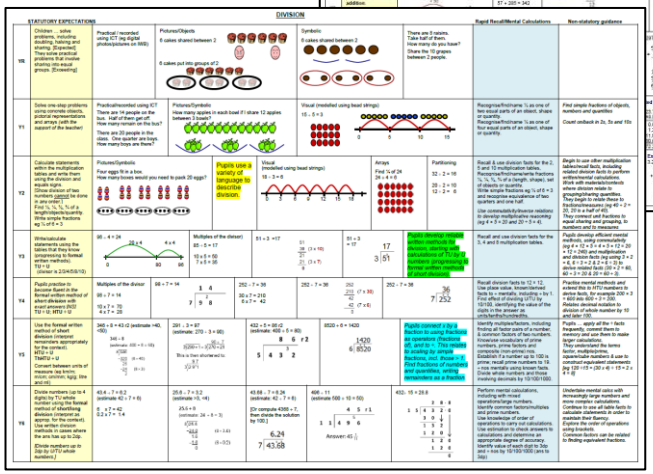
- Calculation policy: pupil voice and work scrutiny.
- NCETM: supporting calculation fluency.
- EEF: strategies that 'promote high quality mathematical talk'.

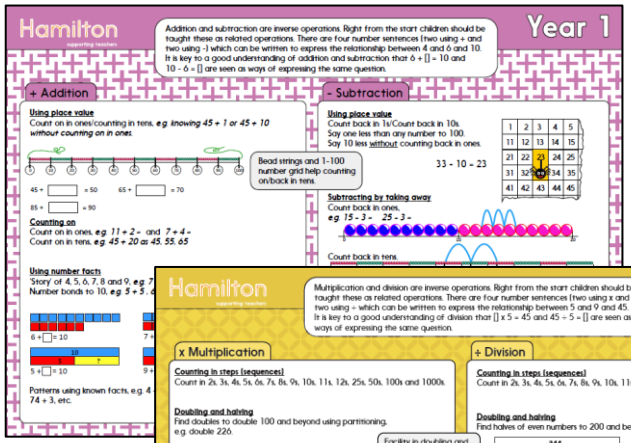
PROGRESSION MAPS FOR KEY STAGES 1 AND 2

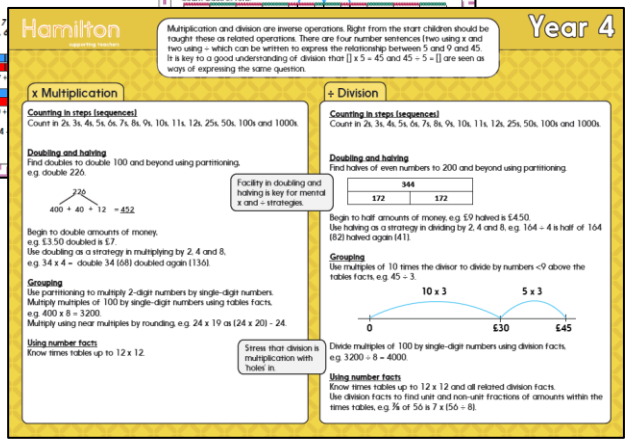
The progression maps are structured using the topic headings as they appear in the National Curriculum

