

Mathematics Guidance: Key Stages 1 and 2

Non-statutory Guidance for the National Curriculum in England

In the summer term, the Department for Education in partnership with the National Centre for Excellence in the Teaching of Mathematics (NCETM) produced a suite of documents to help teachers and schools make effective use of the National Curriculum to develop primary school pupils' mastery of mathematics.

These new documents aim to:

- bring greater coherence to the national curriculum by exposing core concepts in the national curriculum and demonstrating progression from year 1 to year 6
- summarise the most important knowledge and understanding within each year group and important connections between these mathematical topics.

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The most important conceptual knowledge and understanding identified are referred to as ready-to-progress criteria. Whilst these have been identified, it is still a statutory requirement that the **whole of the curriculum** is taught. The criteria provide a framework to demonstrate progression from year 1 to year 6 in key areas. By meeting the ready-to-progress criteria, pupils will be able to more easily access many of the elements of the curriculum that are not covered in the guidance.

Ready-to-progress Criteria

Strand	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
NPV	1NPV-1 Count within 100, forwards and backwards, starting with any number.		3NPV-1 Know that 10 tens are equivalent to 1 hundred, and that 100 is 10 times the size of 10; apply this to identify and work out how many 10s there are in other three-digit multiples of 10.	4NPV-1 Know that 10 hundreds are equivalent to 1 thousand, and that 1,000 is 10 times the size of 100; apply this to identify and work out how many 100s there are in other four-digit multiples of 100.	5NPV-1 Know that 10 tenths are equivalent to 1 one, and that 1 is 10 times the size of 0.1. Know that 100 hundredths are equivalent to 1 one, and that 1 is 100 times the size of 0.01. Know that 10 hundredths are equivalent to 1 tenth, and that 0.1 is 10 times the size of 0.01.	6NPV-1 Understand the relationship between powers of 10 from 1 hundredth to 10 million, and use this to make a given number 10, 100, 1,000, 1 tenth, 1 hundredth or 1 thousandth times the size (multiply and divide by 10, 100 and 1,000).
		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.	3NPV-2 Recognise the place value of each digit in three-digit numbers, and compose and decompose three-digit numbers using standard and non-standard partitioning.	4NPV-2 Recognise the place value of each digit in four-digit numbers, and compose and decompose four-digit numbers using standard and non-standard partitioning.	5NPV-2 Recognise the place value of each digit in numbers with up to 2 decimal places, and compose and decompose numbers with up to 2 decimal places using standard and non-standard partitioning.	6NPV-2 Recognise the place value of each digit in numbers up to 10 million, including decimal fractions, and compose and decompose numbers up to 10 million using standard and non-standard partitioning.
	1NPV-2 Reason about the location of numbers to 20 within the linear number system, including comparing using < > and =	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.	3NPV-3 Reason about the location of any three-digit number in the linear number system, including identifying the previous and next multiple of 100 and 10.	4NPV-3 Reason about the location of any four-digit number in the linear number system, including identifying the previous and next multiple of 1,000 and 100, and rounding to the nearest of each.	5NPV-3 Reason about the location of any number with up to 2 decimal places in the linear number system, including identifying the previous and next multiple of 1 and 0.1 and rounding to the nearest of each.	6NPV-3 Reason about the location of any number up to 10 million, including decimal fractions, in the linear number system, and round numbers, as appropriate, including in contexts.

These tables show the progression in conceptual knowledge and understanding of particular strands from year 1 to year 6. The majority of the criteria fit with the National Curriculum year group expectations, however some do not. These are outlined in the **Additional Questions and Considerations Section** [here](#).

Year Group Chapters

Each year group chapter contains teaching guidance and example assessment questions for each of the ready-to-progress criteria.

Teaching guidance includes:

- Representations of the mathematics to expose important mathematical structures, support children in accessing and understanding the learning and help to make links between prior and new learning.
- Language structures that provide suggested sentence structures that capture, connect and apply important mathematical ideas.
- Making connections that help teachers and pupils to understand and apply the links between different areas of learning.
- Example assessment questions that demonstrate the depth and breadth of understanding that pupils need to progress to the next year group.
- Calculation and fluency development that refers to efficient calculations methods, both mental and written and the number facts that children should be able to recall.

How to Use the Publication

Long Term Planning

DfE/NCETM Guidance

The DfE guidance is that these documents are designed to:

- ensure consistency in the representations and language structures used for these core elements across the whole primary phase
- ensure consistency in the development of calculation methods and number facts that children need to be able to recall
- support curriculum mapping and ensure these core elements are learned at the correct time.

Additional Lancashire Mathematics Team Guidance

Whilst we agree that consistency in representations and language structures is hugely important, significant gaps in the areas covered across the primary phase means that additional work would be required if these were to be used in school for that purpose. For example, work on fractions only begins in Year 3, and there is no addition and subtraction in Years 4 or 5. The latter point will also impact on progression in calculation methods and we would advise schools to follow their own comprehensive mental and written calculation policies. Exemplar policies can be found here:

Written calculations:

http://www.lancsngfl.ac.uk/curriculum/primarymaths/index.php?category_id=1094

Mental calculations:

http://www.lancsngfl.ac.uk/curriculum/primarymaths/index.php?category_id=1158

The minimal number of objectives covered, the gaps across the primary phase and the lack of parity with some year group expectations mean that for curriculum mapping, schools should refer back to the National Curriculum, supported by Key Learning and LAPS which can be found on our website here:

http://www.lancsngfl.ac.uk/curriculum/primarymaths/index.php?category_id=1060

Medium Term Planning

DfE/NCETM Guidance

The DfE guidance is that these documents are designed to:

- support decisions around how much time to set aside for teaching the different areas of the curriculum
- support decisions around when particular elements should be taught in order to maximise the connections between different areas.

