Sumdog Pathway to Multiplication Success

Using Sumdog to build **conceptual understanding** of multiplication and number in order to increase **fluency, speed, accuracy and automaticity**.

Your pathway to success for the Year 4 MTC!

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Introduction

Our multiplication mission

At Sumdog, we know that trying to develop children's mathematical fluency whilst also preparing them for the high-pressure Year 4 Multiplication Tables Check (MTC) can be a real source of stress for teachers. That is why we have created the Sumdog pathway to multiplication success – a scheme of learning covering multiplication for Years 1–4, designed to build automaticity *and* conceptual understanding.

Familiarity and proficiency with multiplication facts free up children's working memories and enable them to better apply their maths skills to more complex problems. Fluent multiplication fact recall also lays the foundations for higher learning concepts such as division, fractions, long multiplication and algebra, in both educational and 'real-life' contexts.

Understanding or memorising?

Should children therefore be forced to memorise multiplication facts?

Times table facts give children the opportunity to see for themselves the beauty within numbers and the complex patterns and relationships that lie within them. By learning to multiply, they can develop a deeper understanding of our number system – the grouping of sets, arrays, repeated addition and faster ways of adding.

Furthermore, playing with patterns and relationships leads to skip counting, doubling, halving and additional mental agility strategies that naturally bridge the gap between simply memorising the facts for quicker recall and actually understanding the concepts of multiplication.

Teaching multiplication in this way results in the organic memorisation of facts, but children need the opportunity to build their recall by practising and applying their learning. This is where Sumdog, and in particular the Sumdog Multiplication Table Checker, can support the daily practice of tables.

Children who truly understand the underlying concepts of multiplication are able to train their brains to pay attention to detail and process complicated calculations by applying mathematical logic with accuracy, fluency and speed.

So at Sumdog, we believe that deep and meaningful memorisation comes with understanding and our fun, engaging, low-stakes practice gives children the opportunity to gain that understanding – by exploring, practising, making mistakes and enjoying the beauty of numbers.

The need for speed

At Sumdog we recognise that multiplication table checks can be a source of stress and anxiety for some children. This can often lead to difficulties with recall and can sadly even put them off maths for life.

While most educators agree that children being able to recall multiplication facts quickly is a good thing, insisting that they are recalled within a set time is often met with apprehension from teachers. This requirement for faster recall can often lead to children being forced to simply memorise multiplication facts.

Therefore, we have deliberately made our platform as engaging as possible for children, providing them with opportunities to learn from their mistakes through fun and interactive games. We ensure they remain motivated to continue with their practice by rewarding their effort with coins that they can spend in their Sumdog house and garden or on their avatar.

At Sumdog, we believe that all children can succeed with the right support, and this belief is at the core of our mission to close the attainment gap and ensure that every child has the opportunity to thrive.

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DfE Multiplication Tables Check

The multiplication tables check (MTC) designed by the Department for Education (DfE) is a statutory assessment for year 4 pupils, which effectively provides a deadline by which children should know their tables to 12.

The content of this test alone can be daunting, and the online format and presentation of the questions can constitute an additional unfamiliar element for children.

The MTC follows the following format:

+ **The test checks Year 4 pupil recall with 25 questions.**
+ **The pupil has six seconds to answer each question.**
+ **While pupils do not see their results, they have to answer all 25 questions correctly to pass the test.**
+ **The test focuses on tables 2–12, with a special focus on 6, 7, 8, 9 and 12 times tables.**
+ **The test is conducted online.**

Progression to this assessment needs to be planned carefully to ensure that children are supported to achieve, that their mental health is protected and that they continue their education with the necessary foundations to succeed. The Sumdog pathway to multiplication success therefore embeds tried, tested and researched methodologies and pedagogy in our fun, engaging platform to prepare children for this statutory assessment and beyond.

The Sumdog Multiplication Check

One of the tools we have to support your pupils is the Sumdog Multiplication Table Check. This closely replicates the format that pupils will experience in the official statutory test from the Department for Education.

Our MTC replica will help your pupils become familiar with the online format and question presentation in a friendly, low-stakes environment.

