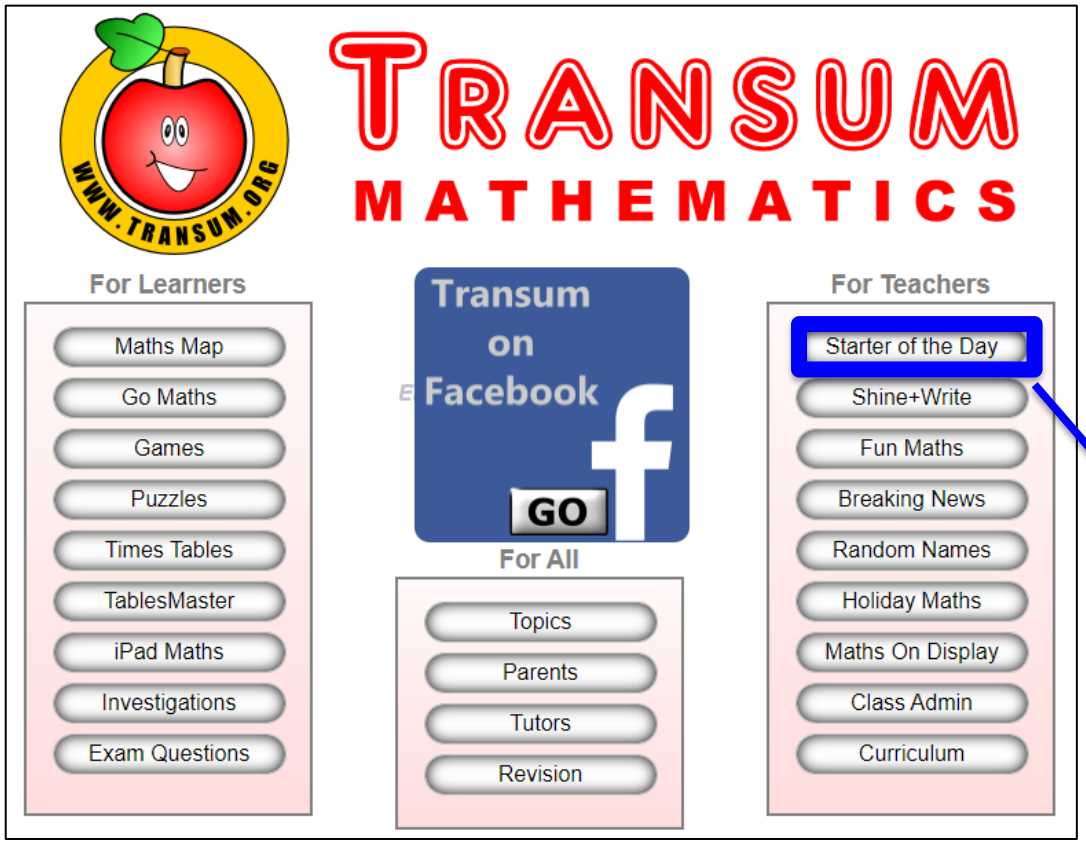
Primary Mathematics Subject Leader Network Meeting (Autumn 2022)

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

Aims

- Review 2022 national assessments (EYFS, KS1 and KS2).
- Consider how research supports mathematics leadership.
- Discuss curriculum developments for mathematics.
- Reflect on the vision and philosophy underpinning mathematics teaching and learning.



*** PLEASE BRING YOUR SCHOOL CALCULATION POLICY (hard copy or electronic version) TO INFORM DISCUSSIONS.**

NATIONAL UPDATES

- 2022 statutory assessments (EYFS, KS1, Y4 MTC and KS2).
- 2023 national curriculum assessment overview.
- DfE and Ofsted updates.
- GLOW Maths Hub.

SUBJECT LEADERSHIP AND PROVISION

- The formative use of 2022 summative assessments.
- Ofsted mathematics research review.
- Subject evaluation.
- NRICH Primary Curriculum overview.
- NCETM Primary Subject Knowledge Audit (and EEF Effective Professional Development).

HOW DO WE MAKE MATHEMATICS TEACHING EQUITABLE FOR ALL PUPILS? STEVE LOMAX (EDUCATION CONSULTANT)

Workshop outline:

- Explore the proactive 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.

HOW OUR 'VISION FOR MATHEMATICS' DRIVES LEADERSHIP, PROVISION AND PUPIL OUTCOMES. PAUL BEECH (MATHEMATICS SUBJECT LEADER, AMBERLEY PAROCHIAL PRIMARY)

CURRICULUM AND PEDAGOGY

- Calculation policy*: progression; manipulatives/representations; and inclusion of FDP.
- NCETM 'Curriculum Prioritisation' materials: case study.
- EEF mathematics guidance: 'Making the most of worked examples'.

Matters Arising: Summer 2022

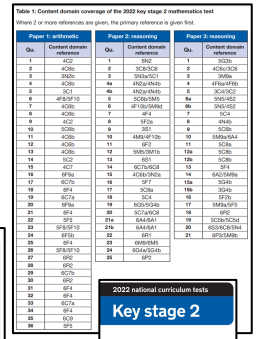
'… full programme of primary tests/assessments will take place during academic year 2021/22 without adaptations … expected standards will remain the same … statutory assessments can be used to help understand more clearly the impact of the pandemic on pupils and schools and how this varies between particular groups of pupils, schools and LA areas.'

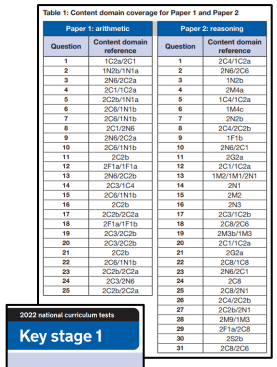
Primary school accountability

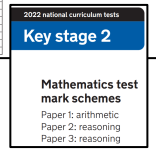
Technical guidance on primary school accountability, school-level progress measures and similar schools.

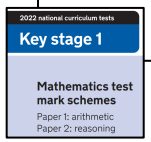
Primary accountability measures - update

Measures for the 2021 to 2022 academic year









FOUR WAYS TO CREATE BETTER MATHEMATICAL TALK IN YOUR CLASSROOM

And resources you might like to explore

Private talk, public conversation
Mike Askew
King's College London

The problem with problem solving in maths (EEF, 14.12.21)
'Maths content specialist, **Kirstin Mulholland**, explores how practitioners can support pupils to problem solve effectively using metacognition.'

Thinking Aloud to support mathematical problem solving (EEF 01.02.22)
'**Kirstin Mulholland** explains how to use *Think Alouds* to scaffold pupils' problem solving in mathematics.'

Using worked examples to support mathematical problem solving (EEF, 11.05.22)
*'**Kirstin Mulholland** explains how to make effective use of worked examples to support pupils' problem solving.'*

EEF blog: Using the debrief to support structured reflection on mathematical problem-solving

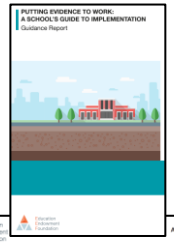
OFSTED: YOUTUBE
OFSTED NEWS

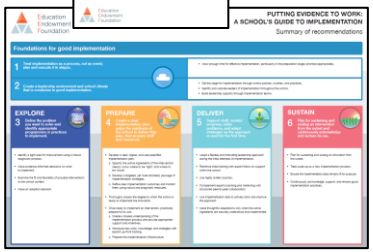
Ofsted Subject Leads talk about their specialisms
Ofsted's subject leads talk about their specialisms and the recent research reviews in their given field.

- A webinar from North West region: mathematics [18:43]
Steve Wren, HMI and subject lead for mathematics, on curriculum, pedagogy and assessment.
- What it means to 'get better' at mathematics [1:35]
Hannah Stoten, HMI and subject lead for early mathematics, talks about Ofsted's mathematics research review and what it means to 'get better' at mathematics.
- Effective mathematics education [2:00]
Hannah Stoten, HMI and subject lead for early mathematics, talks about the mathematics research report and some aspects of what effective education might look like in the classroom.

Guidance
Recovery premium funding
Updated 7 June 2022

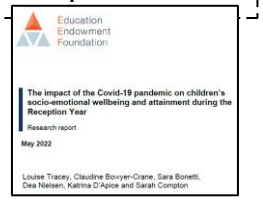
Pupil eligibility and indicative funding rates 2022 to 2023





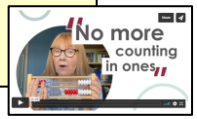
Swindon Village Primary
(Martin Adsett)
- Overview of school developments.
- '@ Home with Number'.

The impact of the COVID-19 pandemic on children's socio-emotional wellbeing and attainment during the Reception Year



SPACES AVAILABLE ON MASTERING NUMBER PROGRAMME FROM SEPTEMBER 2022

GLOW Maths Hub
(Anthony Mitchell, Helen Bowen)
- 'Mastering Number (YR-Y2)' programme.
- CPD opportunities (2022/23).



Steam Mills Primary
(Jen Thomas)
- Ofsted 'Deep Dive' experience.
- Subject leader monitoring.
- Provision for vulnerable pupils.

INTRODUCING MULTIPLICATIVE THINKING

'Building in small steps to ensure all children develop understanding early on in primary school'
[Article, May 2022]

NATIONAL UPDATES

- 2022 statutory assessments (EYFS, KS1, Y4 MTC and KS2).
- 2023 national curriculum assessment overview.
- DfE and Ofsted updates.
- GLOW Maths Hub.

2022 EYFS, KS1 and KS2 Performance Data

Statistics: EYFS profile

EYFSP assessments including breakdowns by pupil characteristics.

Statistics: KS1

Statistics on national curriculum assessments at KS1 and PSC results.

Statistics: KS2

National curriculum assessments and review outcomes at KS2, including measures of progress between KS1 and KS2.

'Provisional results for the 2022 national curriculum assessments at KS2.' [DfE, updated 06.10.22]

Key stage 2 attainment (provisional): 2022

'Provisional information on the 2022 PSC and KS1 assessments, including by pupil characteristics. [DfE, 06.10.22]

Phonics screening check and key stage 1 assessments: England 2022

Release date: **15 December 2022 9:30am (confirmed)**

These statistics will be released on 15 December 2022 9:30am

National statistics announcement

Key stage 2 attainment (revised): 2022

The release date has been changed

Previous date: **17 November 2022 9:30am**

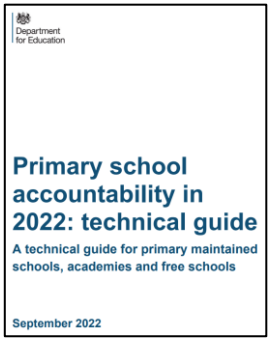
Reason for change: **These statistics will now be released on 24th November to allow for additional time to prepare and quality assure the Multiplication Tables Check data.**

Multiplication tables check attainment: 2022

These statistics will be released on 24 November 2022 9:30am

Primary School Accountability

'Technical guidance on primary school accountability measures.' [DfE, September 2022]


Department for Education

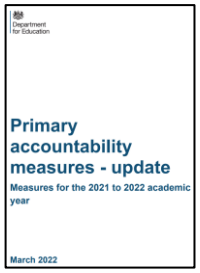
Primary school accountability in 2022: technical guide

A technical guide for primary maintained schools, academies and free schools

September 2022

Primary school accountability

Technical guidance on primary school accountability, school-level progress measures and similar schools.


Department for Education

Primary accountability measures - update

Measures for the 2021 to 2022 academic year

March 2022

DfE guidance, updated 25.03.22

KS2 accountability arrangements for 2021/22

We have announced that the results for academic year 2021/22 will not be published in KS2 performance tables. This is because statutory assessments will be returning for the first time since 2018/19, and without any adaptations, in order to help identify the impact of the pandemic on pupils and schools, as set out above.

This will be a transitional arrangement for the first year in which primary assessments return. We intend to publish primary assessment data in performance tables again for academic year 2022/23. Until this point, KS2 performance data for academic year 2018/19 will continue to be publicly available on Compare school and college performance, with the warning that 2019 data may no longer reflect a school's current performance.

'The Government has also decided that, after two years without KS2 performance data, it is important that we have some school-level data to inform accountability. It is important to have a common understanding of "what" has happened to outcomes at a school to inform professional dialogue on "why" that has happened.
We recognise, however, the uneven impact on schools of the pandemic and the challenges with interpreting the 2021/22 data. We want to ensure the 2021/22 data is used appropriately.'