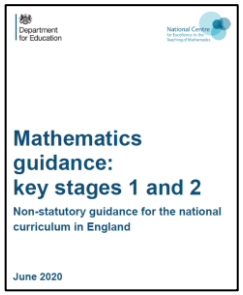
NCETM
NATIONAL CENTRE FOR EXCELLENCE IN THE TEACHING OF MATHEMATICS

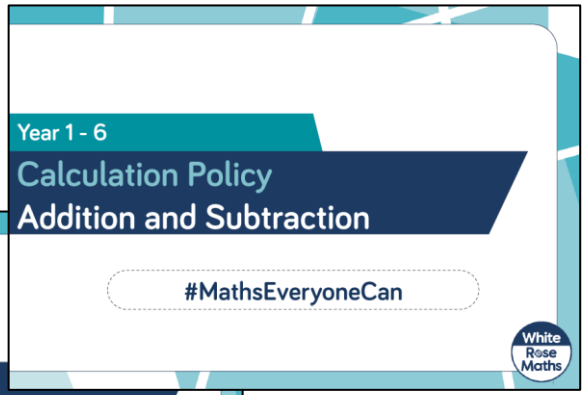


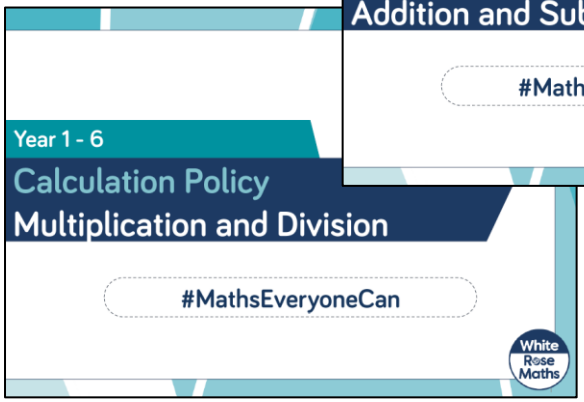












Name the year!

11,576 + 8,058 = 19,634
Convince me that this is the correct answer.

72.5 + 45.73 =

47 + 9 = 56
Convince me that this is the correct answer.

15 + 28 =

3.243 km + 18.07 km = 21.313 km
Convince me that this is the correct answer.

2,607 + 879 =

2,374 – 449 = 1,925
Convince me that this is the correct answer.

3,347 – 1,889 =

11 – 4 = 7
Convince me that this is the correct answer.

13 – 5 =

121 – 34 = 87
Convince me that this is the correct answer.

356 – 82 =

6 pairs of socks means I have 12 socks altogether.
Convince me that this is the correct answer.

How many toes altogether on 4 feet?

136 x 52 = 7,072
Convince me that this is the correct answer.

9,025 x 9 =

34 x 7 = 238
Convince me that this is the correct answer.

147 x 6 =

15 ÷ 5 = 3
Convince me that this is the correct answer.

Four eggs fit in a box.
How many boxes do you need to pack 20 eggs?

1,118 ÷ 43 = 26
Convince me that this is the correct answer.

29.75 ÷ 7 =

51 ÷ 3 = 17
Convince me that this is the correct answer.

68 ÷ 4 =

Pupil conference: *Calculation strategies*

EYFS statutory framework (September 2021)

Mathematics Educational Programme

'Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers.
By providing frequent and varied opportunities to build and apply this understanding – such as using manipulatives, including small pebbles and tens frames for organising counting – children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built.'

Early learning goals (ELGs)

Number

- Have a deep understanding of number 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.

Numerical patterns

- Verbally count beyond 20, recognising the pattern
- Compare quantities up to 10 in different contexts, r
  greater than, less than or the same as the other qu
- Explore and represent patterns within numbers up
  double facts and ho

Y1

9 + 7 = 16
Convince me th

11 + 5 =

Y2

47 + 9 = 56
Convince me that this is the correct answer.

15 + 28 =

Y3

121 – 34 = 87
Convince me that th

356 – 82 =

Y4

2,374 – 449 = 1,925
Convince me that this is the correct answer.

3,347 – 1889 =

Y5

136 x 52 = 7,072
Convince me that this is the correct ans

9,025 x 9 =

Y6

6,574 x 31 = 203,794
Convince me that this is the correct ans

23 x 6.1 =

Y1

When I put the 10 bears into pairs/groups of two, there are five groups altogether.
Convince me that this is the correct answer.

Arrange the 12 people into equal rows.
Show a different way to arrange them in equal rows.

Y2

15 ÷ 5 = 3
Convince me that this is the correct answer.

Four eggs fit in a box.
How many boxes do you need to pack 20 eggs?

Y3

51 ÷ 3 = 17
Convince me that this is the correct answer.

68 ÷ 4 =

Y4

98 ÷ 7 = 14
Convince me that this is the correct answer.

174 ÷ 6 =

Y5

392 ÷ 9 = 43 r5
Convince me that this is the correct answer.

2,264 ÷ 8 =

Y6

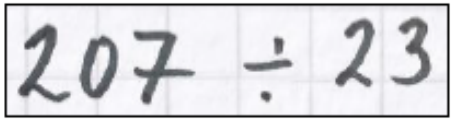
1,118 ÷ 43 = 26
Convince me that this is the correct answer.

