

Supporting Deep Dives in Mathematics

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Aims of the Session

- To know what the Ofsted framework says about the 3Is
- Being well prepared to sell your subject as the Maths lead
- Know what is happening in classrooms and preparing teachers
- To prepare your pupils to talk about their Maths learning
- To share recent experiences from different sources

The Ofsted Framework

Does your curriculum identify the knowledge pupils need to achieve the goals of their education, and have all pupils learned that knowledge?

Subject leaders do **not** need to prepare special documentation for Ofsted on intent, implementation and impact.

Intent is simply **what** you want pupils to learn: your curriculum thinking and high-level planning.

From the Framework for intent:

- *a curriculum that is ambitious for almost all learners*
- *planned and sequenced towards cumulatively sufficient knowledge*
- *learners study the full curriculum*

The Ofsted Framework

Implementation is the teaching activities you choose to teach your curriculum.

From the Framework for implementation:

- *Teachers have good subject knowledge*
- *Leaders provide effective support*
- *Teachers check learners' understanding systematically, identify misconceptions accurately and provide clear, direct feedback*
- *Adapt teaching as necessary*
- *Teaching is designed to help learners to remember and to integrate new knowledge*
- *Teachers and leaders use assessment well*
- *Resources and materials reflect the ambitious intentions and clearly support the intent of a coherently planned curriculum,*

The Ofsted Framework

Impact is when that curriculum content is learned.

From the Framework for impact:

- *learners develop detailed knowledge and skills across the curriculum*
- *learners are ready for the next stage of education*

Your Role as Subject Leader

- Articulating your school vision/rationale for Mathematics

Why do we teach what we teach in the way that we do?

- Do you follow the Mastery approach – what does this mean/look like?
- Do you use a scheme and how does this link to the National Curriculum?
- How does your curriculum ensure progression throughout the school?
- What is your pedagogy in foundation stage?
- How does the curriculum support disadvantaged pupils?
- Is the curriculum ambitious for all pupils? Challenge for all.

Your Role as Subject Leader

- **Planning**

- How does the long term plan break down across each year group and how do teachers use this to design their lessons? What will be seen in lessons – where does current learning fit in, what new knowledge and skills are evident?
- Questions on specifics – most likely to be around fluency

- **Assessment**

- Examples of end of unit/topic assessments. How are they used?
- End of Term assessments – how are they fed back into teaching and learning?
- Gaps in learning – how are they identified and addressed?
- Use of interventions

Your Role as Subject Leader

- **Monitoring the subject**
 - How do you monitor what is happening in classes – can this be evidenced?
 - What has happened following monitoring? - impact
- **Subject knowledge and CPD**
 - You in your role
 - For all staff, including support staff
 - For new staff and/or ECTs