Additional Lancashire Mathematics Team Guidance

Schools may find that reading through the teaching guidance sections could assist in identifying the time required for each strand. There are no suggestions within the documentation as to how the curriculum should be mapped, so schools should make decisions based upon the needs of their children. Research from Ofsted suggests that there is a growing body of evidence that interleaving (teaching a curriculum that revisits strands each term) improves retention. This should be taken into account when making decisions about what to teach when.

Short Term Planning

DFE/NCETM Guidance

The DfE guidance is that these documents are designed to:

- support delivery of effective lessons with the focus on mathematical representations, language structures, the relevant connections to other areas and the expectations set out in the example assessment questions.
- support assessment of children's learning and inform decisions about when to move on (formative assessment) as well as summative assessment to check whether the learning has been sustained.

Additional Lancashire Mathematics Team Guidance

The teaching guidance for each objective is useful. The representations and structures exemplify good practice in developing children's conceptual understanding. The documents make effective suggestions for linking learning to other relevant objectives to further enhance learning through application. Schools should bear in mind that these documents represent only a part of the National Curriculum, and as such, cannot be the sole source of short term planning. The example assessment questions for each objective provide a resource to support understanding across a varied range of contexts.

Useful Links

Ready to progress criteria documents:

<https://www.gov.uk/government/publications/teaching-mathematics-in-primary-schools>

Ready to progress criteria exemplifications (PowerPoint presentations for teaching):

<https://www.ncetm.org.uk/classroom-resources/exemplification-of-ready-to-progress-criteria/>

Overview of guidance for each year group:

<https://www.youtube.com/playlist?list=PL6gGtLyXoeq-FMWk00AlclPo3fhGmi03D>

Additional Questions and Considerations for Users

Should this document be used for COVID-19 catch up?

No. Whilst this suite of documents is entitled 'Ready to Progress', it does not fulfil the requirements of the National Curriculum. In addition to this, the more time spent during the autumn term on addressing the gaps caused by closure of schools, the longer children will remain behind year group expectations. Schools should aim to follow their normal curriculum structure as much as possible, with some consideration given to address gaps in necessary prior learning.

Should this document be used for intervention?

Whilst the teaching guidance may be useful support for those providing intervention, they do not constitute an intervention programme. When providing intervention, care should be taken to ensure that content matches children's diagnosed needs.

Notes regarding Ready-to-progress criteria

The majority of the criteria fit with the National Curriculum year group expectations, however some do not. These are outlined here:

Year 1

1NPV-2

Reason about the location of numbers to 20 within the linear number system, including comparing using $<$ $>$ and $=$

The inequalities signs $<$ and $>$ are a Year 2 requirement of the national curriculum.

1AS-1

...including recognising odd and even numbers.

Recognising odd and even numbers is a Year 2 requirement of the national curriculum in the multiplication and division strand.

1G-1

Recognise common 2D and 3D shapes presented in different orientations, and know that rectangles, triangles, cuboids and pyramids are not always similar to one another.

This is accurate and in line with national curriculum requirements but the specific Teaching Guidance for Year 1 includes cylinders that are not a requirement of the Year 1 national curriculum.

Year 2

2NF-1

Secure fluency in addition and subtraction facts within 10, through continued practice.

The Year 2 requirement of the national curriculum is *Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100.*

2AS-1

Add and subtract across 10.

Add and subtract one-digit and two-digit numbers to 20, including 0 is a Year 1 requirement in the national curriculum.

Year 3

3NF-2

Recall multiplication facts, and corresponding division facts, in the 10, 5, 2, 4 and 8 multiplication tables... As there is no equivalent ready-to-progress criterion for Year 2, it is important to note that recalling multiplication and division facts for the 2, 5 and 10 multiplication tables is a Year 2 requirement and part of the end of Key Stage 1 assessment criteria.

3F-1

Interpret and write proper fractions to represent 1 or several parts of a whole that is divided into equal parts.

Recognise, find name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$ of a length, shape, set of objects or quantity is a Year 2 requirement of the national curriculum and part of the end of key stage 1 assessment criteria.

Year 4

4MD-3

Understand and apply the distributive property of multiplication.

This would fit better in Year 3 alongside the mental and written calculation strategies that are learned in which the distributive property is applied.

4F-2

Convert mixed numbers to improper fractions and vice versa.

The national curriculum requirement for Year 5 is *Recognise mixed numbers and improper fractions and convert from one form to the other*. Whilst we agree that this could be learned in Year 4, it should be acknowledged that it is in Year 5 of the national curriculum.

4G-2

Find the perimeter of regular and irregular polygons.

The national curriculum requirement in Year 3 is *Measure the perimeter of simple shapes*.

Year 5

5NPV-1 / NPV-2 / NPV-3

Know that 10 tenths are equivalent to 1 one, and that 1 is 10 times the size of 0.1.

Know that 100 hundredths are equivalent to 1 one, and that 1 is 100 times the size of 0.01.

Recognise the place value of each digit in numbers up to 2 decimal places...

Reason about the location of any number with up to 2 decimal places in the linear number system, including identifying the previous and next multiple of 1 and 0.1 and rounding to the nearest of each.

All of these would fit better as a Year 4 expectation alongside the national curriculum requirement in Year 4 *Recognise and write decimal equivalents of any number of tenths or hundredths*.

5F-1

Find non-unit fractions of quantities.

This begins in Year 2 and continues in Year 3 as *Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators*.

5F-2

Find equivalent fractions and understand that they have the same value...

This begins in Year 2 as *Recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$* and continues in Year 3 and Year 4 using diagrams to recognise and show equivalent fractions.