Foundational Knowledge

Supporting schools to strengthen pupils' foundational mathematical knowledge, reducing barriers to future learning

What is foundational knowledge?

Foundational knowledge in mathematics comprises the most important knowledge, concepts and relationships that pupils must secure at the appropriate point in their learning, as future learning depends on this. When secure, it enables pupils to access new ideas; when insecure, it can become a barrier to progress.

Why is foundational knowledge important in mathematics?

Mathematics is a cumulative subject: new learning builds upon what pupils already know and understand.

When foundational knowledge is secure, pupils can devote their attention to:

- recognising mathematical structure
- making connections between ideas
- reasoning mathematically
- learning new mathematics.

When foundational knowledge is insecure, pupils may need to reconstruct basic knowledge while learning something new. This places greater demands on working memory, making it more difficult to do all of the above so that they can connect new learning with existing knowledge.

Securing foundational knowledge therefore supports progression through the curriculum and can improve equitable access to mathematics for all pupils.

Foundational knowledge in the current educational landscape

The importance of foundational knowledge is increasingly reflected across national guidance. Recent publications from both Ofsted and the DfE emphasise the importance of identifying, teaching and assessing pupils' foundational knowledge.
For example:

- the CAR report Building a world-class curriculum for all (2025) states that evidence supports the need to build secure foundations and mastery of key subject concepts to raise standards and enable the development of expertise.
- Ofsted's State-funded school inspection toolkit (2025) highlights the importance of identifying and prioritising the foundational knowledge pupils need for later learning, ensuring they have sufficient foundational knowledge to access learning, and accurately identifying and addressing gaps.
- the DfE's policy paper Every child achieving and thriving (2026) describes reading, writing, speaking and numeracy as the critical foundations that enable pupils to access the wider curriculum.

Together, these publications reinforce the importance of ensuring that the mathematical knowledge on which future learning depends is identified, taught and secured.

How can schools identify foundational knowledge?

A useful starting point is to ask:
What knowledge, concepts and relationships must pupils already have secured to access new learning successfully?
Answering this question shifts the focus from what is being taught today, to what pupils need to bring to the lesson.

The DfE Mathematics Guidance KS1 and KS2 (2020) ready-to-progress criteria provide valuable support for this process because they identify the mathematical knowledge that is most important for progression through the curriculum. Examples include:

- **1AS–1 Compose and partition numbers to 10** lays the foundations for understanding the commutative property of addition.
- **3F–1 Use and understand fraction notation** establishes the understanding of unit fractions that underpins later work on fractions.
- **5NPV–5 Convert between units of measure** identifies key unit conversions that pupils should know before applying them in more complex contexts.

How can schools ensure coherent progression?

Building foundational mathematical knowledge in a coherent manner is crucial for successful learning. The DfE Mathematics Guidance KS1 and KS2 (2020) clearly exemplifies prerequisite knowledge and why learning is important in terms of its future applications as illustrated below:

Year 1 conceptual prerequesites	Year 2 ready-to-progress criteria	Future applications
Know that 10 ones are equivalent to 1 ten. Know that multiples of 10 are made up from a number of tens, for example, 50 is 5 tens.	**2NPV–1** Recognise the place value of each digit in two-digit numbers, and compose and decompose two-digit numbers using standard and non-standard partitioning.	Compare and order numbers. Add and subtract using mental and formal written methods.
Place the numbers 1 to 9 on a marked, but unlabelled, 0 to 10 number line. Estimate the position of the numbers 1 to 9 on an unmarked 0 to 10 number line. Count forwards and backwards to and from 100.	**2NPV–2** Reason about the location of any two-digit number in the linear number system, including identifying the previous and next multiple of 10.	Compare and order numbers. Round whole numbers. Subtract ones from a multiple of 10, for example: $30 - 3 = 27$

How can schools assess foundational knowledge?

Assessment questions are available for each of the ready-to-progress criteria both within the DfE Mathematics Guidance KS1 and KS2 (2020) at the end of each RTP section, and on the NCETM website

under the curriculum map for each Year Group. At the start of a topic, the assessment questions from the previous year group are the most appropriate to ensure that prerequisite knowledge is secure, before moving on to new learning. Where needed, the teacher provides additional teaching and opportunities for practice before introducing the new learning.

As pupils revisit and retrieve knowledge over time, it becomes more secure and more readily available to support future learning.

Where can schools get support for teaching foundational knowledge that is insecure?

There are PowerPoints available from the NCETM for each of the ready-to-progress criteria, and these can be used in whole-class teaching, or by a teaching assistant with small groups or individual pupils. (maybe place an image)

Where next?

Supporting pupils to secure foundational knowledge is most effective when it is embedded within curriculum planning, teaching and assessment, rather than viewed as a separate intervention. School leaders and teachers should work collaboratively to:

- use the ready-to-progress guidance, to identify the mathematical knowledge on which future learning depends
- use assessment to identify whether previously taught foundational knowledge is secure
- where gaps in learning are identified use the Primary Guidance and the exemplification guides to support teaching
- respond through carefully planned teaching, retrieval and practice where needed
- revisit important knowledge over time so that it becomes increasingly accurate, automatic and available for future learning.

By taking this approach, assessment becomes more than a way of identifying gaps. It becomes a means of understanding the knowledge pupils have secured and informing the next steps in teaching.

Working with a Maths Hub can support this through collaborative professional development, helping teachers and leaders to strengthen subject and pedagogical knowledge and refine approaches to identifying and securing foundational knowledge.

When foundational knowledge is explicitly identified, taught and strengthened, more pupils can access new learning, make connections across the curriculum and progress successfully in mathematics.