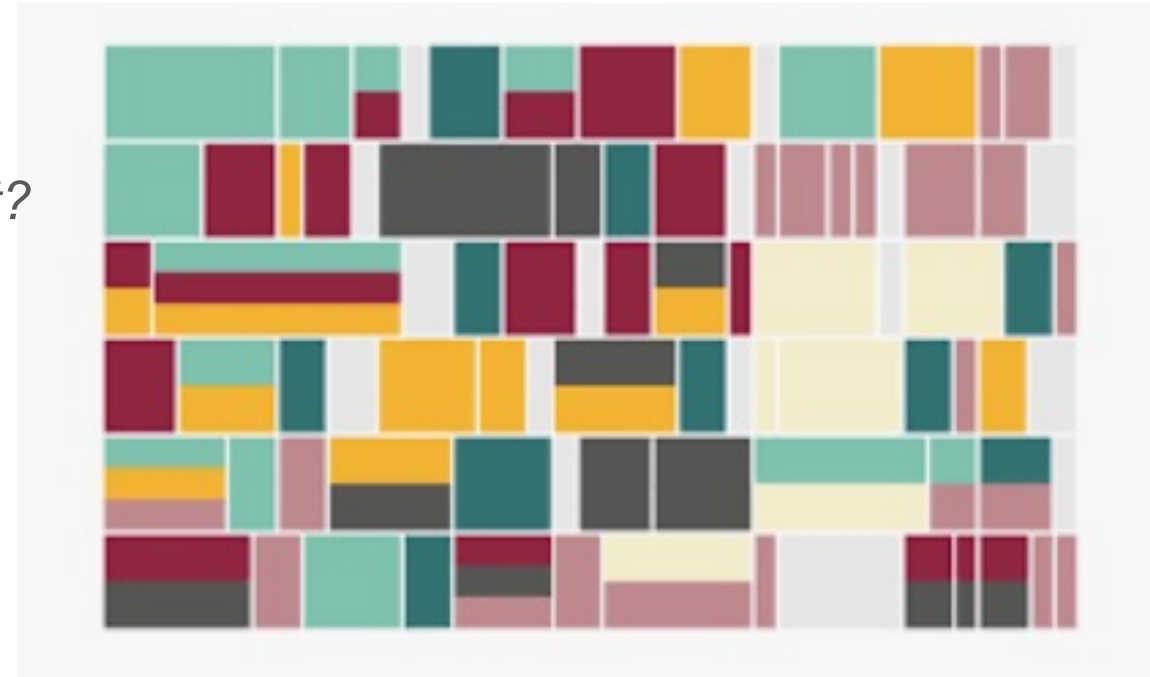
In the Classroom: Progression

Why are you teaching this particular lesson?

Can you tell me what they've already been taught?

After this lesson, what will the children be taught next?

What will pupils learn next year?



Curriculum prioritisation in primary ...

ncetm.org.uk

Strand	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
MD		2MD-1 Recognise repeated addition contexts, representing them with multiplication equations and calculating the product, within the 2, 5 and 10 multiplication tables.	3MD-1 Apply known multiplication and division facts to solve contextual problems with different structures, including quotitive and partitive division.	4MD-1 Multiply and divide whole numbers by 10 and 100 (keeping to whole number quotients); understand this as equivalent to making a number 10 or 100 times the size. →	5MD-1 Multiply and divide numbers by 10 and 100; understand this as equivalent to making a number 10 or 100 times the size, or 1 tenth or 1 hundredth times the size.	For year 6, MD ready-to-progress criteria are combined with AS ready-to-progress criteria (please see above).
		2MD-2 Relate grouping problems where the number of groups is unknown to multiplication equations with a missing factor, and to division equations (quotitive division).		4MD-2 Manipulate multiplication and division equations, and understand and apply the commutative property of multiplication.	5MD-2 Find factors and multiples of positive whole numbers, including common factors and common multiples, and express a given number as a product of 2 or 3 factors.	
				4MD-3 Understand and apply the distributive property of multiplication. →	5MD-3 Multiply any whole number with up to 4 digits by any one-digit number using a formal written method.	
					5MD-4 Divide a number with up to 4 digits by a one-digit number using a formal written method, and interpret remainders appropriately for the context.	

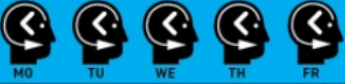


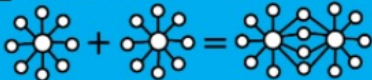






https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1017683/Maths_guidance_KS_1_and_2.pdf

Factual fluency progression

	Year 1	Year 2	Year 3	Year 4	Year 5
Additive factual fluency	Addition and subtraction within 10.	Addition and subtraction across 10.	Secure and maintain fluency in addition and subtraction within and across 10, through continued practice.		
Multiplicative factual fluency			Recall the 10 and 5 multiplication tables, and corresponding division facts.	Recall the 3, 6 and 9 multiplication tables, and corresponding division facts.	Secure and maintain fluency in all multiplication tables, and corresponding division facts, through continued practice.
			Recall the 2, 4 and 8 multiplication tables, and corresponding division facts.	Recall the 7 multiplication table, and corresponding division facts.	
				Recall the 11 and 12 multiplication tables, and corresponding division facts.	