Practice makes progress

Using our MTC tool alongside our pathway will prepare, support and equip your pupils to confidently, accurately and fluently complete the official MTC. This will not be achieved by simply memorising facts but through progressive, conceptual development of understanding that sets them up for Year 5 and beyond.

What is Sumdog's MTC?

The Sumdog Multiplication Check tool is available to all users alongside our pathway to multiplication success. Furthermore, our heat map score report provides insight for teachers on which pupils require additional support and helps identify next steps for learners. This will allow you to plot a non-stressful pathway for your pupils to build confidence, recall and fluency that they can effectively apply to the statutory assessment.

So in summary, our MTC tool:

✓ Is available to all users.
✓ Replicates the statutory assessment in a fun and engaging way.
✓ Includes insights and heat maps to identify next steps in learning.

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The Sumdog Pathway to Multiplication Success

By following the Sumdog pathway to multiplication success, you will use our platform as a way to bring fun into daily fluency practice. Our National Curriculum-aligned Sumdog skills provide a means to naturally develop greater recall and understanding of multiplication facts, using our broad range of progressive and varied question content.

The Sumdog pathway to success in multiplication can be used alongside any existing schemes of work or resources you use within your classroom, and is certainly not designed to replace them. Instead, the pathway outlines how Sumdog can be used to complement, supplement and enhance your existing curriculum.

Unlike other ed-tech companies, Sumdog does not just provide opportunities to practise and develop recall speed and fluency. Our structured pedagogy and progressive question content develop pupils' conceptual understanding of multiplication, which in turn leads to increased accuracy speed, overall fluency and the application of skills beyond the year 4 MTC.

Our pathway encourages you to explore your pupils' thinking – using what, why and how they learn to form strategies for overcoming challenges.

Sumdog develops conceptual understanding and supports teaching and learning.		**Sumdog ALSO provides opportunity to build speed and fluency, in a fun and engaging way.**
1. Sample questions within teaching		**1.** Sumdog MTC preparation
2. Sumdog pedagogy and journey		**2.** Multiplication Focus in games
3. Low-stakes tests		**3.** Challenges to motivate
4. Reporting and insights		**4.** Competition to gain recognition
5. Home learning links		**5.** Contests that boost confidence

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Conceptual Understanding vs Automaticity

If you are training to become a swimming champion, the ultimate goal is to be the fastest swimmer.

However, to become the fastest, you don't just jump in and swim as fast as you can. Over the course of your training, you develop different skills such as strokes, turns and breathing. Then as these skills develop, your overall pace increases.

Automaticity of multiplication facts learned by rote can be counter productive. Pupils may have memorised their times tables, but would they necessarily know that 4 x 8 is the same as 8 x 4 without remembering each fact individually?

At Sumdog, we build **conceptual understanding** of multiplication from Year 1 and provide you with a range of tools to build on this foundation. This multiplication pathway will give your pupils the opportunity to explore strategies, enquire and problem solve, alongside developing their **automaticity, fluency, accuracy and speed**.

Conceptual understanding

+ Progressive questions that develop strategies
+ Commutative, associative and distributive properties explored
+ Pathway to success
+ In game practice with thinking time
+ Patterns and relationships

Automaticity

+ Timed daily practice opportunties
+ Sumdog MTC replica to assess speed, accuracy and fluency
+ Build pupil confidence with Sumdog garden, house and avatar personalisation
+ Sumdog contests to motivate and inspire

As pupils enter Year 4, you can use the Sumdog MTC planning documentation to focus and consolidate times table knowledge and develop automaticity alongside conceptual understanding.

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Sumdog Premium

The Sumdog pathway to multiplication success recommends the use of features which are included with a Premium Sumdog account. Visit **sumdog.com** to try our multiplication tools with a 30-day trial.

