Mathematics

Year 6 Planning 2023-24

(Updated September, 2023)

This is a working document.

Teachers to make changes, where appropriate, based on both formative and summative assessment. Rich tasks and curriculum links are also to be identified and added to planning.

To build on from the Ready to Progress Criteria used in Summer 2021, we will be using the NCETM Progression documents.
Follow the link below to access the interactive copy of this curriculum map. Click on the domain to download the learning objectives for each domain.
https://www.ncetm.org.uk/classroom-resources/cp-year-6-curriculum-map/
Use the National Curriculum objectives sheet to ensure coverage of all objectives (see page 4).

	Unit	Unit name
Autumn 1	1	Calculating using knowledge of structures (1)
	2	Multiples of 1,000
Autumn 2	3	Numbers up to 10,000,000
	4	Draw, compose and decompose shapes
Spring 1	5	Multiplication and division
	6	Area, perimeter, position and direction
Spring 2	7	Fractions and percentages
	8	Statistics
Summer 1		KS2 tests
Summer 2	9	Ratio and proportion
	10	Calculating using knowledge of structures (2)
	11	Solving problems with two unknowns
	12	Order of operations
	13	Mean average

- Number and place value
- Addition and subtraction
- Multiplication and division
- Fractions
- Geometry
- Other

Year 6

Curriculum map

NCETM
NATIONAL CENTRE FOR EXCELLENCE IN THE TEACHING OF MATHEMATICS

June 2021

Year 6

1 Calculating using knowledge of structures (1)

- 6AS/MD–1 Understand that 2 numbers can be related additively or multiplicatively, and quantify additive and multiplicative relationships (multiplicative relationships restricted to multiplication by a whole number).
- 6AS/MD–2 Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding.
- 1.28 Common structures and the part–part–whole relationship
- 1.29 Using equivalence and the compensation property to calculate

2 Multiples of 1,000

- 1.26 Composition and calculation: multiples of 1,000 up to 1,000,000

3 Numbers up to 10,000,000

- 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).
- 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.
- 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.
- 6NPV–4 Divide powers of 10, from 1 hundredth to 10 million, into 2, 4, 5 and 10 equal parts, and read scales/number lines with labelled intervals divided into 2, 4, 5 and 10 equal parts.
- 1.30 Composition and calculation: numbers up to 10,000,000

4 Draw, compose and decompose shapes

- 6G–1 Draw, compose, and decompose shapes according to given properties, including dimensions, angles and area, and solve related problems.

5 Multiplication and division

- 6AS/MD–2 Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding.
- 2.18 Using equivalence to calculate
- 2.23 Multiplication strategies for larger numbers and long multiplication
- 2.24 Division: dividing by two-digit divisors
- 2.25 Using compensation to calculate

6 Area, perimeter, position and direction

- 2.30 Multiplicative contexts: area and perimeter 2

7 Fractions and percentages

- 6F–1 Recognise when fractions can be simplified, and use common factors to simplify fractions.
- 6F–2 Express fractions in a common denomination and use this to compare fractions that are similar in value.
- 6F–3 Compare fractions with different denominators, including fractions greater than 1, using reasoning, and choose between reasoning and common denomination as a comparison strategy.
- 3.8 Common denomination: more adding and subtracting
- 3.9 Multiplying fractions and dividing fractions by a whole number
- 3.10 Linking fractions, decimals and percentages

8 Statistics

- **This topic is part of the National Curriculum but is not included in the DfE 2020 guidance or the NCETM Mastery PD Materials.**

9 Ratio and proportion

- 6AS/MD–3 Solve problems involving ratio relationships.
- 2.27 Scale factors, ratio and proportional reasoning

10 Calculating using knowledge of structures (2)

- 6AS/MD–2 Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding.
- 1.29 Using equivalence and the compensation property to calculate

11 Solving problems with two unknowns

- 6AS/MD–4 Solve problems with 2 unknowns.
- 1.31 Problems with two unknowns

12 Order of operations

- 2.22 Combining multiplication with addition and subtraction
- 2.28 Combining division with addition and subtraction

13 Mean average

- 2.26 Mean average and equal shares

Number and place value

Number facts

Addition and subtraction

Multiplication and division

Fractions

Geometry

Other

Dark grey references are ready-to-progress criteria from the DfE Guidance 2020

Light grey references are from the NCETM Primary Mastery Professional Development materials

Both are available online

Where year group objectives have not been covered by the NCETM Prioritisation Guidance, these will be covered in additional units. These objectives will also be covered in **daily memory jogger activities** and the **daily arithmetic lesson**.

Please add any planned rich tasks and wider curriculum links that you use to deliver these objectives.