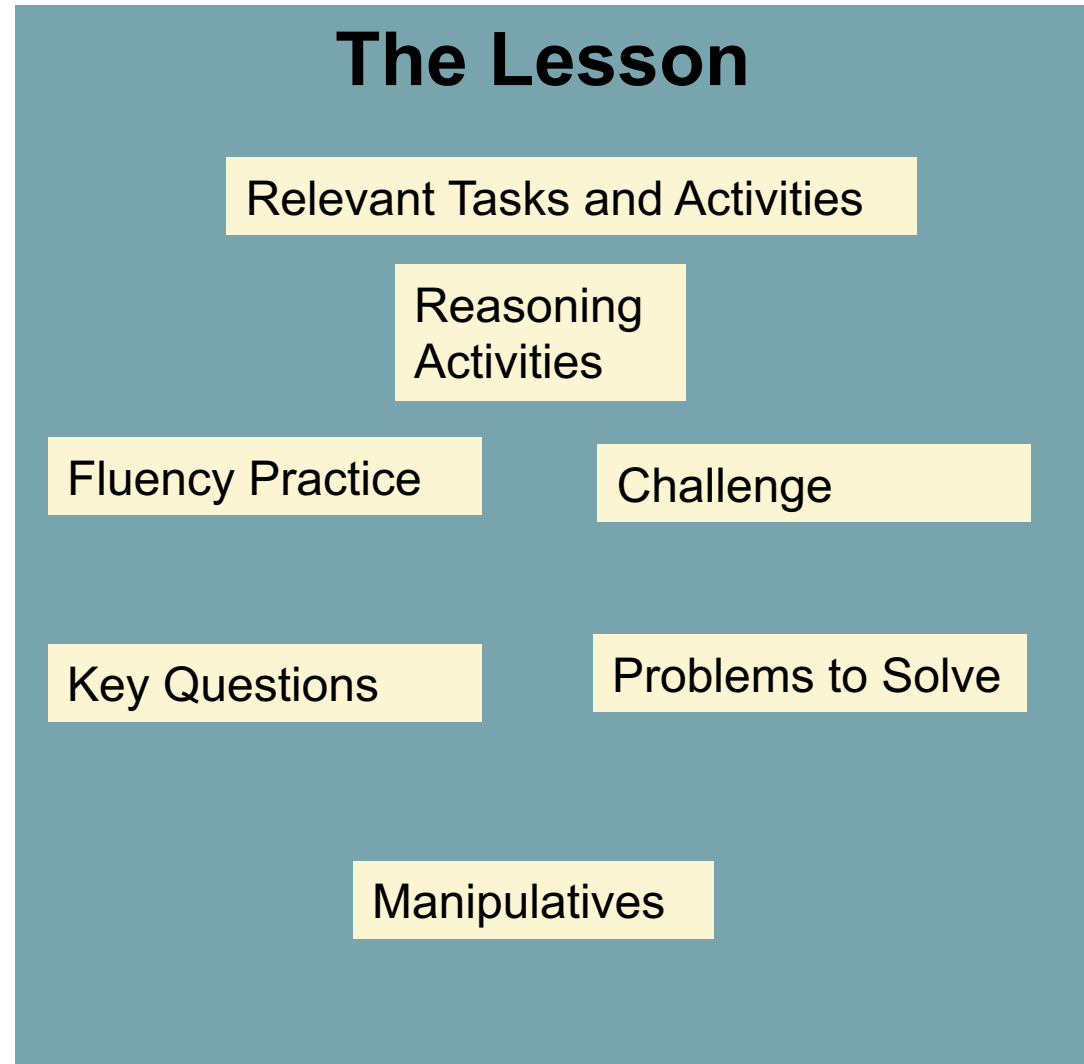
In the Classroom: Design of a lesson

How did you plan the journey of the lesson?