YR: 2021/22

Area	Gender	Number (ELG 11)		Numerical Patterns (ELG 12)		'Expected' level in mathematics area of learning (overall)	Percentage point gap between G/B achieving 'expected' level
		Emerging	Expected	Emerging	Expected		
England	All	22.2%	77.8%	22.8%	77.2%	75.9%	-
England	G	19.8%	80.2%	20.0%	80.0%	78.7%	5.4 pp
England	B	24.5%	75.5%	25.4%	74.6%	73.3%	
Glos	All	19.9%	80.1%	19.7%	80.3%	78.6%	-
Glos	G	18.3%	81.7%	17.9%	82.1%	80.3%	3.3 pp
Glos	B	21.3%	78.7%	21.3%	78.7%	77.0%	

Source: *LA NCER database*

KS1 Attainment

Subjects	EXS+ / GDS: National (Glos LA)		
	2018	2019	**2022**
Reading	76% / 25% (75% / 25%)	75% / 25% (75% / 26%)	**67% / 18%** **(68% / 19%)**
Writing	68% / 16% (66% / 14%)	69% / 15% (69% / 15%)	**58% / 8%** **(58% / 8%)**
Mathematics	75% / 21% (74% / 18%)	76% / 22% (75% / 20%)	**68% / 15%** **(68% / 16%)**
Science	83% (84%)	83% (84%)	**77%** **(80%)**

Source: *DfE Statistics*

KS2 Attainment

Subjects	% EXS+ / % High* or GDS*: National (Glos LA)		
	2018	2019	**2022**
RWM combined	61% / 9% (62% / 9%)	65% / 11% (63% / 10%)	**59% / 7% (57% / 6%)**
Reading	72% / 25% (75% / 29%)	73% / 27% (76% / 30%)	**74% / 28% (75% / 30%)**
Writing	76% / 18% (74% / 17%)	78% / 20% (77% / 20%)	**69% / 13% (68% / 11%)**
Mathematics	75% / 23% (76% / 23%)	79% / 27% (74% / 22%)	**71% / 22% (70% / 21%)**
GPS	77% / 31% (77% / 31%)	78% / 36% (77% / 33%)	**72% / 28% (73% / 28%)**
Science	82% (82%)	83% (82%)	**78% (80%)**

* 'High standard': scaled score of 110+. GDS: writing TA only.

Source: *DfE Statistics*

Collection

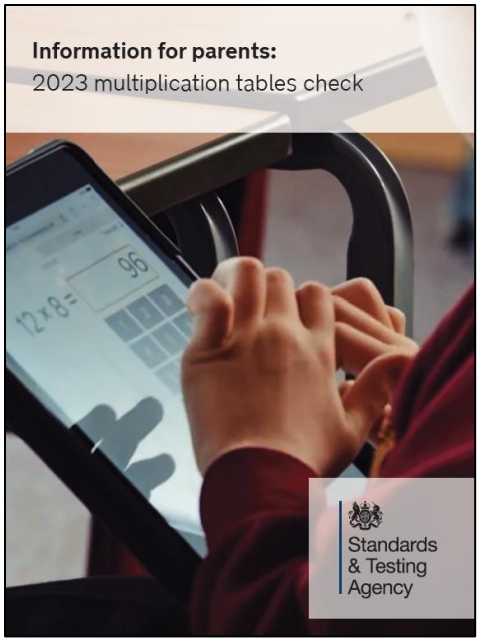
Multiplication tables check

‘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.’
For queries, please contact the national curriculum assessments helpline on 0300 303 3013 or email assessments@education.gov.uk.



2023 Statutory Assessments

Collection

National curriculum assessments: key stage 2 tests

Use this information to:

- check important dates for the key stage 2 test cycle
- understand your statutory requirements for the key stage 2 tests
- use appropriate access arrangements
- administer the tests
- keep test materials secure
- access your school's test results

Your school will also receive printed copies of the test administration instructions with the test materials. These are not available on GOV.UK as they contain live test material. Details on the format, equipment and assistance that must be used for each test is available in the test administration guidance.

You will also receive the 'Attendance register and test script dispatch instructions' with your stationery pack .

Contents

'Guidance for HTs, teachers and test administrators involved in administering KS1/KS2 national curriculum tests.' [October 2022]

Collection

National curriculum assessments: key stage 1 tests

Guidance for headteachers, teachers and test administrators involved in administering the national curriculum tests for key stage 1.

Contents

2023 Statutory Assessments

Key stage 1 assessment and reporting arrangements

October 2022

‘Statutory guidance for assessing and reporting the national curriculum at key KS1/KS2 in the 2022/23 academic year.’

Key stage 2 assessment and reporting arrangements

October 2022

Key stage 1 access arrangements guidance

October 2022

Key stage 2 access arrangements guidance

October 2022

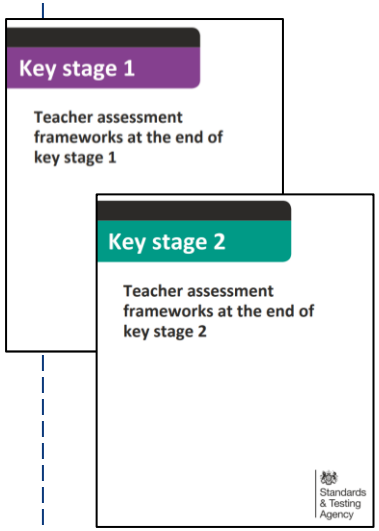
‘Guidance for schools about access arrangements available for pupils participating in 2023 KS1/KS2 national curriculum tests.’

Key stage 2 tests: varying the test timetable

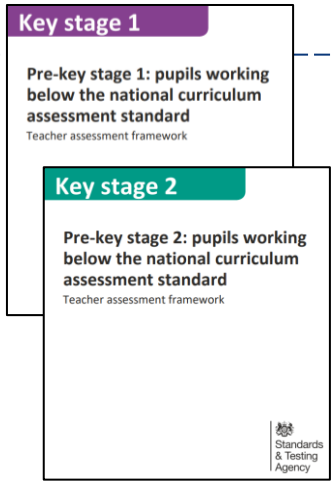
‘Information about how HTs, or someone with delegated authority, can re-schedule the KS2 tests.’

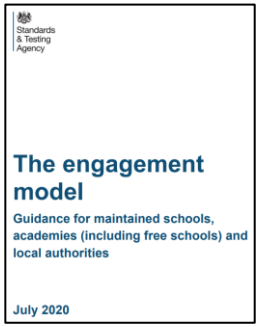
‘Guidance for schools and LAs involved in the administration and moderation of statutory KS1 TA in 2023.’

‘For teachers to make statutory TA judgements for pupils at the end of KS1/KS2.’
The frameworks are designed for pupils who are working at the standard of national curriculum (NC) assessments.



‘Pre-key stage standards are for pupils who are working below the overall standard of (KS1/KS2) NC assessments, but who are engaged in subject-specific study.’





‘The engagement model is the assessment for pupils working below the standard of NC assessments and not engaged in subject-specific study at KS1 and KS2.’

END OF KS1 TEACHER ASSESSMENT AND MODERATION CPD

THIS CPD ENABLES Y2 TEACHERS TO UNDERTAKE END OF KS1 STATUTORY ASSESSMENTS

SESSION CONTENT

Introduction
- 2023 KS1 assessment overview
- 2023 KS1 Assessment and Reporting Arrangements (ARA)

Writing
- Key messages (STA guidance):
  - a more flexible approach
  - a greater emphasis on composition
  - independent writing
  - spelling, and
  - handwriting
- 2023 KS1 moderator training materials and writing exemplifications
- Evidence for writing

Reading
- Teacher assessment (TA) frameworks and national exemplification materials
- Evidence for reading

Mathematics
- TA frameworks and national exemplification materials
- Evidence for mathematics

Science
- TA frameworks and national exemplification materials
- Guidance on making accurate teacher assessment judgements

AIMS

TO OUTLINE THE STATUTORY REQUIREMENTS OF 2023 END OF KS1 TEACHER ASSESSMENT

TO SUPPORT ROBUST AND ACCURATE EVIDENCE-BASED ASSESSMENT IN ENGLISH READING, ENGLISH WRITING, MATHEMATICS AND SCIENCE

Training event	Audience	Dates	Venue	Timings	Price
End of KS1	Teachers and or senior leaders	Mon 30 Jan 2023 Tues 31 Jan 2023 Mon 6 Feb 2023	The Pavilion, Hatherley Road, Cheltenham	All day event 9.15am-4pm	£95 per delegate

END OF KS2 TEACHER ASSESSMENT AND MODERATION CPD

THIS CPD ENABLES Y2 TEACHERS TO UNDERTAKE END OF KS2 STATUTORY ASSESSMENTS

SESSION CONTENT

Introduction
- 2023 KS2 assessment overview
- 2023 KS2 Assessment and Reporting Arrangements (ARA)

Writing
- Key messages (STA guidance):
  - a more flexible approach
  - a greater emphasis on composition
  - independent writing
  - spelling, and
  - handwriting
- 2023 KS2 moderator training materials and writing exemplifications
- Evidence for writing

Reading
- 2023 Teacher assessment (pre-KS2 standards); and
- 2023 National Curriculum Tests

Mathematics
- 2023 teacher assessment (pre-KS2 standards); and
- 2023 National Curriculum Tests

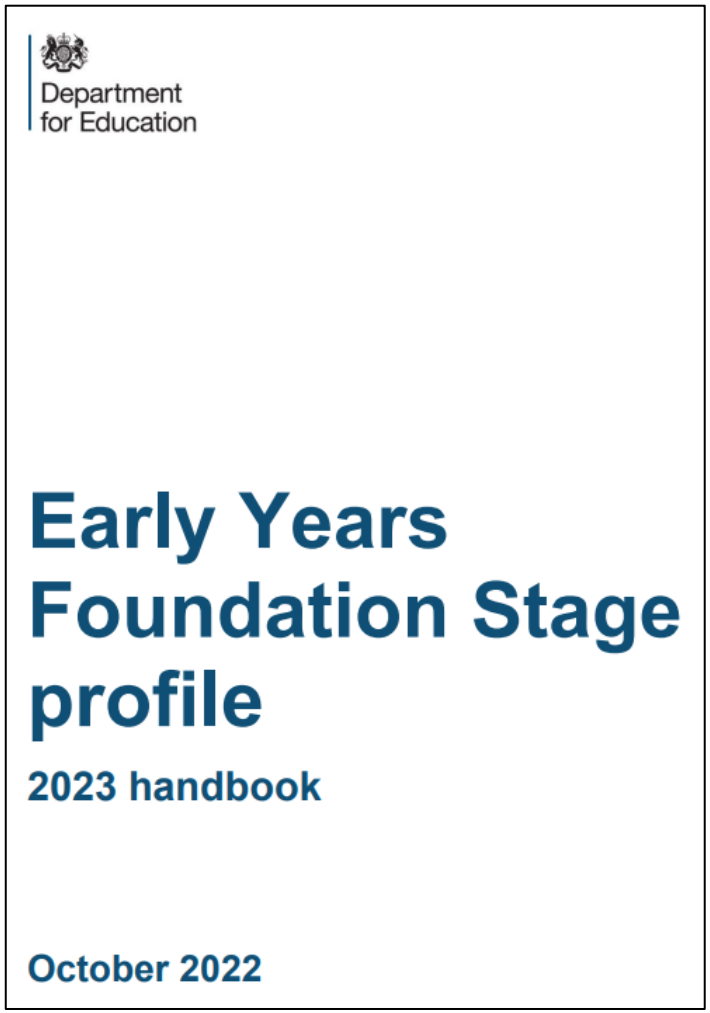
Science
- TA frameworks and national exemplification materials
- Guidance on making accurate teacher assessment judgements

AIMS

TO OUTLINE THE STATUTORY REQUIREMENTS OF 2023 END OF KS2 TEACHER ASSESSMENT

TO SUPPORT ROBUST AND ACCURATE EVIDENCE-BASED ASSESSMENT IN ENGLISH READING, ENGLISH WRITING, MATHEMATICS AND SCIENCE

Training event	Audience	Dates	Venue	Timings	Price
End of KS2	Teachers and or senior leaders	Mon 13 Feb 2023 Tues 14 Feb 2023 Mon 1 March 2023	The Pavilion, Hatherley Road, Cheltenham	All day event 9.15am-4pm	£95 per delegate



‘This handbook supports EYFS practitioners in making accurate judgements about each child's attainment.’