Term	Unit	Unit name	Learning Objectives/ Outcomes	Rich Tasks	Wider Curriculum Links
Autumn 1	1	Calculating using knowledge of structures (1)	*see learning outcomes detailed in curriculum map on website*		
	2	Multiples of 1,000	*see learning outcomes detailed in curriculum map on website*		
Autumn 2	3	Numbers up to 10,000,000	*see learning outcomes detailed in curriculum map on website*		
	4	Draw, compose and decompose shapes	*see learning outcomes detailed in curriculum map on website*		
Spring 1 1	5	Multiplication and division	*see learning outcomes detailed in curriculum map on website*		
	6	Area, perimeter, position and directions	*see learning outcomes detailed in curriculum map on website*		
Spring 2	7	Fractions and percentages	*see learning outcomes detailed in curriculum map on website*		
Summer 1	8	Statistics	Interpret and construct pie charts and line graphs and use these to solve problem Calculate and interpret the mean as an average.		
	KS2 Tests				
Summer 2	9	Ratio and proportion	*see learning outcomes detailed in curriculum map on website*		
	10	Calculating using knowledge of structures (2)	*see learning outcomes detailed in curriculum map on website*		
	11	Solving problems with two unknowns	*see learning outcomes detailed in curriculum map on website*		

	12	Order of operations	*see learning outcomes detailed in curriculum map on website*		
	13	Mean average	*see learning outcomes detailed in curriculum map on website*		

Strand	Year 6 National Curriculum Objectives showing coverage through NCETM Curriculum Prioritisation Guidance (COVID recovery)
N&PV	I can read, write, order and compare numbers up to 10,000,000 and determine the value of each digit
	I can round any whole number to a required degree of accuracy
	I can use negative numbers in context, and calculate intervals across 0
	I can solve number and practical problems that involve all of the above
A, S, M, and D	I can multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of
	I can divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division,
	I can divide numbers up to 4 digits by a two-digit number using the formal written method of short division where
	I can perform mental calculations, including with mixed operations and large numbers.
	I can identify common factors, common multiples and prime numbers
	I can use their knowledge of the order of operations to carry out calculations involving the 4 operations
	I can solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to
	I can solve problems involving addition, subtraction, multiplication and division
	I can use estimation to check answers to calculations and determine, in the context of a problem, an
Fractions, Decimals and Percentages	I can use common factors to simplify fractions; use common multiples to express fractions in the same
	I can compare and order fractions, including fractions >1
	I can add and subtract fractions with different denominators and mixed numbers, using the concept of
	I can multiply simple pairs of proper fractions, writing the answer in its simplest form
	I can divide proper fractions by whole numbers
	I can associate a fraction with division and calculate decimal fraction equivalents for a simple fraction.
	I can identify the value of each digit in numbers given to three decimal places and multiply and divide numbers
	I can multiply one-digit numbers with up to 2 decimal places by whole numbers
	I can use written division methods in cases where the answer has up to 2 decimal places
	I can solve problems which require answers to be rounded to specified degrees of accuracy
	I can recall and use equivalences between simple fractions, decimals and percentages, including in different
Ratio & Propor	I can solve problems involving the relative sizes of two quantities where missing values can be found by using
	I can solve problems involving the calculation of percentages and the use of percentages for comparison
	I can solve problems involving similar shapes where the scale factor is known or can be found
	I can solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.
Algebra	I can use simple formulae
	I can generate and describe linear number sequences
	I can express missing number problems algebraically
	I can find pairs of numbers that satisfy an equation with two unknowns
	I can enumerate possibilities of combinations of 2 variables.
Measurement	I can solve problems involving the calculation and conversion of units of measure, using decimal notation up to
	I can use, read, write and convert between standard units, converting measurements of length, mass, volume
	I can convert between miles and kilometres
	I can recognise that shapes with the same areas can have different perimeters and vice versa
	I can recognise when it is possible to use formulae for area and volume of shapes
	I can calculate the area of parallelograms and triangles
	I can calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic
Geometry	I can draw 2-D shapes using given dimensions and angles
	I can recognise, describe and build simple 3-D shapes, including making nets
	I can compare and classify geometric shapes based on their properties and sizes and find unknown angles in
	I can illustrate and name parts of circles, including radius, diameter and circumference and know that the
	I can recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find
	I can describe positions on the full coordinate grid (all 4 quadrants)
	I can draw and translate simple shapes on the coordinate plane, and reflect them in the axes.
Stats	I can interpret and construct line graphs and use these to solve problems
	I can interpret and construct pie charts and use these to solve problems
	I can calculate and interpret the mean as an average.

	1. Calculating using knowledge of structures (1)		8. Statistics
	2. Multiples of 1,000		9. Ratio and proportion
	3. Numbers up to 10,000,000		10. Calculating using knowledge of structures (2)
	4. Draw, compose and decompose shapes		11. Solving problems with two unknowns
	5. Multiplication and division		12. Order of operations
	6. Area, perimeter, position and direction		13. Mean average
	7. Fractions and percentages		

Pupils are to be given opportunities to apply their knowledge and understanding through problem solving and reasoning activities using the following criteria:

Problem Solving	Reasoning
Engage with mathematical activities and problems, making links and moving between different representations *(concrete, pictorial, abstract)* Independently choose to scaffold and represent thinking using concrete, pictorial or abstract representations, if required Identify and obtain information to solve mathematical problems and investigations from a range of contexts Make suggestions of ways to solve a range of problems Organise work from the outset, looking for ways to record and work systematically Find and predict possibilities that match the context using patterns spotted to support Independently check and improve work *(e.g. look for other possibilities, repeats, missing answers, errors and ways to improve)* Spot more complex patterns and begin to express generalisations/proof using symbolic notation Make and investigate conjectures and provide examples and counter-examples When they have solved a problem, pose a similar problem for a peer	Draw simple conclusions and give proof of reasoning using precise mathematical language Prove their understanding of more complex patterns by expressing generalisations/proof using symbolic notation Reflect on others' justifications and proof and use this to improve their work. Edit and improve their own and a peer's justification. Investigate 'what if?' questions. Create 'what if? 'questions to investigate