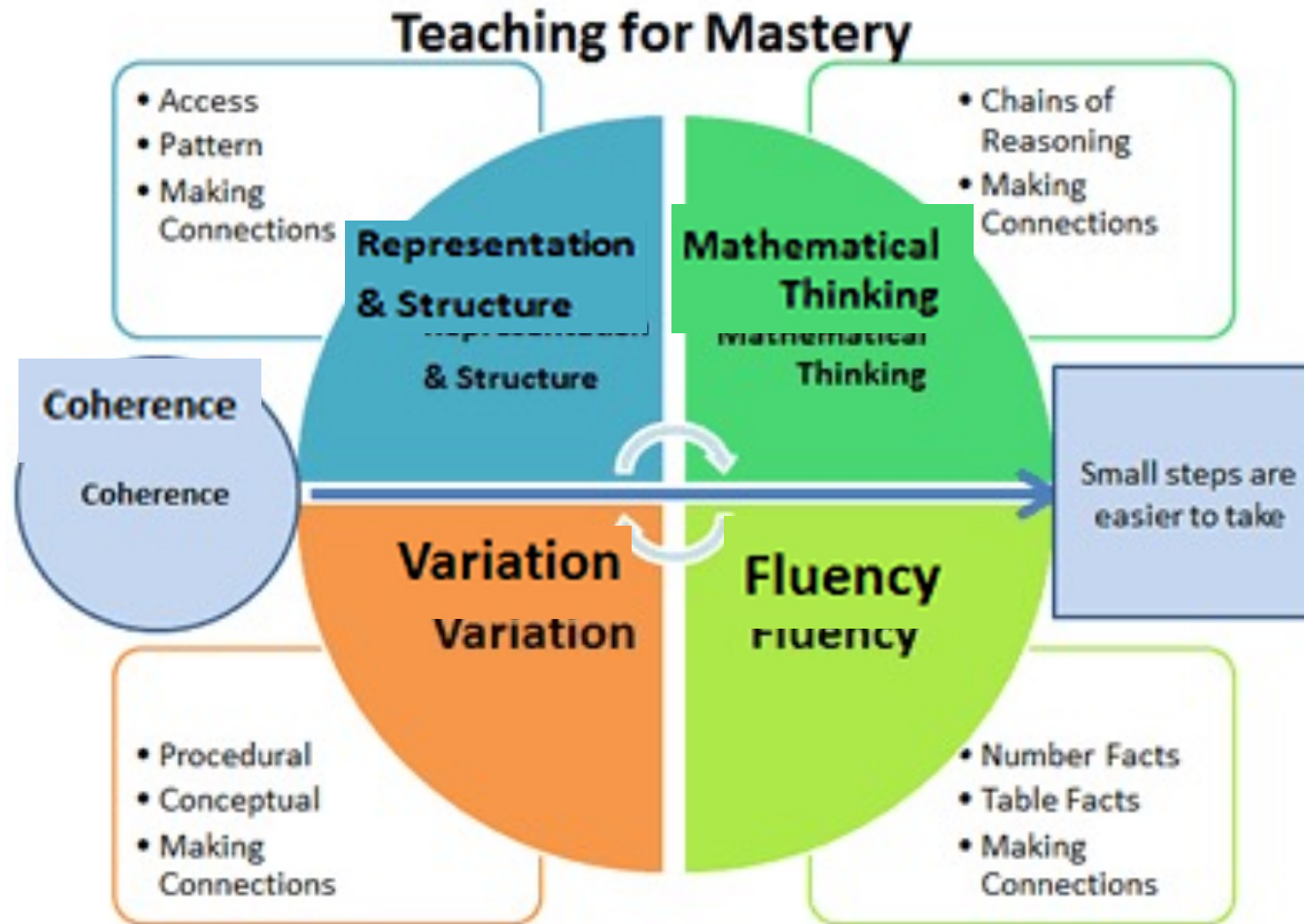
<p>01 DAILY REVIEW</p>  <p>Daily review is an important component of instruction. It helps strengthen the connections of the material learned. Automatic recall frees working memory for problem solving and creativity.</p>	<p>02 NEW MATERIAL IN SMALL STEPS</p>  <p>Our working memory is small, only handling a few bits of information at once. Avoid its overload — present new material in small steps and proceed only when first steps are mastered.</p>
<p>03 ASK QUESTIONS</p>  <p>The most successful teachers spend more than half the class time lecturing, demonstrating and asking questions. Questions allow the teacher to determine how well the material is learned.</p>	<p>04 PROVIDE MODELS</p>  <p>Students need cognitive support to help them learn how to solve problems. Modelling, worked examples and teacher thinking out loud help clarify the specific steps involved.</p>
<p>05 GUIDE STUDENT PRACTICE</p>  <p>Students need additional time to rephrase, elaborate and summarise new material in order to store it in their long-term memory. More successful teachers built in more time for this.</p>	<p>06 CHECK STUDENT UNDERSTANDING</p>  <p>Less successful teachers merely ask "Are there any questions?" No questions are taken to mean no problems. False. By contrast, more successful teachers check on all students.</p>
<p>07 OBTAIN HIGH SUCCESS RATE</p>  <p>A success rate of around 80% has been found to be optimal, showing students are learning and also being challenged. Better teachers taught in small steps followed by practice.</p>	<p>08 SCAFFOLDS FOR DIFFICULT TASKS</p>  <p>Scaffolds are temporary supports to assist learning. They can include modelling, teacher thinking aloud, cue cards and checklists. Scaffolds are part of cognitive apprenticeship.</p>
<p>09 INDEPENDENT PRACTICE</p>  <p>Independent practice produces 'overlearning' — a necessary process for new material to be recalled automatically. This ensures no overloading of students' working memory.</p>	<p>10 WEEKLY & MONTHLY REVIEW</p>  <p>The effort involved in recalling recently-learned material embeds it in long-term memory. And the more this happens, the easier it is to connect new material to such prior knowledge.</p>

