

‘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) <i>‘Inspectors will consider what steps the school has taken to ensure that:’</i>	PROMPTS/QUESTIONS FOR REFLECTION AND SELF-EVALUATION*	NEXT STEPS
Teaching that builds on pupils’ prior learning	<i>‘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.’</i>	<ul style="list-style-type: none"> ▪ A high priority is given to all pupils developing secure and deep understanding of each key learning point. 	
Curriculum progression and ‘connectedness’ of learning	<i>‘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.’</i>	<ul style="list-style-type: none"> ▪ 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	<i>‘The curriculum divides new material into manageable steps lesson by lesson.’</i>	<ul style="list-style-type: none"> ▪ 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	<i>‘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</i>	<ul style="list-style-type: none"> ▪ Teachers design: lessons that incorporate variation (ie <i>What it is</i> and <i>What it’s not</i>); and tasks that enable pupils to solve problems (routine/non-routine), applying to different contexts. 	

	<i>understanding of, and unconscious competence in, pre-requisite mathematical knowledge, concepts and procedures that are necessary to succeed in the specific tasks set.'</i>	<ul style="list-style-type: none"> ▪ Pupils suggest their own examples (and non-examples) of a concept, idea or technique. 	
Mathematical fluency	<i>'Within the curriculum, there are sufficient opportunities planned to revisit previously learned knowledge, concepts and procedures; this is to ensure that, once learned, mathematical knowledge becomes deeply embedded in pupils' memories. This then allows rapid and accurate recall and frees pupils' attention so they can work with increasing independence, apply their mathematical knowledge to more complex concepts and procedures, and gain enjoyment through a growing self-confidence in their ability.'</i>	<ul style="list-style-type: none"> ▪ Fluency comes from deep knowledge and regular practice (ie <i>'practice makes skilled'</i>). ▪ The principles of a 'growth mindset' support pupils' confidence of themselves as mathematicians. 	
Flexibility to meets the needs of all pupils	<i>'There is flexibility in curriculum planning so that the school can address identified gaps in pupils' mathematical knowledge that hinder their capacity to learn and apply new content. Those pupils behind age-related expectations are provided with the opportunities to learn the mathematical knowledge and skills necessary to catch up with their peers.'</i>	<ul style="list-style-type: none"> ▪ How is learning supported? ▪ How is learning challenged? 	
Assessment of pupils' fluency	<i>'There are objective assessments that can identify when all pupils have gained the intended understanding and unconscious competence in knowledge, concepts and procedures necessary before they move on to new or more complex content.'</i>	<ul style="list-style-type: none"> ▪ Precise questioning ensures pupils develop fluent technical proficiency and think deeply about underpinning mathematical concepts. ▪ Assessment values knowing 'why' as well as knowing 'that' and 'how'. 	
Representation and structure of mathematics	<i>'Teaching models new procedures and uses resources and approaches that enable pupils to understand the mathematics they are learning.'</i>	<ul style="list-style-type: none"> ▪ To what extent do teachers have access to 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	<i>'All teachers of mathematics, including non-specialist teachers of mathematics, have sufficient mathematical and teaching content knowledge to deliver topics effectively.'</i>	<ul style="list-style-type: none"> ▪ The curriculum leader facilitates a planned, bespoke programme of CPD for all practitioners. 	
Numeracy in other curriculum subjects	<i>'Pupils' mathematical knowledge is developed and used, where appropriate, across the curriculum.'</i>	<ul style="list-style-type: none"> ▪ 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. 	

*Informed by **NCETM** [Five Big Ideas in Teaching for Mastery](#) and **GLOWMaths** [What is Teaching for Mastery?](#)