Premium Features
Over 30 engaging games for children to choose from
Set challenges on curriculum-aligned topics that directly match in-class teaching
Set personalised practice for times tables and use our pupil chooser to easily and subtly differentiate
Practise for the MTC with our MTC assessment replica
Compete in online regional and national contests every term
Create custom formative assessments or choose ready-made curriculum-aligned tests to target intervention
Instant reporting to identify gaps in understanding
Demonstrate impact with tracking reports for your whole school, year groups, classes and individuals
Full support with set-up and regular communication from our Support team

"We know short bursts of just 10-15 minutes on Sumdog each day can have a big impact."
Neil Kelsall, National Lead Practitioner for Oasis Community Learning

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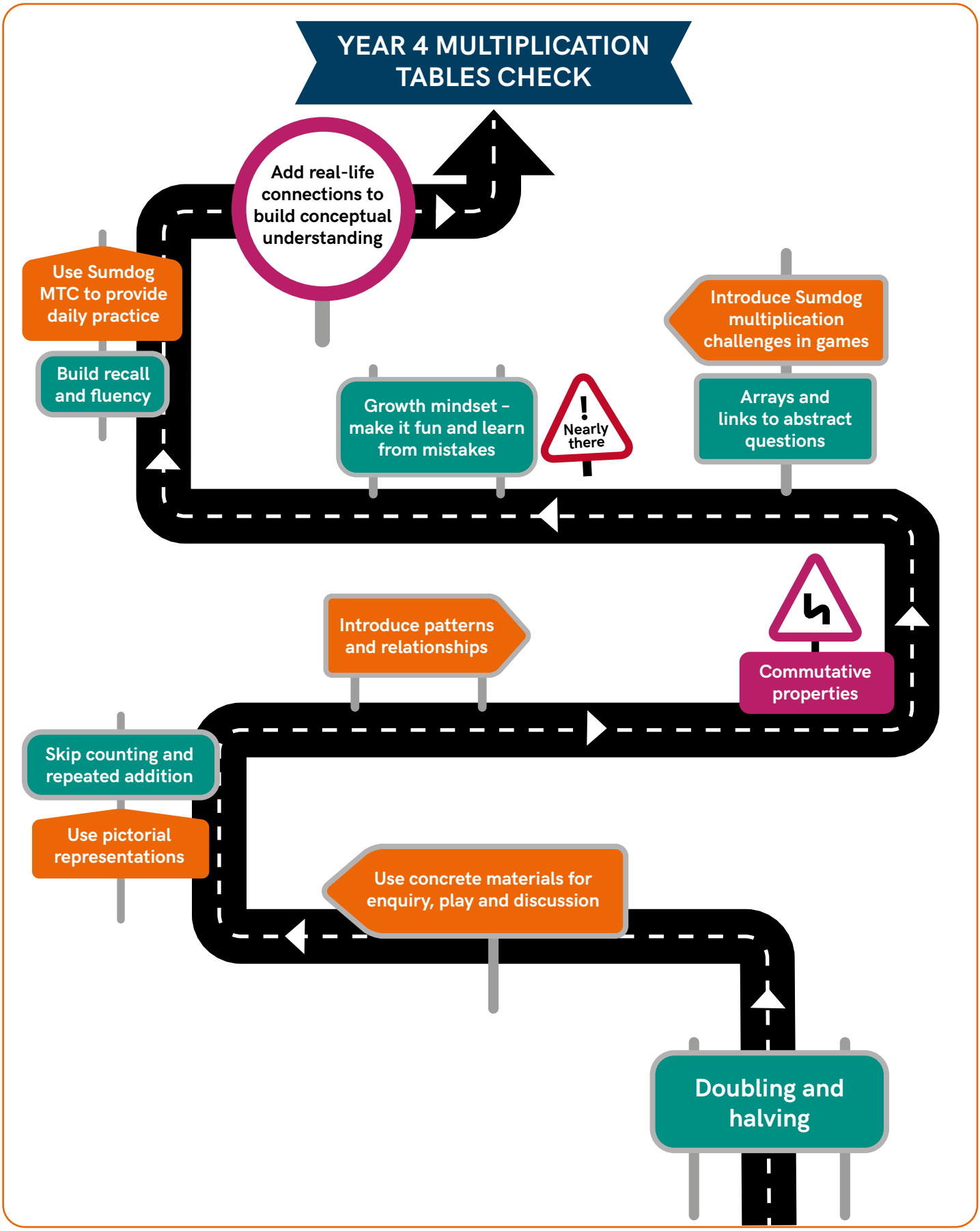
The Sumdog Pathway to Multiplication Success – A Visual Guide



