

Year 6 Programme of Study

Amended in response to school closures

School closure during the 2019-20 academic year will have had a significant impact on all pupils' mathematics learning. In some cases, this will have been beneficial for children's learning, providing them with more opportunities to explore maths in real-life contexts. Teachers have worked hard to provide home learning solutions, including online classrooms, investigations, and other home-learning materials; all of these will have supported pupils in making progress in mathematics. However, as pupils return to school, there will be uncertainty about the learning which has taken place. We have created amended Programmes of Study and Maths Meeting Guidance to help you understand the curriculum content which has likely been missed and plan for this.

What amended resources are we providing?

To support you in planning for the academic year 2020-2021, we are providing the following:

- amended Programmes of Study for Years 2 to 6
- amended Maths Meeting guidance, with summer term learning from the previous year group included in red, as this content may not have been taught
- an amended Yearly Planner which allows for the additional time required to teach extra lessons

The Yearly Planner is an editable Excel document and is available on our online platform.

How have we created the amended Programmes of Study?

We have taken the learning content that pupils may have missed during the summer term of the Mathematics Mastery curriculum of Years 1 to 5 and mapped out where this learning is required in Years 2 to 6. Using this, we have produced amended Programmes of Study for Years 2 to 6, which:

- explain key learning from the previous year and where it can be found
- suggest where you might want to teach lessons from the previous year's curriculum
- suggest revised durations for each unit

The number of extra lessons and unit length suggestions are for guidance only. The amount of time required for each unit will depend on the experiences your pupils have had during school closure. Do keep an eye on the Yearly Planner to ensure you are broadly on track to cover all the expected curriculum content across the year.

How should I use these additional resources?

The amended Programmes of Study are written on the assumption that the pupils have missed the previous summer term's learning. Of course, this may not always be the case where home learning has taken place. We recommend firstly speaking to your pupils' teacher(s) from the previous year to find out what home learning was provided during school closure (whilst acknowledging that not all pupils may have accessed this). They will also be able to tell you which parts of the previous year's curriculum they had covered before school closure, bearing in mind that the amended Programmes of Study only take account of missed summer term learning.

We then advise reading through the whole amended Programme of Study for the year you are teaching, to get a sense of the learning which has been missed and how we have recommended ensuring it is covered. We recommend visiting the professional development on our online platform for missed units from the previous year to familiarise yourself with the content.

There are links to the previous year's missed units in the amended Programme of Study.

Once you have a good understanding of where the key bits of missed learning fit within the year, consider where you can use Maths Meetings to pre-teach concepts and/or language. If the missed learning is only required in the summer term, you may be able to sufficiently cover any missed learning throughout the year, through Maths Meetings and in other areas of the curriculum, so that the summer term units for 2029-21 can be taught as planned.

In some cases, we have lengthened units by a week. In these cases, you may wish to keep the learning blocked as we have planned, or you may prefer to split the unit into two shorter units, particularly where the content is more self-contained, e.g. shape.

Will I still be able to teach the whole curriculum in a year?

The normal Mathematics Mastery curriculum consists of 30 weeks of planned lessons (including consolidation lessons) per year group. There are 38 weeks in the school teaching year. To accommodate the missed learning, we have recommended lengthening some units. You will therefore notice that the Yearly Planner is 'fuller' than normal, with fewer consolidation weeks. By following the amended Programme of Study, which introduces any missed content 'just in time', you should be able to ensure pupils catch up on any missed learning as well as covering all the essential elements of the year's curriculum.

Can I just teach lessons from the previous year without adapting them?

Where we have suggested teaching lessons from the previous year, adaptations will be necessary, as is always the case. This may be simply altering the context of a lesson to something with which pupils are familiar. It could also involve adapting the representations and language used as well as the tasks themselves.

In some cases, we have suggested reading through a sequence of lessons and adapting these according to your pupils' needs. For example, two lessons may have a similar focus and you might amalgamate them, choosing a task from each, as you know your pupils will benefit from them. Alternatively, you might take the key learning from three lessons and plan one lesson which incorporates the main ideas side-by-side.

Amended Year 6 Programme of Study

These are Mathematics Mastery's suggestions for amendments to units based on content that pupils will have missed in the summer term in the previous academic year.

The Year 5 summer term units are:

- Unit 10: Converting units of measure (2 weeks)
- Unit 11: Calculating with whole numbers and decimals (3 weeks)
- Unit 12: 2-D and 3-D shape (2 weeks)
- Unit 13: Volume (1 week)
- Unit 14: Calculating with whole number and decimals (2 weeks)

There is a lot of content in the summer term of Year 5. Year 6 teachers will need to use their own assessments and judgement to decide what to prioritise. Units 11 and 14 are significant in their exploration of decimals and extension of calculation strategies to include decimals. Ideally, we would recommend teaching both Units 10 and 14 in their entirety, though we recognise there is unlikely to be time for this. The Programme of Study contains our recommendations for how the key ideas can be woven into the Year 6 units.