29.75 ÷ 7 =

THREE CALCULATIONS TO ENCOURAGE AND SUPPORT FLUENCY

Prompts for teachers to draw out mathematical thinking in KS2 or KS3 pupils

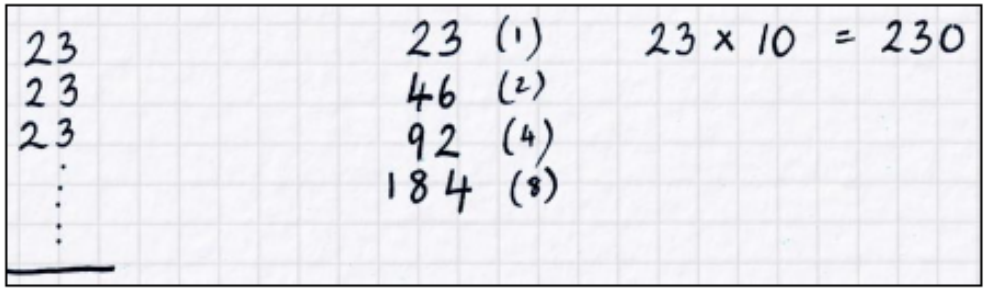
Question 2



This is an example of where the formal written method of division (the 'bus stop' approach, perfectly efficient for many calculations) isn't any help, because 23 doesn't 'go into' 2 or 20. So, we're back at square one.

After that realisation, a very helpful first step – using a quotitive or grouping model for division – is to see this as asking us 'how many 23s are there in 207?'

Pupils will then approach the task in different ways, probably with jottings, possibly including these approaches. The word 'chunking' might even be heard somewhere.



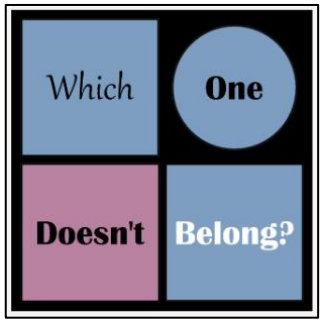
As ever, arithmetic slips will be the main enemy here. The neatest, and speediest, method will probably start with seeing that ten times 23 (230) is close to the 'target' number of 207. But, what happens in the brain during the step that ends with seeing that 9 times 23 is 207 must vary wildly from pupil to pupil, as it does from teacher to teacher. So, getting a few pupils to try to articulate their thoughts would be a very interesting and fruitful exercise for everyone in the room.

FOUR WAYS TO CREATE BETTER MATHEMATICAL TALK IN YOUR CLASSROOM

And resources you might like to explore

'The full effects of lockdowns and reduced social contact during the pandemic have yet to be fully understood. But already some teachers are reporting that the children they teach are less verbal and less articulate than in previous classes they have taught, particularly in KS1. In this article, we look at practical ideas for improving mathematical talk in the classroom and suggest some resources.'

1. **Create an expectation of mathematical talk.**
2. **Introduce vocabulary.**
3. **Support children in beginning mathematical talk.**
4. **Encourage more reluctant talkers.**



Resources

The resources below were recommended for supporting mathematical oracy by teachers in the Twitter chats.

Recommended for further exploration of mathematical talk

- Making Number Talks Matter is a YouTube discussion between two teachers from California, in which they offer advice, and suggest strategies and tasks, to help pupils become confident communicators in mathematics.
- Private talk, public conversation (Mike Askew, King's College, London) explores how to make mathematical discussion more meaningful, particularly through pair work followed by class discussion.

Recommended for introducing mathematical language

- NCETM Mathematics glossary for teachers in Key Stages 1 to 3 from 2014.
- Illustrated Mathematics Dictionary (www.mathsisfun.com).
- Frayer Model, part of a teacher-training website developed in Texas, containing examples of Frayer Models (graphic organisers) and guidance about ways of using them effectively.

Recommended for finding stem sentences to support learning and oracy

- Mathematics guidance: key stages 1 and 2 (DfE 2020): the pale blue 'Language focus' boxes provide ideas for stem sentences and vocabulary to be used in each topic area.
- Stem Sentences is a part of the Enigma Maths Hub website, providing examples of stem sentences and ways in which they may be used.