*Let's warm up your brain
Let's learn something new
Let's talk
Let's develop our learning
Let's work independently
Let's review*

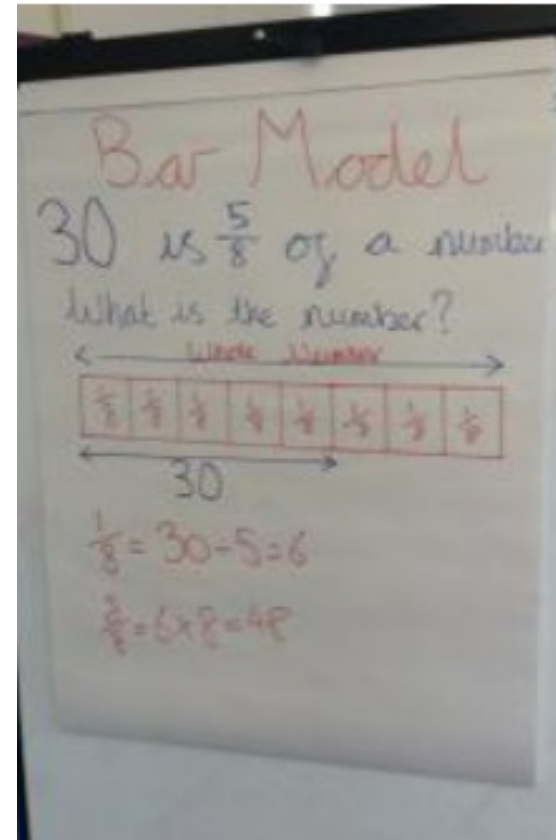
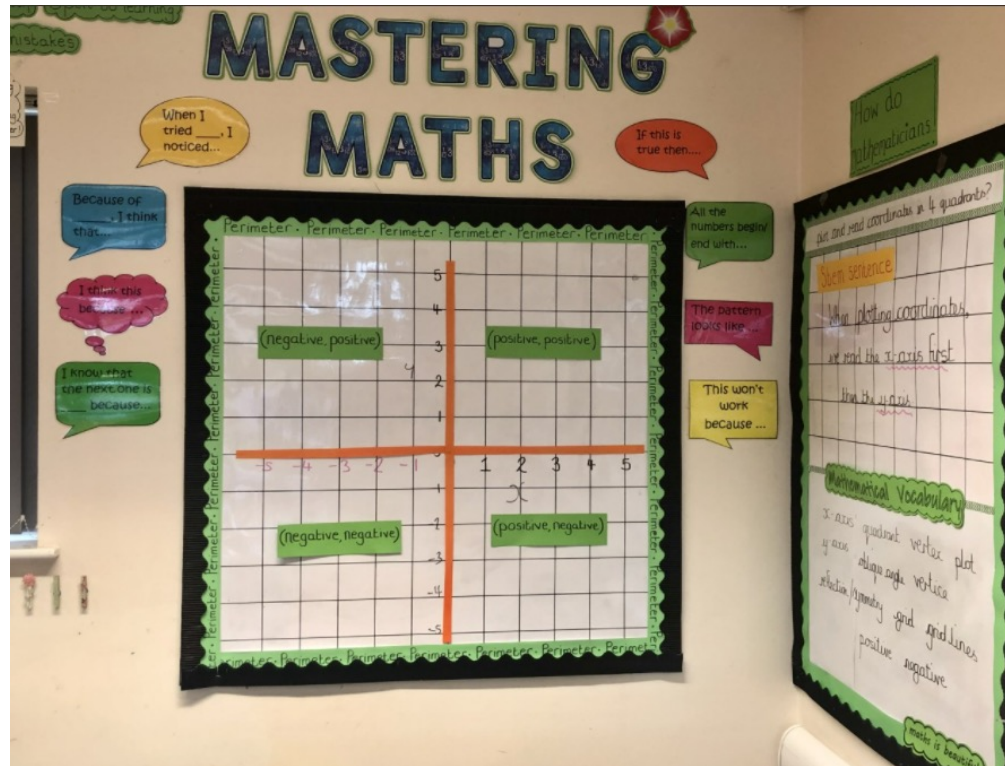
In the Classroom: Features of a lesson



In the Classroom: The 5 Big Ideas



In the Classroom: Classroom Environment



In the Classroom: Feedback

Is feedback only seen in pupil's books?