DfE want to hear your views and experiences of implementing the 2021 EYFS reforms

The DfE has commissioned IFF Research to conduct an important national study to understand how the most recent reforms to the Early Years Foundation Stage (EYFS) have been implemented by early years providers and what the impacts have been.

Leaders, staff, and childminders at selected settings will be emailed by IFF research inviting you to participate in a short, 10-minute online survey. This survey will ask about your experiences of implementing the reforms, including any barriers you may have faced or additional support you think you would have benefited from. Your responses will reported in aggregate to the DfE, which means that nothing you say will be attributable to you or your setting.

DfE want the findings to be representative of different types of early years settings, so it is vital that a wide range of providers take part. Everyone who takes part will help DfE to build a better understanding of the impact that the reforms have had. DfE will use your insights to inform options for possible further action and support in the EYFS, and the findings from this research will be published on gov.uk in due course. The survey will launch Monday 31 October and close on Friday 9 December. **This is your opportunity to make your views count.**

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.

Ofsted's approach to evaluating the curriculum

School inspection handbook

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

- 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 experiences in later life;
  - is planned and sequenced so that the end points that it is building towards are clear and that pupils develop the knowledge and skills, building on what has been taught before, to be able to reach those end points;
  - has rigour, where relevant, so that pupils learn the knowledge that they need to answer subject-specific questions and to gain disciplinary knowledge of how the subject works (this should not prevent a topic-based or thematic approach, however);
  - accounts for delays and gaps in learning that have arisen and continue to arise as a result of the pandemic; and
  - remains as broad as possible for as long as possible, including when delivered remotely … [T]the school does not offer disadvantaged pupils or pupils with SEND a reduced curriculum.
- teachers:
  - have expert knowledge of the subjects that they teach and are supported, where necessary, to address gaps in their knowledge so that pupils are not disadvantaged by ineffective teaching;
  - present information clearly, promote appropriate discussion, check pupils' understanding systematically, and identify misunderstandings and adapt teaching as necessary to correct these;
  - deliver the subject curriculum in a way that allows pupils to transfer key knowledge to long-term memory. Teaching is sequenced so that new knowledge and skills build on what has been taught before and pupils can work towards clearly defined end points;
  - use assessment to check pupils' understanding to inform teaching, and to help pupils embed key concepts, use knowledge fluently and develop their understanding, and not simply memorise disconnected facts;
  - consider the most important knowledge or concepts that pupils need to know and focus on these, and prioritise feedback, retrieval practice and assessment; and
  - ensure that remote education, if needed, enables all pupils to access lessons and learn, and monitor pupils' engagement and communicate with parents and colleagues effectively if there are concerns.
- all pupils, particularly disadvantaged pupils and those with SEND:
  - acquire the knowledge and cultural capital they need to succeed in life;
  - make progress, in that they know more, remember more and are able to do more. They are learning what is intended in the curriculum;
  - produce work of high quality;
  - achieve well in national tests and examinations, where relevant;
  - are being prepared for their next stage of education, training or employment at each stage of their learning, including whether pupils in sixth form are ready for the next stage and are going on to appropriate, high-quality destinations; and
  - are able to read to an age-appropriate level and fluency (if not, they will be incapable of accessing the rest of the curriculum, and they will fall rapidly behind their peers).' [*Para 214*]

Pupil premium: overview

Updated 27 October 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](#) (p7).

Department for Education

Using pupil premium: guidance for school leaders

March 2022

Pupil premium strategy statement template and (three) example statements have been updated.

Pupil premium strategy statement – [insert school name]

Before completing this template, read the Education Endowment Foundation's guidance on using your pupil premium funding effectively and DfE's using pupil premium guidance, which includes the 'menu of approaches'. It is for school leaders to decide what activity to spend their pupil premium (and recovery premium) on, within the framework set out by the menu.

All schools that receive pupil premium (and recovery premium) are required to use this template to complete and publish a pupil premium statement on their school website by 31 December every academic year.

If you are starting a new pupil premium strategy plan, use this blank template. If you are continuing a strategy plan from last academic year, you may prefer to edit your existing statement.

Before publishing your completed statement, delete the instructions (text in italics) in this template, including this text box.

Approaches that you could implement	
High-quality teaching	Developing high quality teaching, assessment and a curriculum which responds to the needs of pupils
	Professional development on evidence-based approaches, for example feedback, metacognition, reading comprehension, phonics or mastery learning
	Mentoring and coaching
	Recruitment and retention of teaching staff
	Technology and other resources focussed on supporting high quality teaching and learning
Targeted academic support	Interventions to support language development, literacy, and numeracy
	Activity and resources to meet the specific needs of disadvantaged pupils with SEND
	Teaching assistant deployment and interventions
	One to one and small group tuition
	Peer tutoring
Wider strategies	Supporting pupils' social, emotional and behavioural needs
	Supporting attendance
	Extracurricular activities, including sports, outdoor activities, arts, culture and trips
	Extended school time, including summer schools
	Breakfast clubs and meal provision
	Communicating with and supporting parents

Guidance

Recovery premium funding

Updated 7 June 2022

Pupil eligibility and indicative funding rates 2022 to 2023

Contents

‘For mainstream schools, pupil eligibility will be the same as in 2021/22.’

Funding rates

Recovery premium allocations will be calculated on a per pupil basis, based on the following indicative rates:

Mainstream education:

- £145 per eligible pupil in primary schools
- £276 per eligible pupil in secondary schools

Other eligible schools, and special education units in mainstream schools:

- £290 per pupil in primary education
- £552 per pupil in secondary education

We have included a minimum payment that we refer to as a ‘floor’ to ensure that:

- an eligible primary school will not receive less than £2,000
- an eligible secondary, or all-through school, will not receive less than £6,000

Using recovery premium funding

Schools should spend this premium on evidence-based approaches to support pupils. In line with the Education Endowment Foundation’s pupil premium guide, activities should include those that:

- support the quality of teaching
- provide targeted academic support
- deal with non-academic barriers to success in school, such as attendance, behaviour and social and emotional support

Like the pupil premium, schools can:

- spend the recovery premium on a wider cohort of pupils than those who are eligible for the funding
- direct recovery premium spending where they think the need is greatest

For further information, read our guidance on using pupil premium.

The recovery premium conditions of grant for the 2022 to 2023 academic year state that schools must not use the grant to meet their portion of the costs of tuition provided through the National Tutoring Programme (NTP). Schools should meet those costs from their existing sources of income, such as core funding and pupil premium. Recovery premium is additional funding to provide further education recovery support on top of the subsidised NTP offer.

National Tutoring Programme: guidance for schools, 2022 to 2023

Updated 5 September 2022

'Information for school leaders on how to provide tuition for pupils through the NTP in the 2022/23 academic year.'

Press release

£200 million of funding announced to address the disadvantage gap

'*The DfE has confirmed its re-endowment of the EEF with a grant of £137m to put it on a long-term footing and continue its work as an independent evidence broker, evaluating and spreading best practice … for at least another decade.*'

Press release

Better assessment needed to get the most out of tutoring

Ofsted has today published the first of 2 independent reviews of the government's flagship tutoring programme in schools and further education providers.

SCHOOLS WEEK

Schools 'don't really know' if tutoring is working, Ofsted finds

School inspectorate says most schools had not been assessing tuition effectively

Research and analysis

Independent review of tutoring in schools and 16 to 19 providers

Ofsted's independent review of tutoring in schools and 16 to 19 providers.

Blog

The Education Hub

Organisations: Department for Education

How tutoring is working in schools

Research and analysis

National Tutoring Programme year 2: implementation and process evaluation

Findings from the independent evaluation of the second year of the National Tutoring Programme (2021 to 2022 academic year).

SUBJECT LEADERSHIP AND PROVISION

- The formative use of 2022 summative assessments.
- Ofsted mathematics research review.
- Subject evaluation.
- NRICH Primary Curriculum overview.
- NCETM Primary Subject Knowledge Audit (and EEF Effective Professional Development).

TAKING ON THE ROLE OF MATHS LEAD IN A PRIMARY SCHOOL

'Ten tips for newcomers to the position'

[Article, May 2022]

'Are you about to take on the role of maths lead in your primary school? Or perhaps you're already doing the job but open to new ideas. We realise that the time you have to devote to the role will depend on other commitments and the size of your school will also be a factor. But we hope there's something in the ideas below that'll help you support your colleagues in their maths teaching next year.'

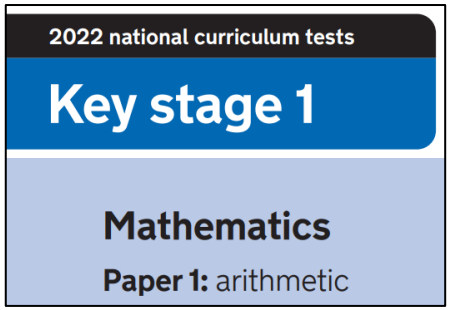
1. **Create a baseline**
2. **Make a plan for the year**

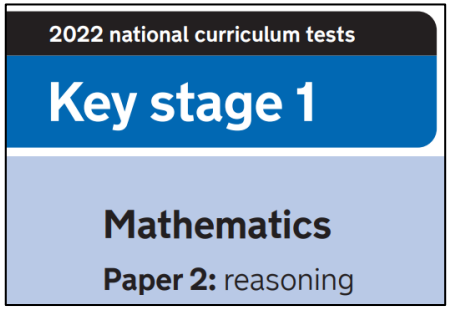
What improvements would you like to see by the end of the school year? Make a plan for:

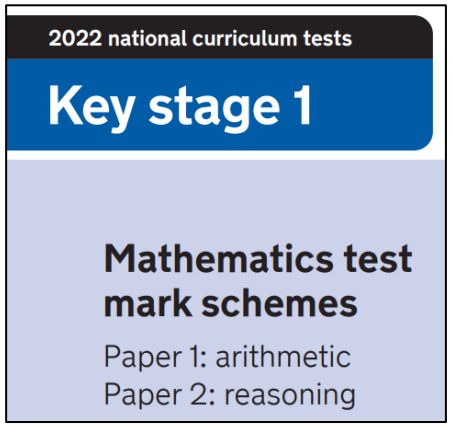
- when you'll explain your aims to colleagues;
- how you'll support teachers to implement changes;
- how and when you'll monitor progress towards the goal; and
- how you'll share the evidence of success later in the year.

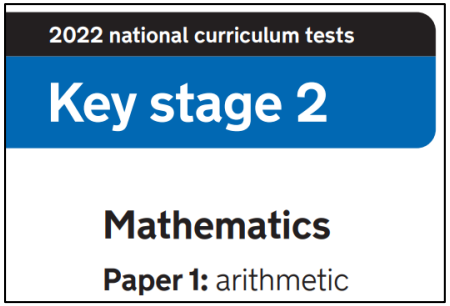
3. **One thing at a time**
4. **Have your lunch with pupils**
5. **Teacher/TA voice**
6. **Timing of book looks**
7. **Visit lessons**
8. **Have a weekly drop-in hour to talk maths**
9. **Work with and alongside colleagues**
10. **Get support for yourself**