Recommended for promoting discussions wider than 'the answer'

- Which One Doesn't Belong? (WODB) is a Canadian website that complements the book *Which One Doesn't Belong – A Shapes Book* by Christopher Danielson. No answers are provided for any of the many thought-provoking 'puzzles' that it contains because, for each 'puzzle', there are many different, correct ways of choosing which one doesn't belong. This can support discussion, reason and argument without the focus of a 'correct' answer.
- Rhombus vs Diamond is an illustrated blog, about using WODB examples effectively, by a teacher from Delaware, USA.

Private talk, public conversation

Mike Askew

King's College London

WHY USE THINK, PAIR, SHARE?

The strategy has numerous benefits:

1. Developing a new perspective

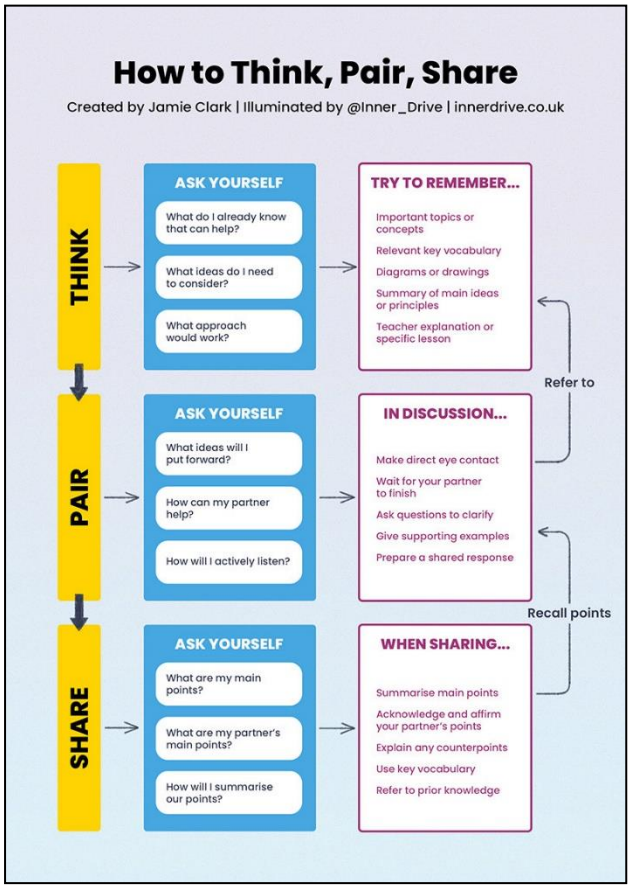
Research suggests if students are working with others, they are more likely to experiment with different techniques when solving a problem. This suggests that the phrase '*two heads are better than one*' certainly has some merit. Students can learn by discussing each other's opinions and reasoning, as this allows them to develop different perspectives of the same task or concept.

2. Increasing student participation

Research has found that Think, Pair, Share can improve students' in-class participation. The combined effect of individual preparation and receiving validation of their ideas from their partner increases students' self-confidence, making them more likely to speak up. This is especially applicable to shy students, as lack of confidence is often their underlying reason for low participation.

3. Learning to take accountability

When students verbalise their ideas to their peers during the Pair and Share stages, they learn to take responsibility for what they say as they become involved in the learning process of their partners and the whole class.



@Inner_Drive

'*Think, Pair, Share* is a popular teaching strategy, encouraging student communication and collaboration.'

Here's why we think it's great and how to use it in your classroom (with thanks to @XpatEducator for allowing us to tweak his original graphic): bit.ly/3NbdXsi

WHAT IS THINK, PAIR, SHARE?