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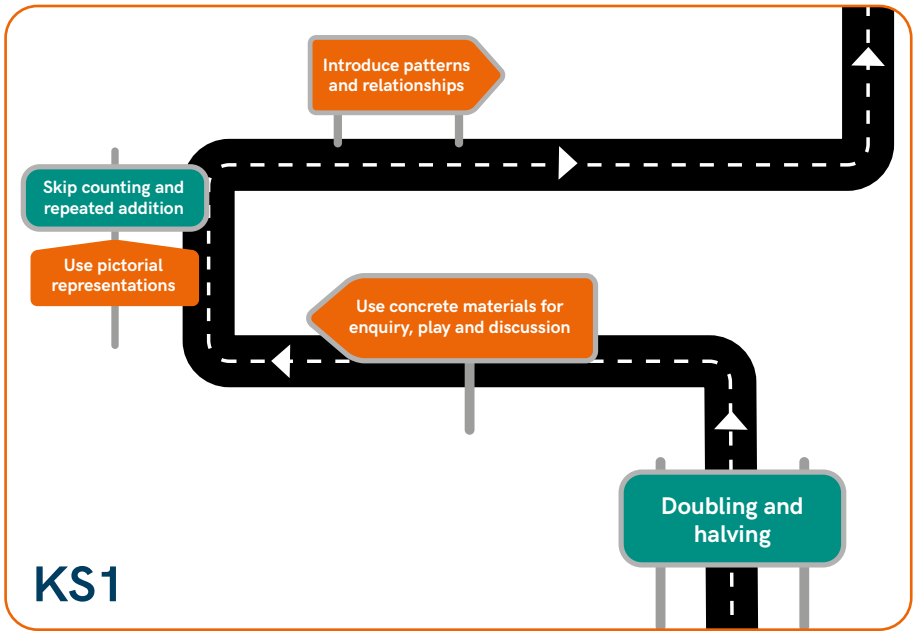
DfE Link
The principal focus of mathematics teaching in Key Stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the 4 operations, inclusive of using practical resources [for example, concrete objects and measuring tools].



The first half of our Sumdog learner journey focuses on the key principles of KS1.

+ **Developing learner confidence through our fun and engaging games.**
+ **Increasing fluency through regular Sumdog practice, National Curriculum-aligned focus skills for challenges and easy-to-use pictorial representations to support and scaffold learning.**
+ **Supporting teachers to build on learning organically, in line with the requirements of the Programme of Study for Mathematics.**

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Related DfE Links (Statutory and non-statutory)

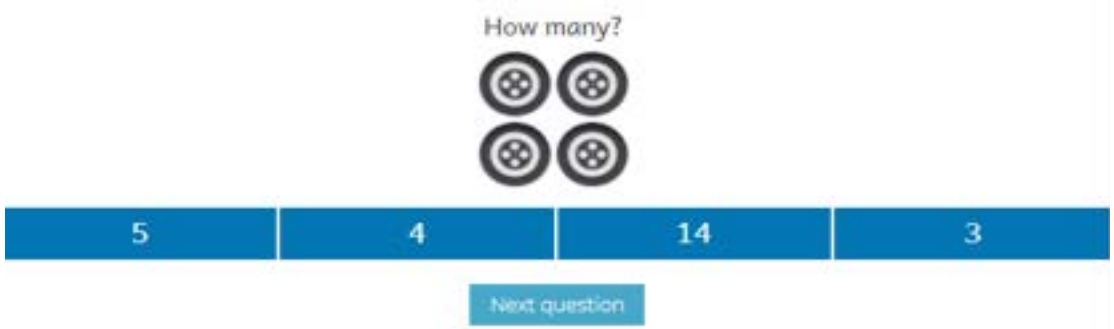
- Identify and represent numbers using objects and pictorial representations.
- Practise counting as reciting numbers and counting as enumerating objects, and counting in 2s, 5s and 10s from different multiples to develop their recognition of patterns in the number system.
- Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.
- Through grouping and sharing small quantities, pupils begin to understand multiplication and division; doubling numbers and quantities; and finding simple fractions of objects, numbers and quantities.
- They make connections between arrays, number patterns, and counting in 2s, 5s and 10s.
- Recognise, find and name a half as 1 of 2 equal parts of an object, shape or quantity.