A significant amount of learning about measure also takes place in the summer terms of Year 5. We recommend trying to spend as much time as possible on this in Maths Meetings throughout the year. See the amended Maths Meeting guidance for recommendations.

The pink boxes contain abridged curriculum notes. These are Mathematics Mastery's suggestions for amendments to units based on content that pupils will have missed in the summer term 2020. Please also refer to the Yearly Planner to see how we expect the adapted unit lengths to fit into the school calendar.

Autumn term

<p>Unit 1 Integers & Decimals</p> <p>(2 weeks)</p>	<p>Year 6 Unit 1 Lesson 8 explores addition and subtraction involving decimals. Pupils will have missed <u>Year 5 Unit 11: calculating with whole numbers and decimals</u>, so this may be an area in which they are less secure. Depending on pupils' confidence in Lesson 8, you may wish to teach Year 5 Unit 11 Lessons 4 and 5, to provide time for exploration and consolidation of decimal addition and subtraction strategies.</p> <ul style="list-style-type: none"> • read, write, order and compare numbers up to 10 000 000 and determine the value of each digit • round any whole number to a required degree of accuracy • solve problems involving addition and subtraction • solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
<p>Unit 2 Multiplication and division</p> <p>(4 weeks)</p>	<p>Pupils will have missed Unit 11 and Unit 14 from the summer term of Year 5, which share the name 'calculating with whole numbers and decimals'. The elements of <u>Year 5 Unit 11</u> which are relevant pre-learning for Year 6 Unit 2 are:</p> <ul style="list-style-type: none"> • explore decimal place value through a range of representations (L1) • multiply and divide by 10, 100 and 1000 (L2) • derive decimal multiplication facts (L7) • short multiplication including decimals (L8) • exploring multiplication strategies (L9)

- long multiplication (L13 and L14)

The elements of **Year 5 Unit 14** which are relevant pre-learning for Year 6 Unit 2 are:

- interpreting remainders including rounding up and down, as decimals and as fractions

As a significant amount of key learning in the summer term of Year 5 has been missed, the way you teach this unit will depend on pupils' starting points. We give a suggested structure below, but you will need to respond to pupil progress and need throughout.

Recommended structure:

- **Year 5 Unit 11 Lesson 1.** This lesson focuses on developing pupils' conceptual understanding of decimal place value to 3d.p. through use of representations including Dienes, place value counters and fraction/decimal additions, e.g. $1.923 = 1 + 0.9 + 0.02 + 0.003$
- **Year 6 Unit 2 Lesson 1.** This lesson builds on the Year 5 lesson, requiring pupils to apply their understanding to compare decimals, including those with different numbers of decimal places
- **Year 5 Unit 11 Lesson 2.** This lesson helps pupils to apply their understanding of decimal place value to multiplication and division by 10, 100 and 1000. It scaffolds pupils' understanding of how this links to metric measures. This will lead into Year 6 Unit 2 Lesson 2, which assumes a prior understanding of the link to converting measures. This is particularly important as pupils will also have missed **Year 5 Unit 10: converting units of measure** (see Year 6 Unit 8 for more on this).
- **Year 6 Unit 2 Lesson 2.** Applying and consolidating multiplication and division by 10, 100 and 1000 and its application to converting measures from the previous lesson.
- **Year 6 Unit 2 Lessons 3 and 4.** Common factors, common multiples and primes.
- **Year 5 Unit 11 Lesson 7.** This lesson focuses on deriving decimal multiplication facts using place value knowledge. It looks at how the distributive property of multiplication can be used alongside derived facts to calculate e.g. 23.6×4 ($20 \times 4 + 3 \times 4 + 0.6 \times 4$)
- **Year 6 Unit 2 Lesson 5.** Focus on reasoning involving derived facts.
- **Year 6 Unit 2 Lessons 6 and 7.** These both explore short multiplication involving decimals. Be sure to involve pupils in using place value counters to represent calculations (as they will have missed some of these experiences in Year 5). Accompanied by the right discussions, this will help pupils to recognise that decimal short multiplication is an extension of the algorithm (and underlying structure) they understand.

- **Year 5 Unit 11 Lesson 13.** Pupils have been introduced to long multiplication in Year 5 Unit 4. This lesson reinforces how the area model links to the formal written algorithm.
- **Year 6 Unit 2 Lesson 8.** This lesson builds on pupils' understanding of long multiplication to include decimals.
- **Year 6 Unit 2 Lessons 9 to 12**
- Depending on how much time you have spent on this unit so far, as well as pupils' understanding, you may wish to teach **Year 5 Unit 14 Lessons 2 and/or 3**, which focus on interpreting remainders in division.
- **Year 6 Unit 2 Lessons 13 and 14**

Year 6 Unit 2 is normally a 3-week unit with 13 planned lessons and 2 consolidation lessons. We have planned for at least 4 extra Year 5 lessons to be taught this year, bringing the total number of planned lessons to 17. We have therefore allowed 4 weeks for this unit this year.

- identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places
- use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy
- multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
- multiply one-digit numbers with up to two decimal places by whole numbers
- divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context
- divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context
- use written division methods in cases where the answer has up to two decimal places
- identify common factors, common multiples and prime numbers
- perform mental calculations, including with mixed operations and large numbers
- solve problems which require answers to be rounded to specified degrees of accuracy

Unit 3 Calculation problems
(2 weeks)

- find pairs of numbers that satisfy an equation with two unknowns
- enumerate possibilities of combinations of two variables
- use knowledge of the order of operations to carry out calculations involving the four operations
- generate and describe linear number sequences
- express missing number problems algebraically
- solve problems involving addition, subtraction, multiplication and division

<p>Unit 4 Fractions (2 weeks)</p>	<ul style="list-style-type: none"> • use common factors to simplify fractions; use common multiples to express fractions in the same denomination • compare and order fractions, including fractions > 1 • associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, $\frac{3}{8}$] • recall and use equivalences between simple fractions and decimals, including in different contexts • generate and describe linear number sequences (with fractions) • add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
<p>Unit 5 Missing angles and lengths (1 week)</p>	<p>Pupils will have missed Year 5 Unit 12: 2-D and 3-D shape. The learning from this unit which is relevant to Year 6 Unit 5 is:</p> <ul style="list-style-type: none"> • identifying, comparing and classifying triangles and quadrilaterals based on their properties • exploring diagonals of quadrilaterals <p>The term 'diagonal' is introduced in the Year 5 unit.</p> <p>Year 6 Unit 5 Lesson 2 provides opportunity for revision of triangle names and properties, as well as for problem solving and mathematical thinking. The terms equilateral, scalene and isosceles were learnt in Year 4 and should have been revised in Maths Meetings since. We recommend teaching Year 6 Unit 5 Lesson 2 as planned. If pupils are particularly insecure in their understanding of the properties of different triangles, refer to Year 5 Unit 12 Lesson 3 for consolidation ideas.</p> <p>Year 6 Unit 5 Lesson 3 provides opportunity for revision of quadrilateral names and properties, as well as exploration of their internal angles. The terms rhombus, parallelogram and trapezium were learnt in Year 4 and should have been revised in Maths Meetings since. However, the term diagonal would have been introduced in Year 5 Unit 12 and so may be new to pupils. We recommend teaching Year 6 Unit 5 Lesson 3 as planned, taking account of pupils' current awareness of specific language definitions. If pupils are insecure in their understanding of quadrilaterals, refer to Year 5 Unit 12 Lessons 4 and 5 for consolidation ideas.</p> <p>Year 6 Unit 5 is normally a 1-week unit with 5 planned lessons and no consolidation lessons. We have scheduled it for 1 week again this year; however, you may need to use a couple of extra lessons, depending on what has previously been covered in Maths Meetings and pupils' confidence levels.</p> <ul style="list-style-type: none"> • recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles. • express missing number problems algebraically • compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons

Spring term

<p style="text-align: center;">Unit 6 Coordinates and shape (2 weeks)</p>	<p>Pupils will have missed Year 5 Unit 12: 2-D and 3-D shape. The learning from this unit which is relevant to Year 6 Unit 6 is:</p> <ul style="list-style-type: none"> • identifying, comparing and classifying 3-D shapes based on their properties • recognising 2-D representations of 3-D shapes • constructing 3-D shapes from their nets • illustrating and naming parts of circles <p>Hopefully you have had opportunities to revise 3-D shape names and other key vocabulary such as face, edge, vertex through sorting and classifying tasks in Maths Meetings. If pupils are not secure in their understanding of the properties of 3-D shapes, you may wish to teach Year 5 Unit 12 Lesson 7 to consolidate this learning, before moving on to teach Year 6 Unit 6 Lessons 8 and 9.</p> <p>Pupils will have missed Year 5 learning about nets. While we do not think it will be necessary to teach the Year 5 lessons to enable pupils to access Year 6 Unit 6 Lessons 8 and 9, you might want to look at the Year 5 lessons to see what was missed and bear this in mind when teaching the Year 6 lessons.</p> <p>The final lesson of Year 6 Unit 6 focuses on circle properties and problem solving using this knowledge. Be aware that pupils will have missed the introduction to the language 'radius', 'diameter' and 'circumference' in Year 5 Unit 12 Lesson 10.</p> <p>Year 6 Unit 6 is normally a 2-week unit with 9 planned lessons and 1 consolidation lesson. We think it should be possible to teach this unit in 2 weeks this year also.</p>
<p style="text-align: center;">Unit 7 Fractions</p>	<ul style="list-style-type: none"> • use negative numbers in context, and calculate intervals across zero • describe positions on the full coordinate grid (all four quadrants) • draw 2-D shapes using given dimensions and angles • draw and translate simple shapes on the coordinate plane, and reflect them in the axes • recognise, describe and build simple 3-D shapes, including making nets • illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius • solve number and practical problems that involve all of the above • multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$]