Before we dive into the practical applications, let's take a look at what Think, Pair, Share actually is. Developed by Frank Lyman in the 1990s, this teaching method gets students to go through the following three steps to address a question posed by their teacher:

1. ***Think*** – Each student thinks about the question individually and is encouraged to take notes
2. ***Pair*** – Students pair up to exchange and discuss their ideas
3. ***Share*** – Students share their validated and maybe extended ideas with the whole class

EEF blog: Using Storybooks to Promote High-quality Talk in Maths

Kirstin Mulholland, maths content specialist, explains how storybooks can play an important role in Maths

'Recommendation 2 of the EEF Improving Mathematics in the Early Years and KS1 guidance report offers several practical ideas to integrate purposeful mathematics activities into the school day. This highlights that using storybooks can be particularly effective in providing rich opportunities for mathematical talk.' [November 2022]

EEF blog: Scaffolding High-quality Talk in Maths

Techniques for scaffolding talk in mathematics lessons

Kate Henshall, Head of School Improvement for Trinity MAT and Primary Maths Specialist considers techniques for scaffolding mathematical talk.

'Sentence stems scaffold pupils' talk by supporting them to start a sentence. This enables pupils to concentrate on ***what*** to say rather than ***how*** to say it.

The EEF Improving Mathematics in KS2 and KS3 guidance report highlights how 'discussion and dialogue can be useful tools for developing metacognition, but pupils may need to be taught how to engage in discussion'.

TOLD framework provides four key principles for promoting high-quality talk in maths: ***T****ake part* – ***O****pportunities* – ***L****inks* – ***D****ebate*.

The use of sentence stems is one way that we can support pupils to 'Take Part', by providing scaffolding to prompt and extend their thinking.

EEF blog: Using Worked Examples to Promote High-quality Mathematical Talk

Neil Randall is Head of Mathematics at Etone College, Warwickshire.

PROMOTING HIGH QUALITY TALK IN MATHEMATICS

Education Endowment Foundation

Evidence indicates that high-quality talk can play an important role in supporting learning. This is reflected in multiple recommendations across the EEF's 'Improving Mathematics in the Early Years and Key Stage 1' and 'Improving Mathematics in Key Stages 2 and 3' guidance reports. The 'TOLD' acronym summarises four key principles for encouraging productive talk in mathematics lessons.

TAKE PART

To ensure that all pupils participate in high quality talk, we need to encourage engagement and support the development of listening skills where needed.

This can be achieved by directly inviting contributions from particular pupils. It may also be helpful to establish clear expectations around participation, and to prompt pupils' reflection on the participation of the group, and the quality of discussions.

OPPORTUNITIES

Encouraging children to work on shared problems and tasks can elicit collaboration and discussions around concepts, strategies and ideas. Using storybooks and games can also provide opportunities for rich mathematical discussions.

To maximise opportunities for learning, it is important to plan key questions and discussion points in advance. Open-ended questions such as *'How did you…?* or *'Why does this…?'* are particularly helpful in gathering a range of possible responses from pupils.

LINKS

Support pupils to elaborate upon their own responses, and those of their peers.

Helpful questions to encourage pupils to make links between responses include:

- *'Can you tell me a bit more about…?'*
- *'Can you give me an example to illustrate your point here?'*
- *'Who can build on what has been said here?'*

DEBATE:

Allow pupils to share and explain contrasting opinions and viewpoints.

Teachers can promote debate by:

- Prompting pupils to debate whether key statements are true, false, or sometimes true.
- Providing worked examples to encourage pupils to compare and contrast multiple approaches and strategies.

Further information and guidance can be found in the EEF's 'Improving Mathematics in the Early Years and Key Stage 1' and the 'Improving Mathematics in Key Stages 2 and 3' guidance reports.

eef.li/early-maths

eef.li/maths-ks2-ks3

USING STORYBOOKS TO PROMOTE HIGH QUALITY MATHEMATICAL TALK

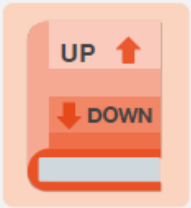
Education Endowment Foundation

Recommendation 2 of the EEF's 'Improving Mathematics in the Early Years and Key Stage 1' guidance report highlights the importance of providing opportunities throughout the day for children to learn about mathematics, and discuss mathematical ideas to extend thinking.

Using storybooks can be one particularly effective way to do this, offering rich opportunities for mathematical talk and questioning. Practitioners should carefully plan how to use storybooks by identifying key questions and discussion points to prompt exploration of specific mathematical concepts.

eef.li/early-maths

There are a number of mathematics story and picture books available across a range of ages that can be powerful in engaging children with mathematical concepts. *Development and Research in Early Math Education* (DREME), an early mathematics research network based at Stanford University, provides evidence-informed guidance for practitioners and parents on choosing books with appropriate mathematical content. It produces 'Storybook Guides' to support effective use of the books, including ways to maximise the mathematical talk.