YEAR 1 – Sumdog pathway to multiplication success

Key Sumdog Skills: 1.N.NPV3, 1.N.NPV4

Children are provided with the opportunity to skip count in 2s, 5s, and 10s and to explore number through engaging pictorial representations.

Our adaptive learning algorithm works with our skills to progressively scaffold and support learning, enabling children to make connections with number so they start to recognise the patterns and natural beauty of numerical relationships, particularly by using pictorial arrays.



Sample questions such as the above begin to introduce the idea of sets and groupings of objects, and arrays are made up of rows and columns which are commutative in nature.

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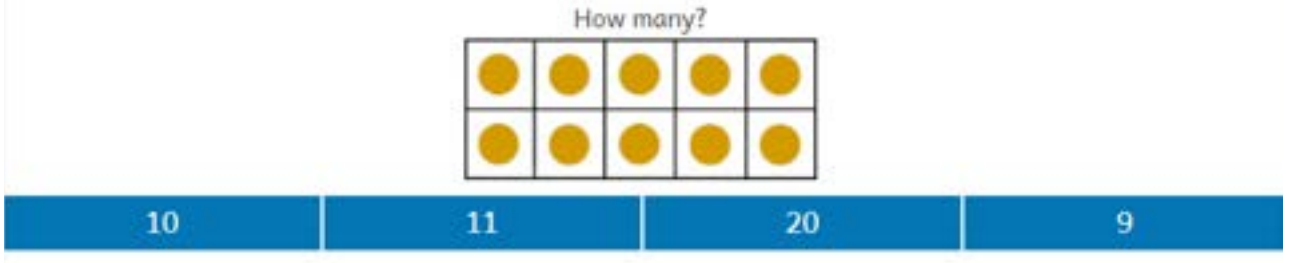
For children to engage fully with their learning, they should be equipped with the vocabulary necessary to make connections and build their metacognition. Opportunities to explore and enquire around their learning in practical ways can lead to a deeper understanding of number.

For example: 3 x spoonfuls of sugar, 2 x chocolate buttons per child.

How many lots (sets)?
How many (how much) altogether, per, each?

There are 100s of iterations of each Sumdog question, giving your pupils plenty of practice of concepts within the games they play.



Questions such as the above introduce the commutative principle in multiplication, i.e. a x b and b x a are equal, 2 lots of 5 are the same as 5 lots of 2. Why not display a Sumdog question on your smartboard and begin these rich discussions around arrays?

At Sumdog, we would encourage the use of concrete materials throughout all stages of mathematics to allow pupils to manipulate, explore and investigate the patterns and relationships physically, before moving on to Sumdog practice activities. This process can be achieved by applying a play approach and by integrating Sumdog into the everyday classroom environment early.

Sumdog Assessment Opportunity

Our pre-made tests group our questions to cover and assess the statutory requirements of the National Curriculum at year 1. They provide a means to assess pupil progress in a low-stakes, formative way. They also familiarise children with the process of completing tests online and outside of our games. The reporting and insights that our test reports provide will allow you to plan the next step in the pathway.

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Related DfE Links (Statutory and non-statutory)

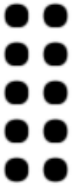
- Count in steps of 2, 3, and 5 from 0, and in 10s from any number, forward and backward.
- They count in multiples of 3 to support their later understanding of a third.
- Using materials and a range of representations, pupils practise counting, reading, writing and comparing numbers to at least 100 and solving a variety of related problems to develop fluency.
- Recall and use multiplication and division facts for the 2, 5 and 10 times tables, including recognising odd and even numbers.
- Show that multiplication of 2 numbers can be done in any order (commutative) and division of 1 number by another cannot.
- Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.
- Pupils are introduced to the times tables. They practise to become fluent in the 2, 5 and 10 times tables and connect them to each other.
- Pupils work with a range of materials and contexts in which multiplication and division relate to grouping and sharing discrete and continuous quantities.