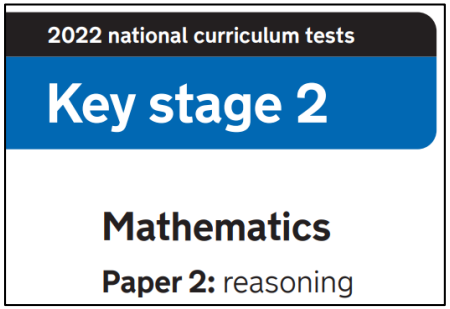
2022 KS1/KS2 National Curriculum Tests

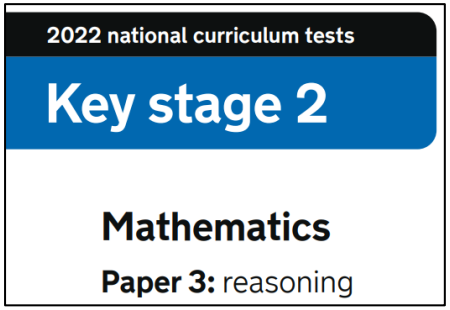


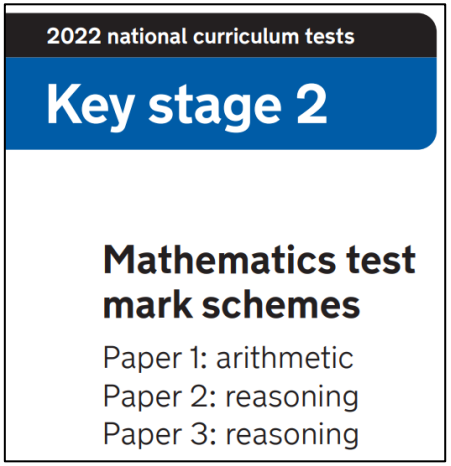












2022 national curriculum tests

Key stage 1

Mathematics test mark schemes

Paper 1: arithmetic
Paper 2: reasoning

Table 1: Content domain coverage for Paper 1 and Paper 2

Paper 1: arithmetic	
Question	Content domain reference
1	1C2a/2C1
2	1N2b/1N1a
3	2N6/2C2a
4	2C1/1C2a
5	2C2b/1N1a
6	2C6/1N1b
7	2C6/1N1b
8	2C1/2N6
9	2N6/2C2a
10	2C6/1N1b
11	2C2b
12	2F1a/1F1a
13	2N6/2C2b
14	2C3/1C4
15	2C6/1N1b
16	2C2b
17	2C2b/2C2a
18	2F1a/1F1b
19	2C3/2C2b
20	2C3/2C2b
21	2C2b
22	2C6/1N1b
23	2C2b/2C2a
24	2C3/2N6
25	2C2b/2C2a

Paper 2: reasoning	
Question	Content domain reference
1	2C4/1C2a
2	2N6/2C6
3	1N2b
4	2M4a
5	1C4/1C2a
6	1M4c
7	2N2b
8	2C4/2C2b
9	1F1b
10	2N6/2C1
11	2G2a
12	2C1/1C2a
13	1M2/1M1/2N1
14	2N1
15	2M2
16	2N3
17	2C3/1C2b
18	2C8/2C6
19	2M3b/1M3
20	2C1/1C2a
21	2G2a
22	2C8/1C8
23	2N6/2C1
24	2C8
25	2C8/2N1
26	2C4/2C2b
27	2C2b/2N1
28	2M9/1M3
29	2F1a/2C8
30	2S2b
31	2C8/2C6

Table 1: Content domain coverage of the 2022 key stage 2 mathematics test

Where 2 or more references are given, the primary reference is given first.

Paper 1: arithmetic	
Qu.	Content domain reference
1	4C2
2	4C6b
3	3N2b
4	4C6b
5	3C1
6	4F8/5F10
7	4C6b
8	4C6b
9	4C2
10	5C6b
11	4C6b
12	4C6b
13	4C6b
14	5C2
15	4C7
16	6F9a
17	6C7b
18	6F4
19	6C7a
20	6F9a
21	6F4
22	5F5
23	5F8/5F10
24	6F5b
25	6F4
26	5F8/5F10
27	6R2
28	6R2
29	6C7b
30	6R2
31	6F4
32	6F4
33	6C7a
34	6F4
35	6C9
36	5F5

Paper 2: reasoning	
Qu.	Content domain reference
1	6N2
2	3C8/3C6
3	5N3a/5C1
4a	4N2a/4N4b
4b	4N2a/4N4b
5	5C6b/5M5
6	4F10b/5M9d
7	4F4
8	5F2a
9	3S1
10	4M9/4F10b
11	6F2
12	5M5/3M1b
13	6S1
14	6C7b/6C8
15	4C6b/3N2a
16	5F7
17	5C8a
18	5C4
19	6G5/5G4b
20	5C7a/6C8
21a	6A4/6A1
21b	6A4/6A1
22	6R1
23	6M9/6M5
24	6G4a/5G4b
25	6P2

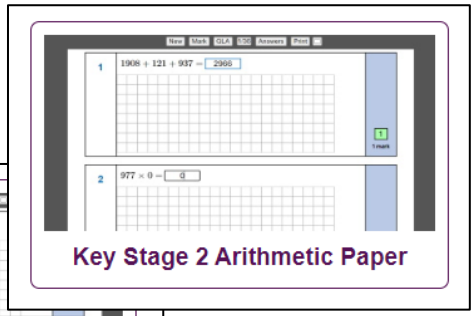
Paper 3: reasoning	
Qu.	Content domain reference
1	5G3b
2	4C6c/3C6
3	3M9a
4	4F6a/4F6b
5	3C4/3C2
6a	5N5/4S2
6b	5N5/4S2
7	5C4
8	4N4b
9	5C6b
10	5M9a/6A4
11	5C8a
12a	5C8b
12b	5C8b
13	5F4
14	6A2/5M9a
15a	5G4b
15b	3G4b
16	5F2b
17	5M9a/5F5
18	6R2
19	5C5b/5C5d
20	6S3/6C8/5N4
21	6P3/5M9b

2022 national curriculum tests

Key stage 2

Mathematics test mark schemes

Paper 1: arithmetic
Paper 2: reasoning
Paper 3: reasoning



Key Stage 2 Arithmetic Paper

Key Stage 1 Arithmetic Paper

Ofsted YouTube: mathematics guidance

OFSTED: YOUTUBE
OFSTED NEWS

Ofsted Subject Leads talk about their specialisms
Ofsted's subject leads talk about their specialisms and the recent research reviews in their given field.

- A webinar from North West region: mathematics [18:43]

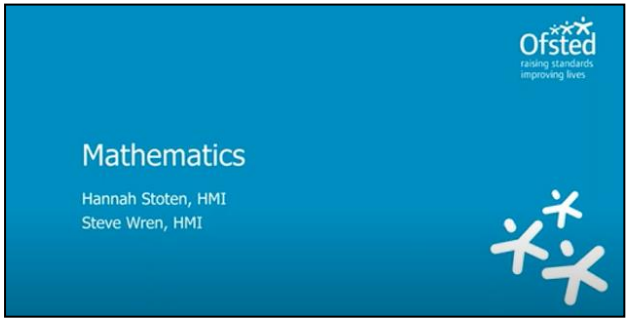
Steve Wren, HMI and subject lead for mathematics, on curriculum, pedagogy and assessment.

- What it means to 'get better' at mathematics [1:35]

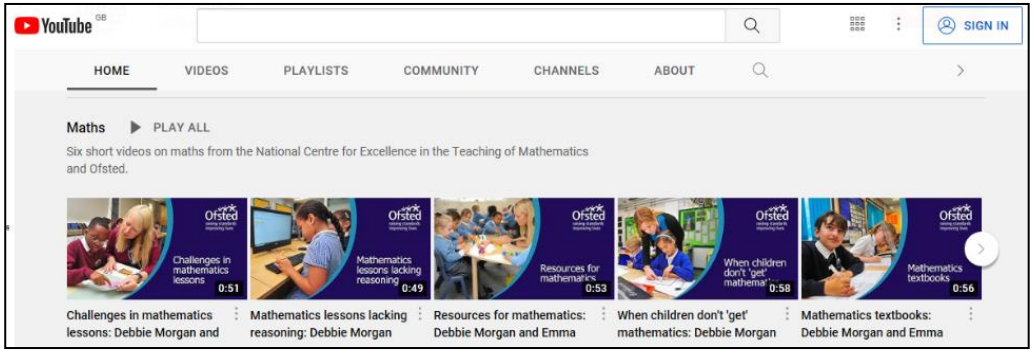
Hannah Stoten, HMI and subject lead for early mathematics, talks about Ofsted's mathematics research review and what it means to 'get better' at mathematics.

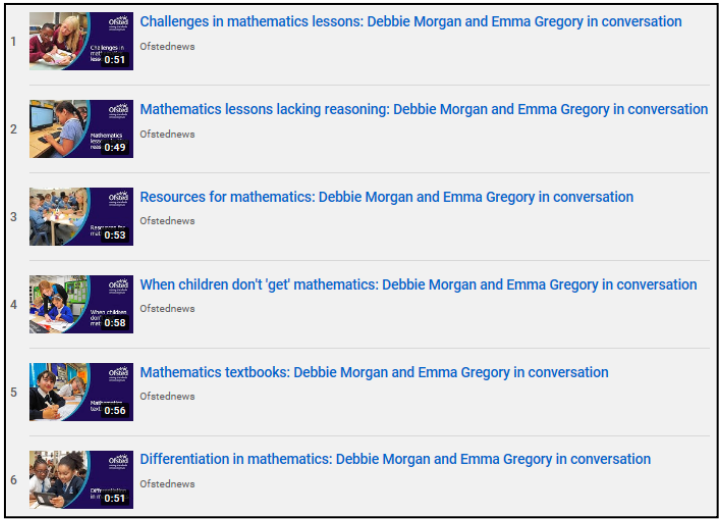
- Effective mathematics education [2:00]

Hannah Stoten, HMI and subject lead for early mathematics, talks about the mathematics research report and some aspects of what effective education might look like in the classroom.



Steve Wren, HMI and Subject Lead for Mathematics, on curriculum, pedagogy and assessment.





Ofsted
raising standards
improving lives

Mathematics

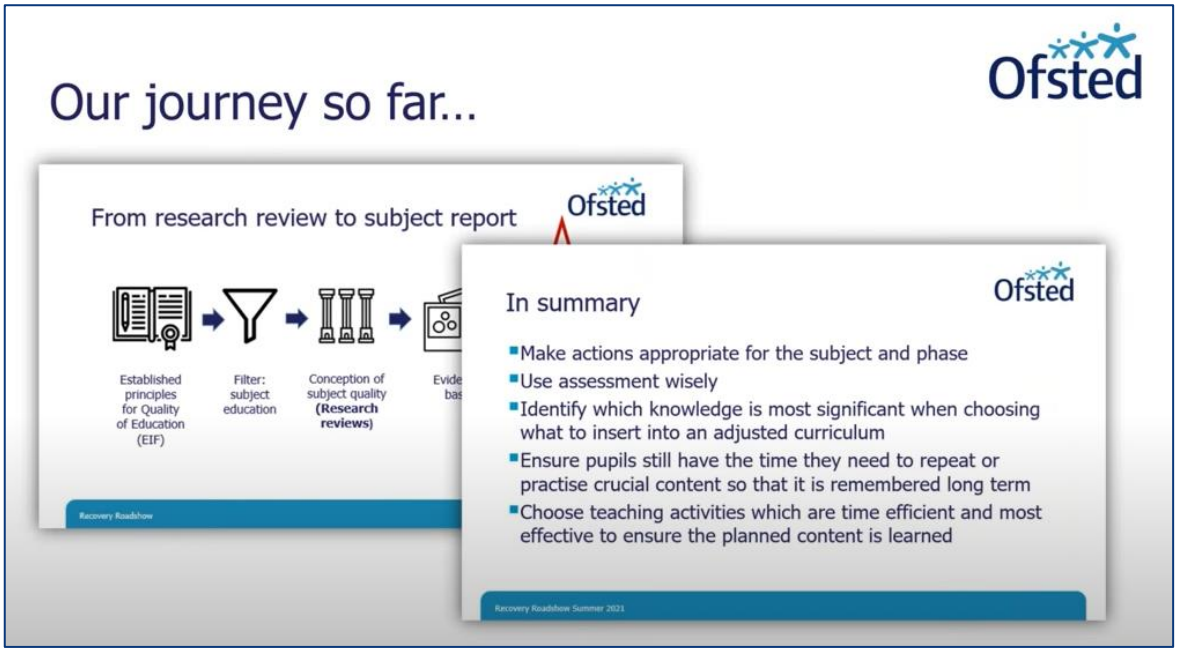
Hannah Stoten, HMI
Steve Wren, HMI

A webinar from the North-West region: mathematics

Steve Wren, HMI and subject lead for mathematics, on curriculum, pedagogy and assessment [November 2021]

A session about how pupils make progress in mathematics and how the principles of catch-up might apply to maths.

The messages will replicate much of the content in Ofsted's research review (May 2021).



Marc Hayes (Assistant HT/Y6 teacher, Leeds) has provided a summary of the Ofsted mathematics research review (May 2021):

- defining mathematical knowledge;
- organising the curriculum;
- setting the foundations in YR;
- ambition for all;
- teaching problem solving;
- mastering 'microsteps';
- reducing 'cognitive load';
- scaffolding;
- testing 'effective-ly'; and
- implications for leaders.