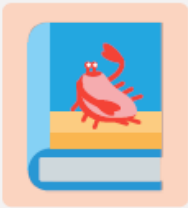


Extract from resource for the storybook 'Inside, Outside, Upside Down' by Stan and Jan Berenstain (1996). Suitable for ages 2–4.

A bear gets in a box that gets turned upside down, taken outside, and put on a truck. Children learn about spatial words.

Mathematical talk during reading:

- Talk about what is happening in the picture, emphasising words that describe spatial relationships—*Do you see Brother Bear getting in the box? Where is the box going? How do you know?*
- Consider opposites—*What is the opposite of going on the truck? What is the opposite of getting inside the box?*
- Make predictions—*What might happen next in the story? If the box is upside down and we turn it around, will it still be upside down?*



Extract from resource for the storybook 'One is a Snail, Ten is a Crab' by April and Jeff Sayre and Randy Cecil (2003). Suitable for ages 5–8.

Each page invites children to count the number of feet that people and different animals have.

Mathematical talk during reading:

- Explore counting the number of feet in different animals—*How many feet does an insect have? Can you show me with your fingers?*
- Practise adding one more—*What happens when we add one foot? How many feet do we have altogether? How do you know?*
- Explore counting by groups of 10—*If we have two crabs, how many feet do they have altogether? How do you know?*

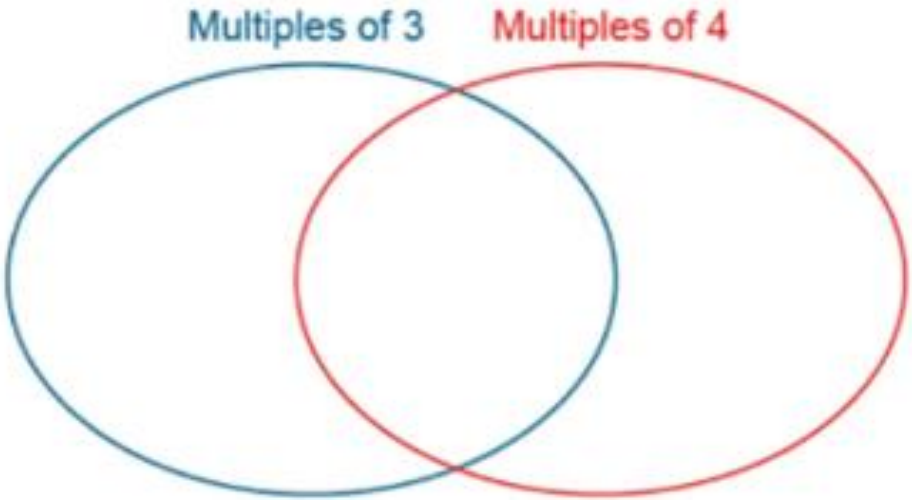
From *Development and Research in Early Math Education*.

Teaching mathematics in primary schools

2. Estimate to fill in the missing numbers.

Framing pupils' reasoning with sentence stems, **'it must be, it can't be, it could be'** can help scaffold talk and debate.

1. Write all of the numbers from 1 to 30 in the correct places on this Venn diagram.



Using open questions such as, **'What's the same, what's different?'** and then scaffolding pupils' responses using the sentence stems **'all, some** and **none'** can support pupils to uncover mathematical structure.

EEF blog: Designing effective professional development design in maths

'In our role as research and innovation workgroup leads for our local Maths Hub, we design professional development for primary maths leads. Our key focus is on supporting disadvantaged pupils through teaching mathematics for mastery.
Here, we share our reflections around how we have used the EEF recommendations to design high quality professional development.' [Tazreen Kassim-Lowe and Rebekah Gear]

Recommendation 1

When designing and selecting professional development, focus on the mechanisms.

Recommendation 2

Ensure that professional development effectively builds knowledge, motivates staff, develops teaching techniques, and embeds practice.