YEAR 2 – Sumdog pathway to multiplication success

Key Sumdog Skills: 2.N.MD.1, 2.N.MD.4, 2.N.MD.3

As the use of Sumdog increases within your classroom, why not try setting some focus skills around multiplication that children can try at home? The platform will be one they are familiar with and there is no marking for you to do, Sumdog will provide you with all the insights and reporting you need.

Begin to formally introduce the concept of doubling and halving to children, increasing the use of skip-counting and familiarity with simple multiplication facts.



2 + 2 + 2 + 2	2 + 2 + 2 + 2 + 2 + 2	10 + 10 + 10 + 10 + 10	2 + 2 + 2 + 2 + 2

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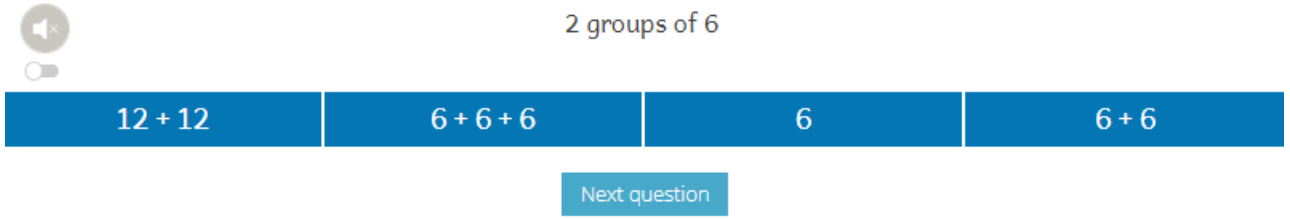
Sample questions such as the above begin to expand on the use of arrays in developing the conceptual understanding of multiplication.

We recommend still using concrete materials within the classroom to support this understanding, but as the children develop their metacognition abilities you can begin to expand and challenge their thinking around the concepts by posing questions verbally. For example:

I am not sure whether 2 x 5 is the same as 5 x 2?

Our pictorial questions make use of rectangular arrays to make the commutative property self-evident. And as always, you can set specific focus skills on Sumdog or let our algorithm adapt to your pupils. Sumdog questions such as the following example help cement the foundations of multiplicative relationships.



In turn, this leads to the development of mathematical language skills to communicate those foundations.

Similarly, as we begin to introduce doubling and halving children become aware of the scaling properties of multiplication and the repeated aggregation of numbers. Children begin to make the connection that unlike addition where we increase a quantity by a certain amount, with multiplication we are increasing a quantity by a scaling factor and the connections between numbers begin to fall into place. For example:

If I have 4 sets of 2 counters then how many counters altogether?

Teaching the statutory requirements of the Programme of Study at Key Stage 1 is in large part about developing pupils' confidence with number. Sumdog is the perfect platform to set low-stakes practice to bridge the gap between concrete materials and pictorial and abstract representations of number.

By the end of Year 2, children should know their 2, 5, 10 times tables, which form the basis of necessary understanding for upcoming work in Lower Key Stage 2.

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Ideas for using Sumdog effectively to build fluency in KS1:

- Display our sample questions on your smart board and use these as the basis to develop metacognition and the vocabulary of multiplication as a class.
- Set challenges on specific focus skills for use in the classroom and at home, making use of our extensive teaching reports to identify gaps in multiplication recall and inform next steps.
- Make use of our low-stakes pre-made tests to formatively assess your pupils' understanding and use our enhanced reporting to track and monitor progress.
- Encourage play, enquiry and the use of concrete materials in your classroom, and begin to connect concrete arrays to Sumdog pictorial questions. Most of our questions are read-aloud at this stage.
- Why not set your own, fun classroom competition or challenge focussed on the 2, 5 or 10 times tables? Unlike the statutory MTC, you can choose how many questions the pupils answer and reward them for their effort in our Sumdog house and garden.