Reducing Cognitive Load

- Reduce the need for pupils to spend lots of time making choices as this splits their attention.
- Consider any imagery you use during lessons as non-content related imagery can be a distraction.
- Break down composite skills into their component parts and provide opportunities for children to practise these before practising the composite skill.
- The classroom environment should support periods of sustained concentration. The ideal level of noise is almost silence, particularly for children under 13, and those with SEND.

IMPLICATIONS FOR LEADERS

1. Be ambitious and expect all pupils to be successful.
2. Ensure sufficient, dedicated time for maths.
3. Ensure that bookwork is of a high quality.
4. Methods and presentation rules should be taught and rehearsed to automaticity.
5. Problem solving needs to be taught explicitly to all learners.
6. Support novice teachers to teach maths effectively by providing robust support: do not leave them to develop their own ways of teaching from scratch.
7. Have systematic plans to build models of instruction and rehearsal over time.
8. Teachers across phases benefit from renewing and improving their subject knowledge.

Links to **Third Space Learning** guidance:

- Quality first teaching
- Effective questioning

'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

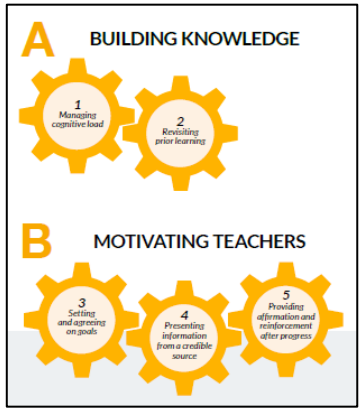
uals and groups, such as pupils
small sample of these pupils, how
upils with **SEND**, children looked
eds. In order to do this,
pupils and consider the way the
child receives the support they
opriate reasonable adjustments
D code of practice.'

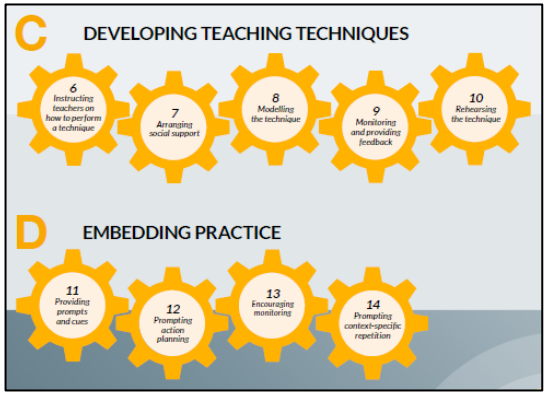
250. 'Inspectors will gather and evaluate evidence about …
… whether leaders are suitably ambitious for all pupils with SEND;
… how well leaders identify, assess and meet the needs of pupils with SEND, including when pupils with SEND are self-isolating and/or receiving remote education;
… how well leaders 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.]

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.





USING THE NCETM CURRICULUM PRIORITISATION MATERIALS

'A maths lead tells his school's story.' [Article, August 2022]

'There's no single, perfect way for every primary school to organise its maths planning and teaching. But more and more schools are using the NCETM Curriculum Prioritisation materials for this purpose.

Craig Tilstone is maths lead and Y5 teacher at **The Flying High Academy**, Ladybrook, Mansfield. He is an NCETM Mastery Specialist, working with East Midlands West Maths Hub and the school has been using a teaching for mastery approach since 2015.

The school has two-form entry and 35% of pupils are in receipt of FSM. At the end of the 2022 summer term, Craig sent us this account of how his school began using the materials in 2021/22.'

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

These tasks, chosen from our summer challenges, are particularly suitable for the start of term, when you are getting to know your learners

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 @nrichmaths

NRICH maths
@nrichmaths · 52m

Thanks @ArmstrongMelis. Delighted to read about 'Ring a Ring of Numbers' helping to encourage dialogue and resilience in #maths class.

If other classes would like to explore it too, here's the activity, teacher notes and more examples of classwork nrich.maths.org/2782

Melissa ... @Armstr... · 15h

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

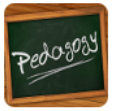
The features on this page are linked to the three aims of the National Curriculum - number fluency, reasoning and problem solving.

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.

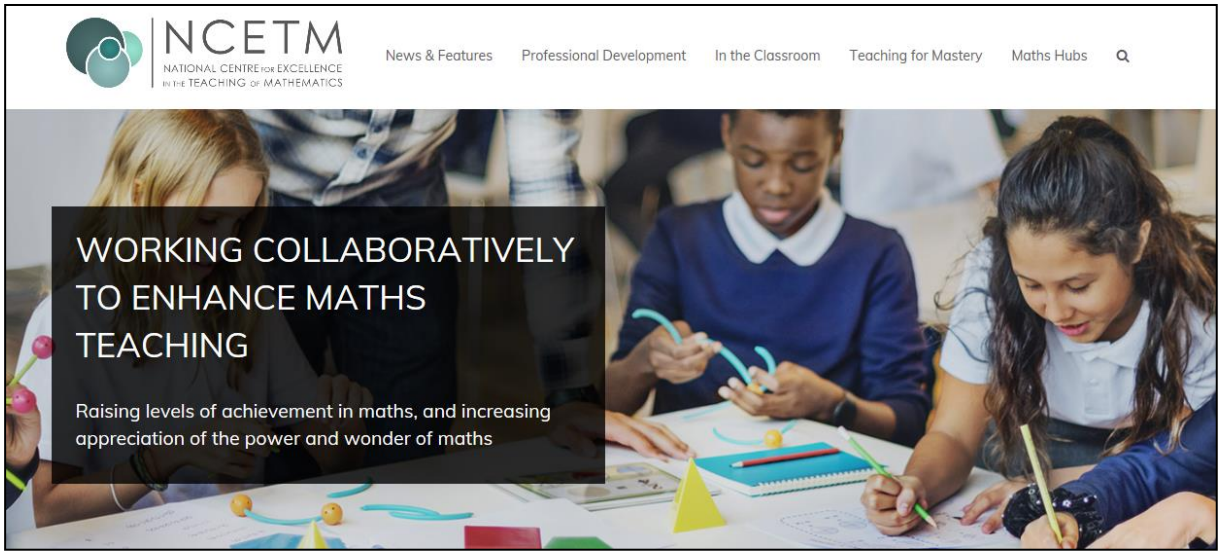
Being Collaborative - Primary

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.

NCETM WEBSITE




Professional Development


In the Classroom


Teaching for Mastery


Maths Hubs

LATEST NEWS

LATEST VIDEOS

TEACHING FOR MASTERY

Mastery Explained

Evidence, exemplification and illustration to explain the mastery approach

Mastery Materials

Materials to help teachers develop a mastery approach in their classrooms and schools

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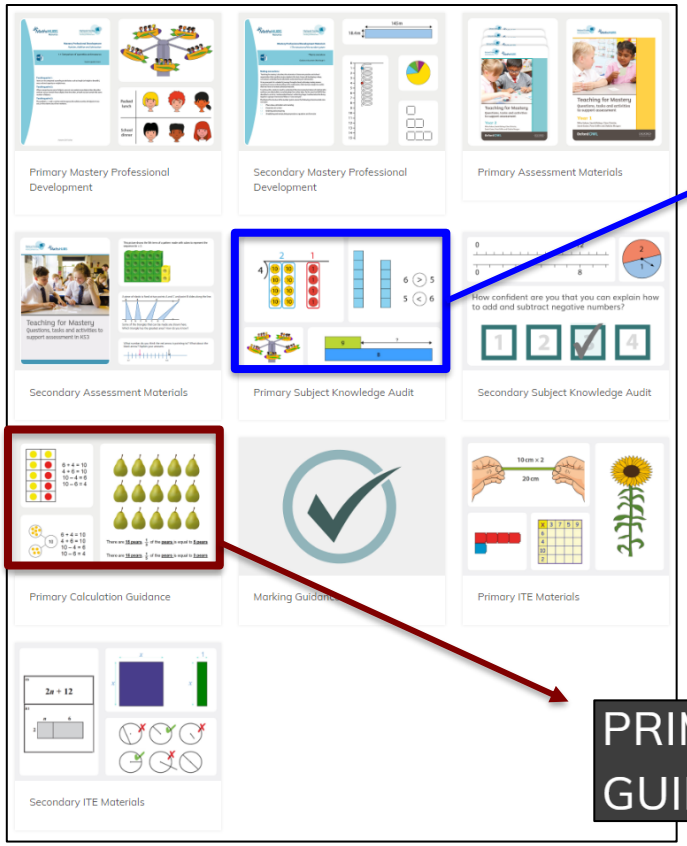
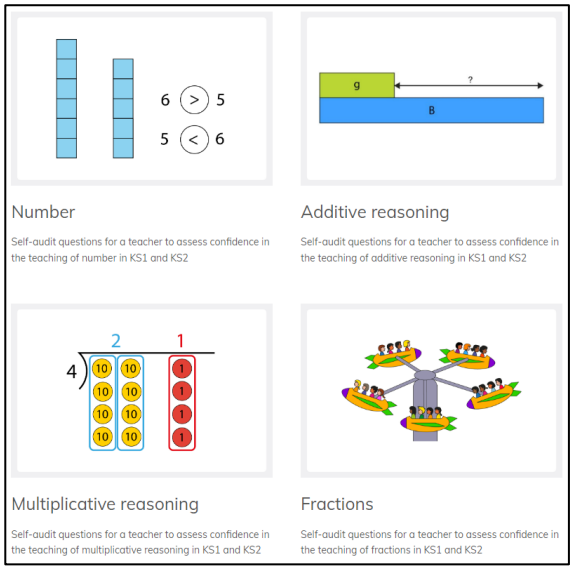
Explore our opportunities to join a Work Group or become a Mastery Specialist

MASTERY MATERIALS



PRIMARY SUBJECT KNOWLEDGE AUDIT

'Assess your confidence in teaching the content of the KS1 and KS2 maths curriculum.'



PRIMARY CALCULATION GUIDANCE

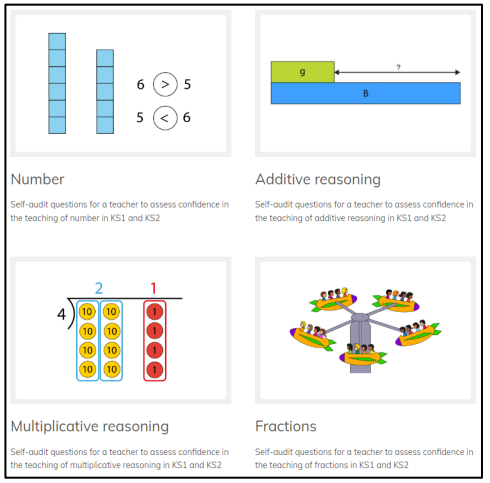
PRIMARY SUBJECT KNOWLEDGE AUDIT

NUMBER

ADDITIVE REASONING

MULTIPLICATIVE REASONING

FRACTIONS



‘Effective subject knowledge of maths underpins high-quality teaching. For any teachers in training or new to the profession, or anyone simply wanting to find out more about the maths taught in primary schools, these subject audits can help.

The materials are divided into four mathematical areas with up to twelve ‘question documents’ in each area, all drawing heavily on the **NCETM Primary Mastery Professional Development materials**.

Each document starts by asking you how confident you are in supporting children’s learning in a specific area of maths. Examples are provided to prompt your initial thinking, which you can then refer to while reading detailed notes on how this area might be taught in a primary classroom. Additional guidance then points to possible pupil errors.

You can download and personalise each question document, to support you in meeting the standards in the early career framework (ECF).’

NUMBER

1. How confident are you that you understand and can support children to use and apply the principles of counting?
2. How confident are you that you understand and can support children to use mathematical symbols to show relationships and compare quantities?
3. How confident are you that you understand and can support children to identify small quantities through perceptual or conceptual subitising?
4. How confident are you that you understand and can support children to compose and decompose numbers, using representations to support this?
5. Are you confident that you understand and can support children to unitise?
6. How confident are you that you understand and can support children to recognise the structure of the place value system, linking to concepts including decimals and negative numbers?
7. Are you confident that you understand and can support children to estimate and round using their knowledge of the relative position of numbers?