<p>(1 week)</p>	<ul style="list-style-type: none"> • divide proper fractions by whole numbers [for example, $\frac{1}{3} \div 2 = \frac{1}{6}$] • recall and use equivalences between simple fractions and decimals, including in different contexts
<p>Unit 8 Decimals and measures (4 weeks)</p>	<p>Pupils will have missed <u>Year 5 Unit 10: converting units of measure</u>. In Year 5 Unit 10, pupils explore metric conversions (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram) as well as conversions between miles and km and lbs and kgs.</p> <p>Despite missing this unit, pupils should have revisited metric and imperial conversions in Maths Meetings in Year 5, as well as Year 6. We recommend you use your assessment of pupils so far this year to inform the extent to which you adapt Unit 8.</p> <p>Year 6 Unit 8 Lessons 1 and 2 You should be able to teach Year 6 Unit 8 Lessons 1 and 2 as planned.</p> <p>Year 6 Unit 8 Lessons 3 to 8 Year 6 Unit 8 Lesson 3 covers metric and metric/imperial length conversions. Depending on your coverage so far this year, as well as pupils' experiences in Maths Meetings in the first two terms of Year 5, it could be the case that pupils have had little practice converting lengths since Year 4 Unit 10. We recommend looking at Year 5 Unit 10 Lessons 3, 4 and 6, and teaching these as appropriate to allow pupils enough time to consolidate their understanding of length conversion.</p> <p>Year 6 Unit 8 Lessons 9 and 10 Pupils have also missed <u>Year 5 Unit 13: volume</u>. In this four-lesson unit, pupils are introduced to cubic centimetres as a measure of volume, as well as the cubed notation ³ (linking this to squared notation). We recommend teaching Year 5 Unit 13 Lessons 1 to 3 before teaching Year 6 Unit 8 Lessons 9 and 10. After teaching the three Year 5 lessons, you may want to adapt/shorten the Year 6 lessons.</p> <p>Year 6 Unit 8 Lessons 11 to 13 Year 6 Unit 8 Lesson 11 explores g/kg conversion and Lesson 12 explores converting between imperial measures of length, volume and mass. If pupils have had time to build their understanding of metric and imperial length conversion earlier in this unit, we think these lessons can be taught as planned. However, bear in mind that a consolidation lesson may be required. If pupils require extra consolidation of these ideas, look at Year 5 Unit 10 Lessons 7 and 8, which explore metric and imperial mass conversions.</p>

	<p>Year 6 Unit 8 Lessons 14 and 15</p> <p>The final two lessons of Year 6 Unit 8 focus on converting between units of time and solving time problems. If time conversion has been built into Maths Meetings throughout Year 6, these lessons can be taught as planned. You may wish to refer to Year 5 Unit 10 Lessons 1 and 2 if pupils find this concept particularly difficult.</p> <p>Year 6 Unit 8 is normally a 3-week unit with 15 planned lessons. We imagine this will require 4 weeks this year, and perhaps even a couple more lessons.</p> <ul style="list-style-type: none"> • solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate • use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places • convert between miles and kilometres • recognise that shapes with the same areas can have different perimeters and vice versa • recognise when it is possible to use formulae for area and volume of shapes • use simple formulae • calculate the area of parallelograms and triangles • calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm³) and cubic metres (m³), and extending to other units [for example, mm³ and km³] • generate and describe linear number sequences (with decimals)
<p>Unit 9 Percentages and statistics (2 weeks)</p>	<ul style="list-style-type: none"> • recall and use equivalences between simple fractions, decimals and percentages, including in different contexts • solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison • interpret and construct pie charts and line graphs and use these to solve problems • calculate and interpret the mean as an average
<p>Unit 10 Proportion problems (2 weeks)</p>	<ul style="list-style-type: none"> • solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts • solve problems involving similar shapes where the scale factor is known or can be found • solve problems involving unequal sharing and grouping using knowledge of fractions and multiples

Summer term

We do not provide specific curriculum guidance for Year 6 in the summer term. Schools should instead plan to use the term to consolidate and apply previously learnt topics using their own assessments to identify which areas need further development.

Schools should also allow time to prepare children for KS2 tests in May and transition to Year 7 in early July.