Principles of Marking (taken from "Eliminating Unnecessary Workload Around Marking" Independent Teacher Workload Review):

- Marking varies by age group, subject, and what works best for the pupil and teacher in relation to any particular piece of work. Teachers are **encouraged to adjust** their approach as necessary and trusted to incorporate **outcomes** into subsequent planning and teaching.
- Marking practice is **proportionate** and considers the frequency and complexity of written feedback, as well as the cost and time effectiveness of marking in relation to **overall workload of teachers**.
- Marking should help to motivate pupils to progress. This does not mean always writing in depth comments or being universally positive: sometimes short, challenging comments or oral feedback are more effective. If the teacher is doing more work than their pupils, this can become a disincentive for pupils to accept challenges and take responsibility for improving their work.

In the Classroom: Assessment and Feedback

How do you assess learning and provide/use feedback?

- AFL within the lesson- small steps will support this (ping pong)
- Scanning the class and providing individualised feedback
- Use of the TA to record observations
- Self-marking
- Whole Class Feedback
- Altering your lessons to address common misconceptions.
- Retrieval as part of the lesson but at other times too – low stakes quizzes
- Formative Assessment e.g. Ready to Progress Assessments, end of unit assessments. SATS.

In the Classroom: Keep everyone on track

How do you ensure that everyone is on track?

- Design of the lessons allows for continual assessment.
- Gradual removal of scaffolding allows for misconceptions are addressed
- Differentiation – what it is and what it isn't.
- Structured interventions
- Rapid intervention
- Pre teaching

In the Classroom: How are you supported?

Implementation

Teachers have good knowledge of the subject(s) and courses they teach. Leaders provide effective support, including for those teaching outside their main areas of expertise.

- What opportunities have there been outside of school? (Network meetings, working with the Maths Hub, ECT modules.)
- What PD opportunities have there been in school? – TRGs, Lesson Study, Collaborative Planning

Pupils: Interviews

What might OFSTED ask pupils?

- Do you enjoy Maths?
- Can you choose some work in your book and tell me about it?
- What do you do if you find something tricky?

Pupils: Books

What evidence can you collect as Maths Lead before OfSTED make the call?

- Look at the books (consistency in representation on language/ progression from EYFS to Year 6 etc)
- Know which books you will pick to share if you have the choice- pick a range.






Pupils: Observations

DESIRED IMPACT - Pupils are positive about maths, have good learning behaviours and are making at least expected Progress. How will you know? What can you do?

Observations

In a lesson this might focus on three levels:

- pupil engagement during the lesson
- pupil experiences and beliefs
- pupil learning outcomes

Range of 'smiley faces' e.g.					
How do you feel when it is time for maths?					
When we talk about something which seems difficult in maths, do you think you will understand it at the end of the lesson to understand it?					
Do we spend enough time on a maths topic?					
Do you remember what we did in our last maths lessons to help you with the next lesson?					
Do you like finding more than one way of answering a question?					
Do you like learning from using resources in maths?					
Do you like learning from using pictures in maths?					
Do you find it helpful to say how you found your answer to a question?					
Do you find it helpful to hear how others found the answer to a question?					
Do you like it when everyone works on the same questions in the lesson?					
Do you find it useful when we repeat sentences in maths?					
Do you find it easy to remember number facts?					

Pupils: Be ahead of the game!

Other ideas

- Case study of a pupil who made accelerated progress. Use their book as evidence.
- Evidence of a book that shows different aspects of progress e.g. a child that communicates their thinking with words and representations / is a reflective learner/ has made improvements with fluency etc.

Top Tips

- Be secure on your rationale for everything – know WHY you have done what you have and the impact of it. Believe in your choices
- Have a well organised file with evidence of everything that you might want to talk about to exemplify what you're saying
- Have a range of books prepared that you can show (a broad selection)
- Know any gaps and how you are addressing them as well as any areas that you are currently trying to improve – be honest
- Ensure everyone is giving the same message