ADDITIVE REASONING

1. How confident are you that you understand and can support children to use a part–part–whole model, to explain the structures of aggregation (addition) and partitioning (subtraction)?
2. How confident are you that you understand and can support children to use a first, then and now story to explore the structures of augmentation (addition) and reduction (subtraction)?
3. How confident are you that you understand and can support children to use finding the difference as a model for comparison?
4. How confident are you that you understand and can support children to explain commutative and associative laws and the importance they play in additive reasoning?
5. How confident are you that you understand and can support children to use and apply a range of mental strategies to support efficient calculation?
6. How confident are you that you understand and can support children to use manipulatives when developing a written algorithm for addition?
7. How confident are you that you understand and can support children to explore different written algorithms for subtraction?
8. How confident are you that you understand and can support children to select appropriate and efficient strategies, dependent on context?
9. How confident are you that you understand and can support children to calculate with negative numbers?
10. How confident are you that you understand and can support children to develop strategies for solving problems with two unknowns?

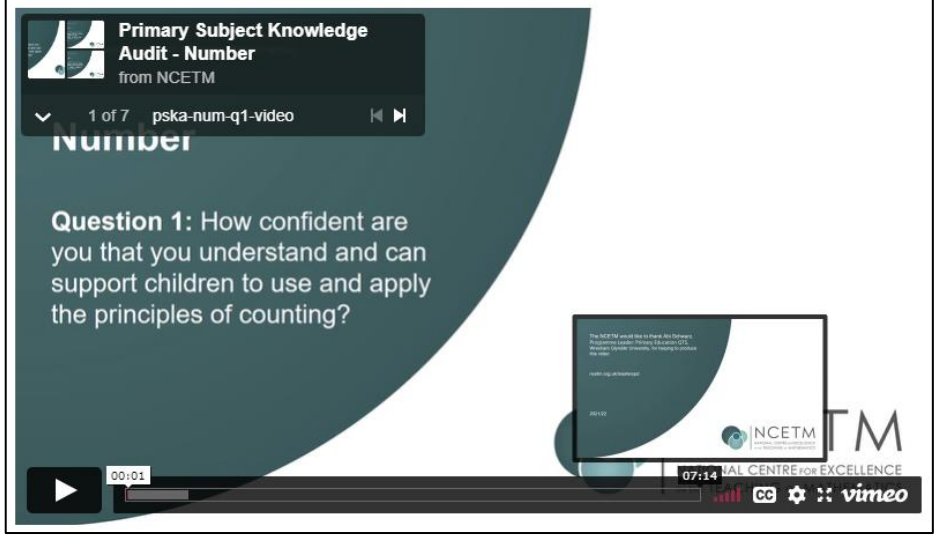
MULTIPLICATIVE REASONING

1. How confident are you that you understand and can support children to recognise the role of unitising in multiplicative reasoning?
2. How confident are you that you understand and can support children to identify the principles of equal grouping and scaling in multiplication?
3. How confident are you that you understand and can support children to identify the principles of equal grouping and scaling in multiplication?
4. How confident are you that you understand and can support children to recognise and use associative and commutative laws in multiplication?
5. How confident are you that you understand and can support children to recognise distributive law in multiplication?
6. How confident are you that you understand and can support children to identify the principles of quotitive and partitive structures in division?
7. How confident are you that you understand and can support children to explore different written algorithms for multiplication?
8. How confident are you that you understand and can support children to explore different algorithms for division?
9. How confident are you that you understand and can support children to select appropriate and efficient strategies, depending on the context?

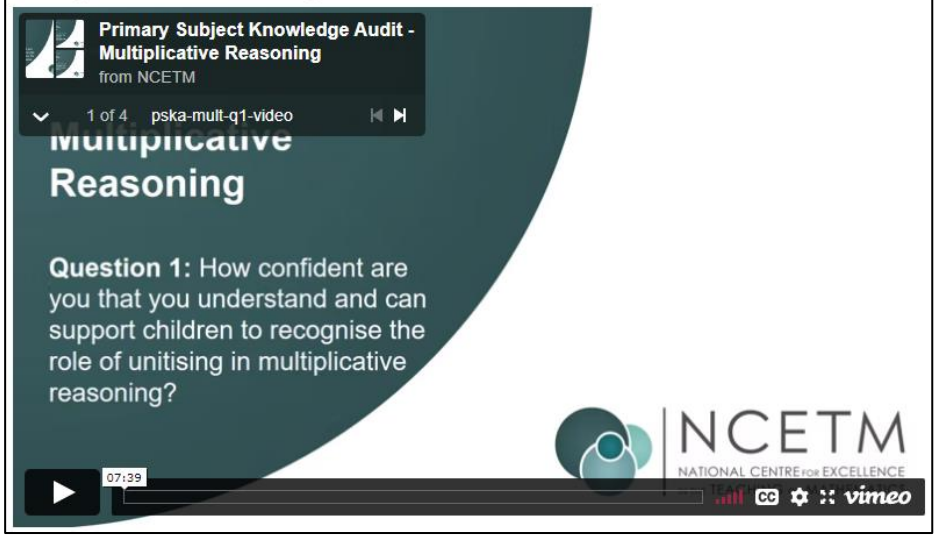
FRACTIONS

1. How confident are you that you understand and can support children to identify a whole and a part in different contexts?
2. How confident are you that you understand and can support children to recognise that a whole can be divided into equal and unequal parts and these parts may not look the same?
3. How confident are you that you understand and can support children to iterate a whole from a given part?
4. How confident are you that you understand and can support children to recognise that a whole can be divided into any number of equal parts and that we use fraction notation to describe this?
5. How confident are you that you understand and can support children to recognise the importance of the denominator in comparing and ordering fractions?
6. How confident are you that you understand and can support children to recognise that non-unit fractions are multiples of unit fractions?
7. How confident are you that you understand and can support children to understand that a fraction can be a number in its own right?
8. How confident are you that you understand and can support children to add and subtract fractions?
9. How confident are you that you understand and can support children to work with fractions that are greater than one whole?
10. How confident are you that you understand and can support children to understand the multiplication of whole numbers and fractions as both repeated addition and scaling?
11. How confident are you that you understand and can support children to recognise that equivalent fractions share the same proportional (multiplicative) relationship between the numerator and denominator?
12. How confident are you that you understand and can support children to convert some fractions into decimals and use these to simplify calculations?

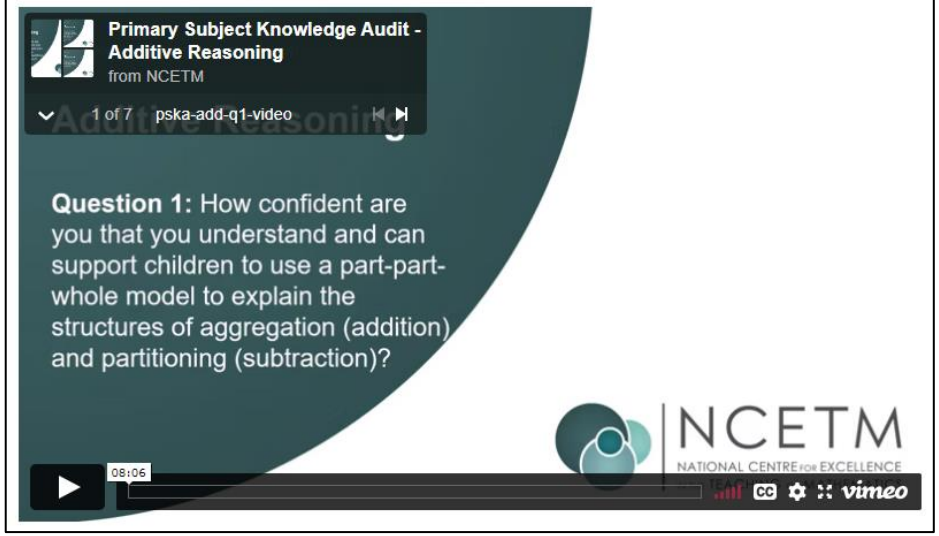
Number videos



Multiplicative reasoning videos



Additive reasoning videos



CURRICULUM AND PEDAGOGY

- Calculation policy: progression; manipulatives/representations; and inclusion of FDP.
- NCETM ‘Curriculum Prioritisation’ materials: case study.
- EEF mathematics guidance: ‘Making the most of worked examples’.

DEVELOPING YOUR USE OF MANIPULATIVES IN MATHS TEACHING

'Articles, books and video to help you use physical representations more effectively in lessons.' [NCETM article, October 2022]

Articles and blogs

- **An introduction to algebra tiles** A mixture of text and short video clips in an article that covers how algebra tiles can be used to support pupils in counting, and in understanding linear equations, factorising and more.
- **Do manipulatives help students learn?** An article by Daniel Willingham on the website of the American Federation of Teachers argues that how a manipulative is used in a classroom is more important that whether it is used.
- **Manipulatives and variation theory** An article published by the British Educational Research Association (BERA) looking at how to teach 'counting on' to young children
- **Concrete resources explained for parents** A blog post aimed at helping parents of primary-age children understand various manipulatives, and how they might use them with children at home.

Video

- **Division of fractions** is an 11-minute video from the author of a book called *Visible Maths*. It suggests how Cuisenaire® rods might be used to support the teaching of division of fractions.

NCETM resources

Last but not least, we need to mention our own resource, **Using mathematical representations in KS3**, written by our Secondary Team in 2019. It includes guidance, video and tips on using nine different representations, including:

- algebra tiles
- place-value counters
- Dienes
- Cuisenaire® rods.

Books

- **Playful Mathematics** A book published earlier this year (March 2022) aimed at those teaching children from 3- to 7-years-old use manipulatives, and other approaches in playful situations, which—bit by bit—help to build understanding.
- **Build it, Say it, Write it** is one of several books on using concrete resources from the Association of Teachers of Mathematics (ATM). It covers learning of perimeter and area. Other books from the ATM address different mathematical topics.
- **Concrete Materials in the Classroom** is one of 37 chapters in a publication from 1996 with authors from around the world.

'There's a growing consensus among maths teachers, and those who guide their development, that physical manipulatives should play a central role in maths teaching. Not just for young pupils, and also not just for those who can't understand something. They can always be of help to build or deepen understanding of a mathematical concept.

https://thirdspacelearning.com/blog/concrete-resources-cpa-explained/

TEACHING FOR MASTERY

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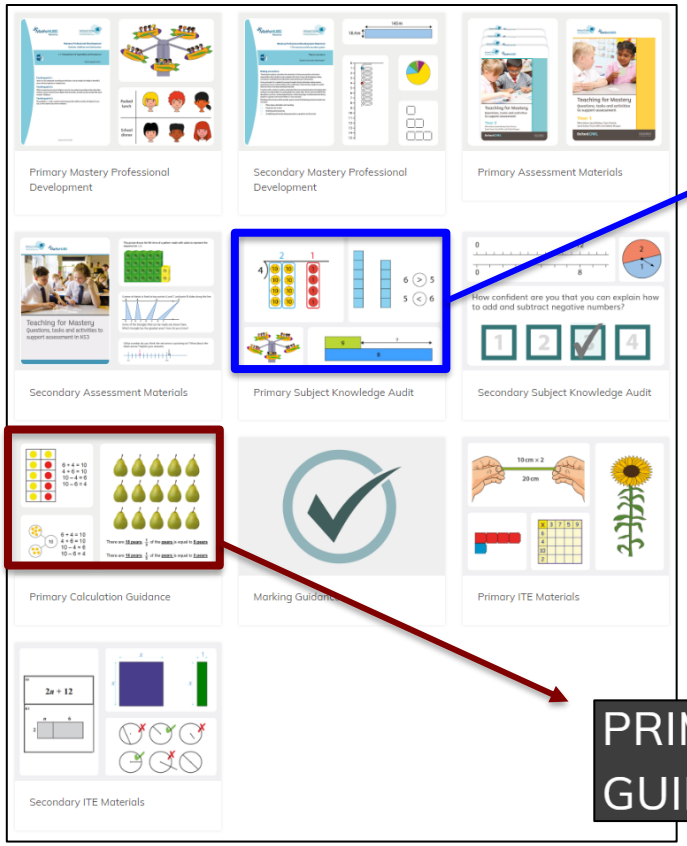

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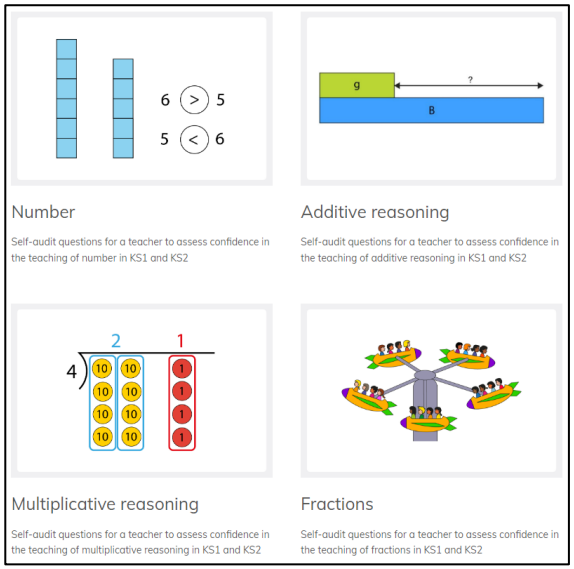
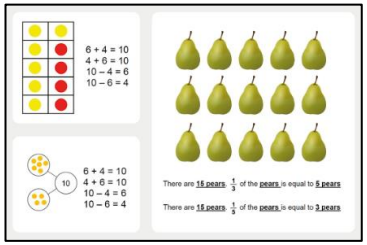


PRIMARY CALCULATION GUIDANCE

PRIMARY CALCULATION GUIDANCE

Recommendations and effective practice teaching ideas



'The following priority areas have been identified. Each of these is discussed in more detail with examples below':

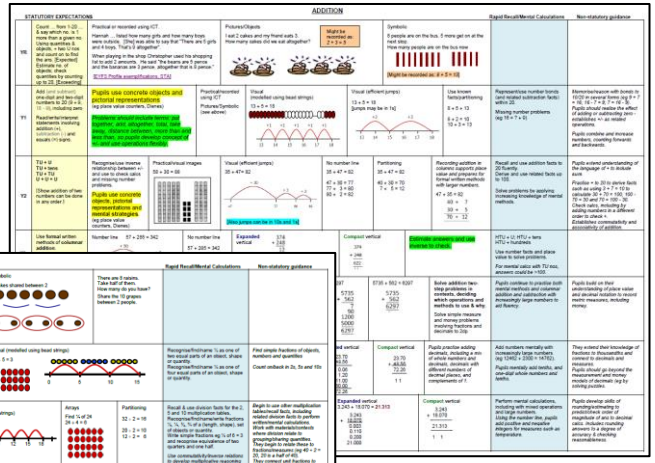
- Develop children's fluency with basic number facts
- Develop children's fluency in mental calculation

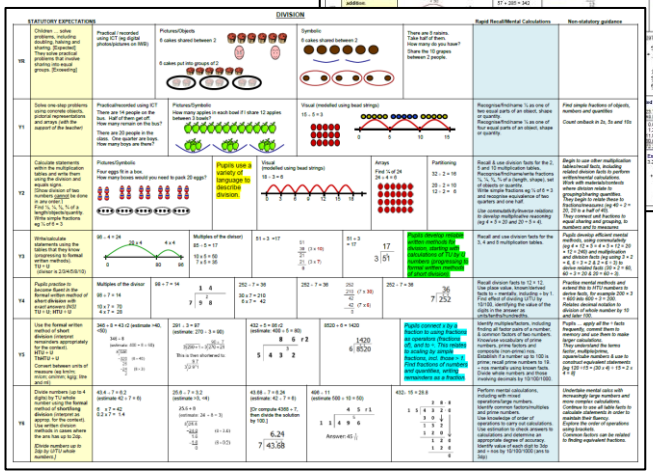
- Develop children's fluency in the use of written methods
- Develop children's understanding of the = symbol
- Teach inequality alongside teaching equality
- Don't count, calculate
- Look for pattern and make connections
- Use intelligent practice
- Use empty box problems
- Expose mathematical structure and work systematically
- Move between the concrete and the abstract
- Contextualise the mathematics
- Use questioning to develop mathematical reasoning
- Expect children to use correct mathematical terminology and speak in full sentences
- Identify difficult points

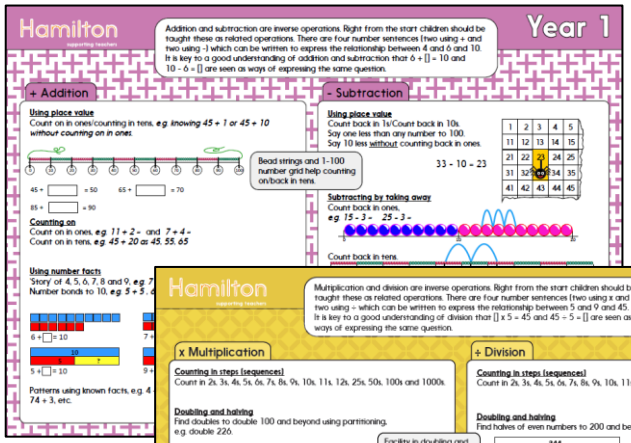
PROGRESSION MAPS FOR KEY STAGES 1 AND 2

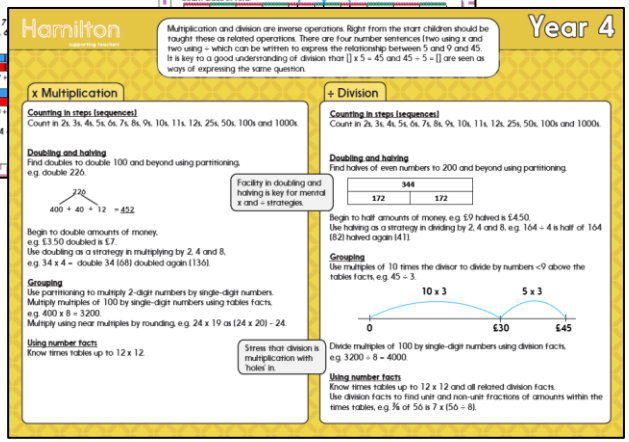
The progression maps are structured using the topic headings as they appear in the National Curriculum

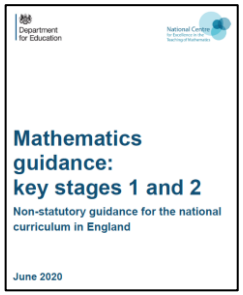
NCETM
NATIONAL CENTRE FOR EXCELLENCE IN THE TEACHING OF MATHEMATICS

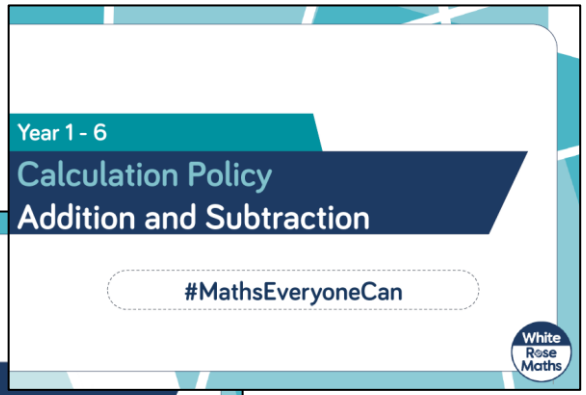


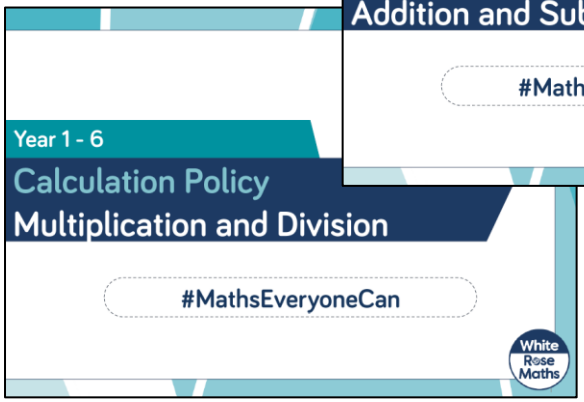












WHY USE THINK, PAIR, SHARE?

The strategy has numerous benefits:

1. Developing a new perspective

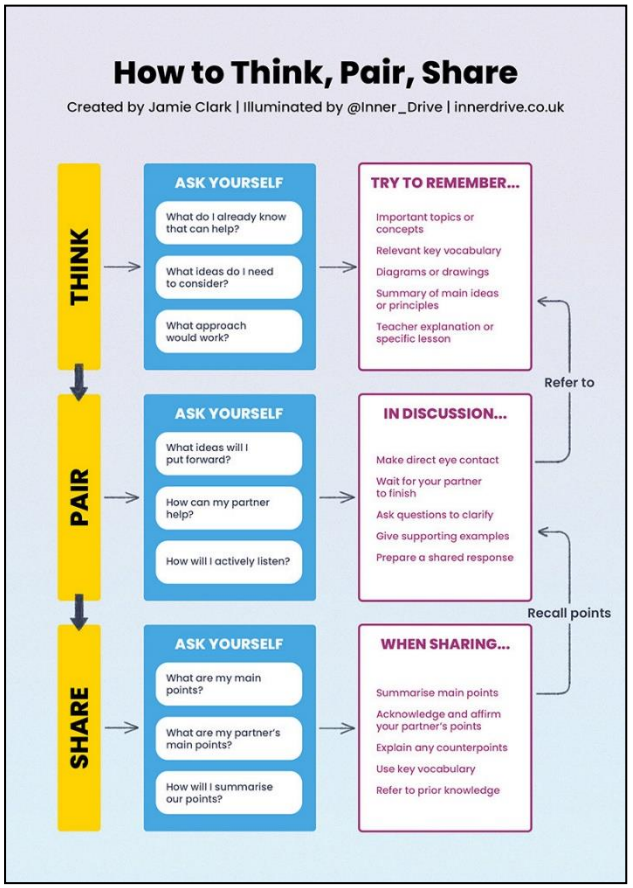
Research suggests if students are working with others, they are more likely to experiment with different techniques when solving a problem. This suggests that the phrase '*two heads are better than one*' certainly has some merit. Students can learn by discussing each other's opinions and reasoning, as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

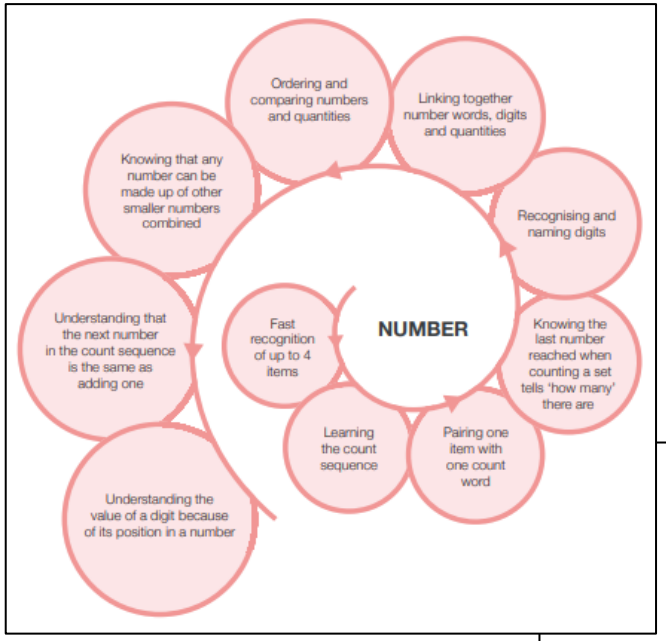
WHAT IS THINK, PAIR, SHARE?

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:

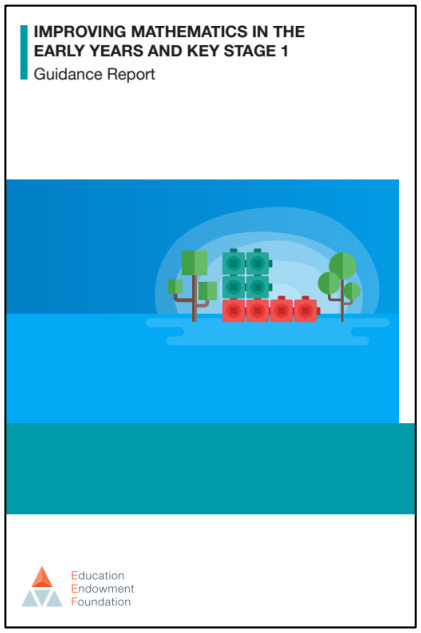
1. ***Think*** – Each student thinks about the question individually and is encouraged to take notes
2. ***Pair*** – Students pair up to exchange and discuss their ideas
3. ***Share*** – Students share their validated and maybe extended ideas with the whole class

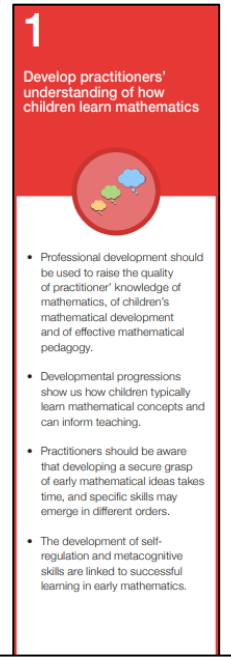
EEF Blog: Developmental Progressions in Early Maths

Developmental Progressions are the typical paths that children follow in developing understanding of a maths topics

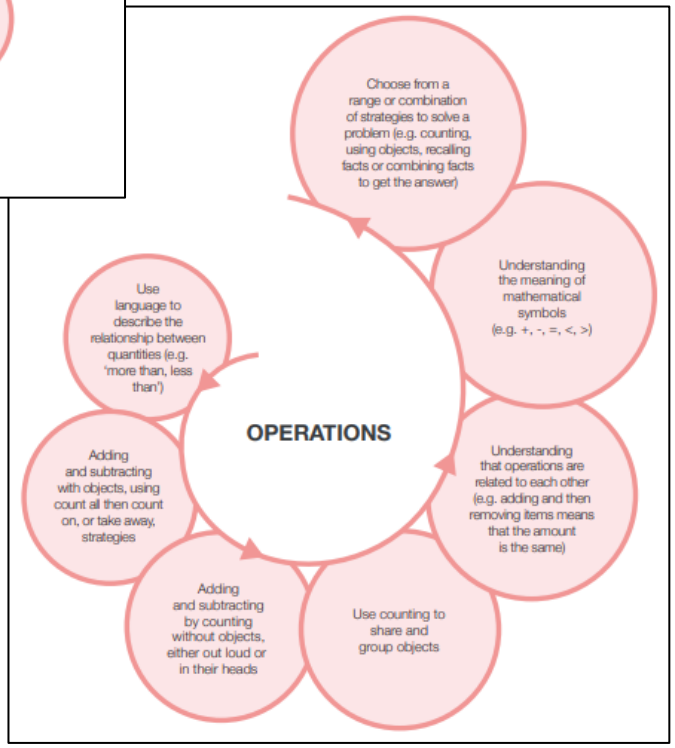


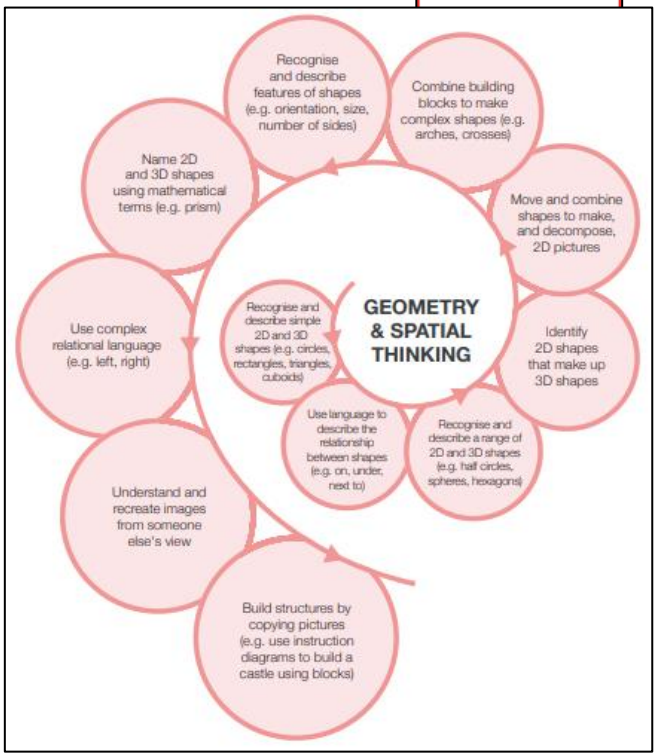
'***Developmental progressions*** describe the typical path that children tend to follow in developing an understanding of a mathematical topic.'





'They are presented in a spiral format to convey that, although there is some ordering in which certain skills or concepts may emerge, development does not take place in clearly defined linear steps.'



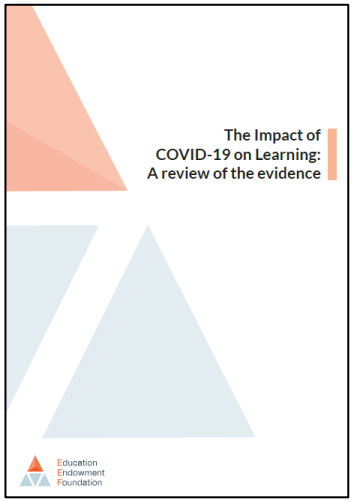


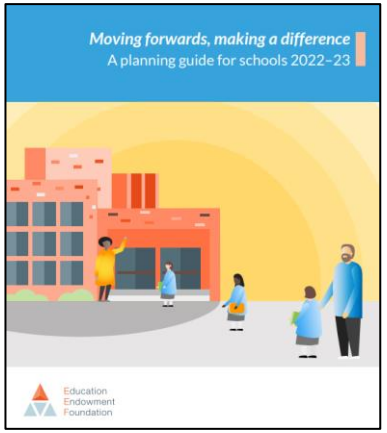
EEF blog: Moving forwards and mobilising metacognition

'As we move into the new academic year, many schools will be contemplating how best to promote pupils' independence and resilience. This has long been the 'million-dollar question' in schools, but perhaps in the year ahead it holds even more importance, as school staff look to move pupils' learning forwards in the wake of COVID.'

'The EEF Moving Forwards, Making a Difference school planning guide is designed to support teachers and school leaders in identifying and addressing key priorities for their settings in the year ahead. Written in response to some of the latest findings around the impacts of the COVID pandemic, it offers practical advice and signposts evidence-informed resources on a variety of areas of teaching practice, from maximising the quality of teaching to removing non-academic barriers to attainment.

*'Education lecturer and former primary teacher **Kirstin Mulholland** explains how metacognition can support pupil learning in the new academic year.'*

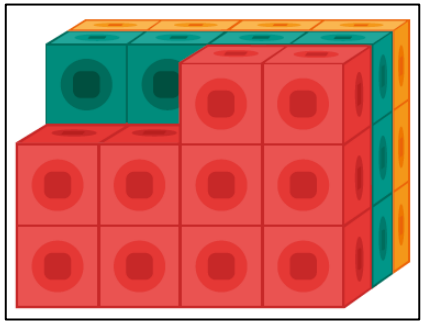




Ways into maths: Making the most of worked examples

‘EEF Content Specialist, Kirstin Mulholland, introduces our new case studies which exemplify how three schools have used worked examples to prompt pupils to evaluate the use of different problem-solving strategies and develop metacognitive thinking.’

WORKED EXAMPLES IN KS2 MATHEMATICS
Mari Palmer, Settrington All Saints’ CoE Primary School



Caroline Sharp, Redriff Primary School

Dad is making sandwiches for a party. There are 3 different types of bread—white, brown and wholemeal—and 5 different fillings—jam, cheese, ham, tuna and peanut butter. Each sandwich has only one type of bread and one filling. How many different sandwiches can he make?

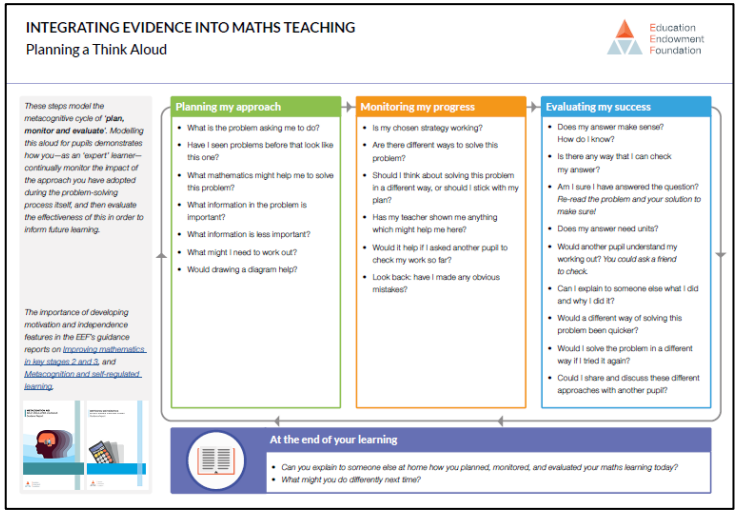
This blog references:

Using worked examples to support mathematical problem solving (EEF, 11.05.22)

*‘**Kirstin Mulholland** explains how to make effective use of worked examples to support pupils’ problem solving.’*

The problem with problem solving in maths (EEF, 14.12.21)

'Maths content specialist, **Kirstin Mulholland**, explores how practitioners can support pupils to problem solve effectively using metacognition.'



Thinking Aloud to support mathematical problem solving (EEF 01.02.22)

'**Kirstin Mulholland** explains how to use *Think Alouds* to scaffold pupils' problem solving in mathematics.'

Using worked examples to support mathematical problem solving (EEF, 11.05.22)

*'**Kirstin Mulholland** explains how to make effective use of worked examples to support pupils' problem solving.'*

EEF blog: Using the debrief to support structured reflection on mathematical problem-solving

HOW DO WE MAKE MATHEMATICS TEACHING EQUITABLE FOR ALL PUPILS?

STEVE LOMAX:
EDUCATION CONSULTANT

Workshop outline:

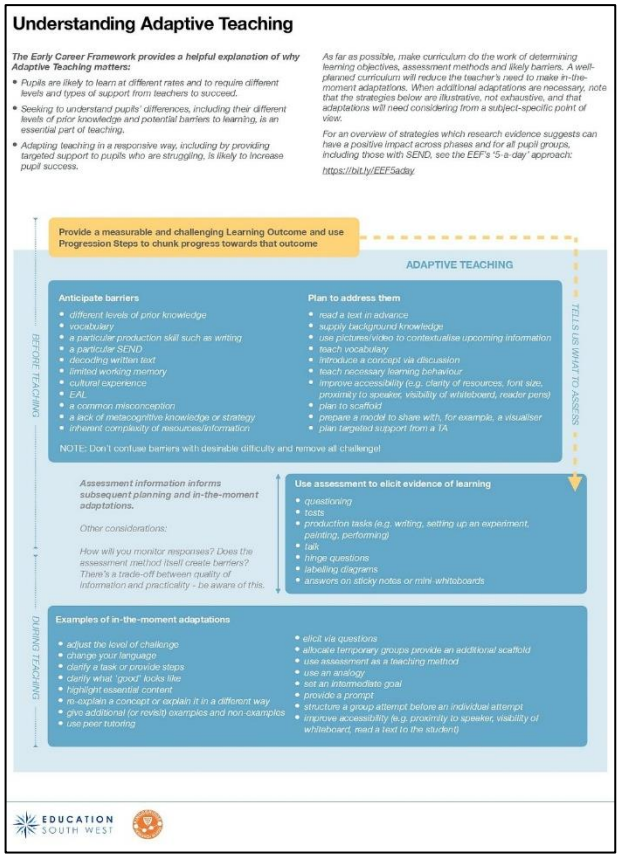
- Explore the proactive curricular, pedagogical and environmental approaches that enable all pupils, in particular pupil premium and SEND, to keep up and reach equal outcomes with their peers.
- Discuss how traditional intervention approaches can result in wide attainment gaps and a tail of under-achievement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

EEF blog: Moving from 'differentiation' to 'adaptive teaching'

'Jon Eaton, Director of Kingsbridge Research School and Research Lead at Kingsbridge Community College, reflects on what adaptive teaching has meant for their Trust, Education Southwest.'

'Over the past few years, *differentiation* has become an increasingly unpopular term in teaching. Most likely, it was an unintended consequence of an accountability system that incentivised teachers to 'prove' they were differentiating by generating multiple worksheets or by organising mini-lessons for different groups.

In a helpful document entitled, 'Differentiation – Why and How?', NASEN capture some of the problems.'



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Differentiation – why and how?

Differentiation has had something of a bad press in recent years, particularly since the introduction of the new National Curriculum, 'mastery teaching' and a move towards more whole class teaching. It has been argued (incorrectly but nevertheless with impact) that the new curriculum means that we should not differentiate at all, and that every pupil should follow the curriculum for their year group regardless of their learning difficulties. It is time to revisit differentiation and clarify what it is, how it fits in with the new curriculum and mastery teaching, and how you can use it effectively.