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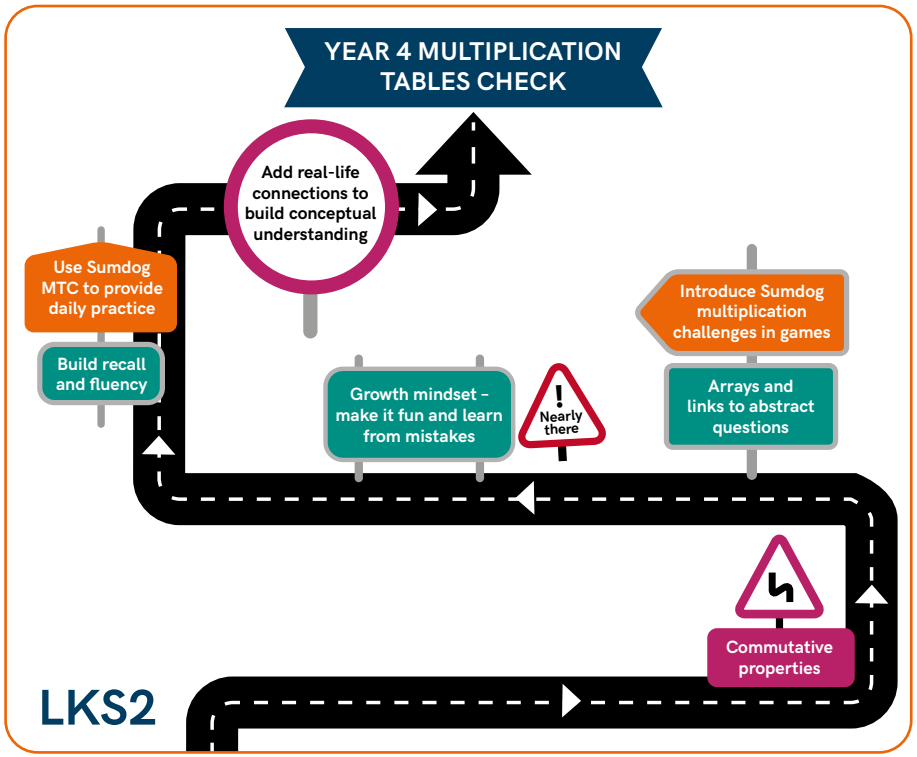
DfE Link
The principal focus of mathematics teaching in Lower Key Stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the 4 operations. By the end of Year 4, pupils should have memorised their times tables up to and including the 12 times table and should be able to show precision and fluency in their work.



As pupils continue their Sumdog learner journey, we begin to focus on the key principles of LKS2:

+ **Introducing and expanding on the commutative properties of multiplication.**
+ **Building recall and fluency through the use of the Sumdog MTC tool and real-life connections.**
+ **Encouraging a growth mindset approach to learning; children are going to make mistakes in their recall and should be reminded that this is OK.**

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Related DfE Links (Statutory and non-statutory)

- Recall and use multiplication and division facts for the 3, 4 and 8 times tables.
- Write and calculate mathematical statements for multiplication and division using the times tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods.
- Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.
- Pupils continue to practise their mental recall of times tables when they are calculating mathematical statements in order to improve fluency. Through doubling, they connect the 2, 4 and 8 times tables.
- Pupils develop efficient mental methods, for example, using commutativity and associativity (for example, $4 \times 12 \times 5 = 4 \times 5 \times 12 = 20 \times 12 = 240$) and multiplication and division facts (for example, using $3 \times 2 = 6$, $6 \div 3 = 2$ and $2 = 6 \div 3$) to derive related facts ($30 \times 2 = 60$, $60 \div 3 = 20$ and $20 = 60 \div 3$).
- Pupils solve simple problems in contexts, deciding which of the 4 operations to use and why. These include measuring and scaling contexts.

YEAR 3 – Sumdog pathway to multiplication success

Key Sumdog Skills: 3.N.MD.1, 3.N.MD.3, 3.N.MD.2

By this stage children will be familiar with the Sumdog platform, they will likely have used the coins they have been earning to decorate their house and garden, and will be used to taking part in school competitions and challenges and nationwide contests.

This stage presents an ideal opportunity to begin to introduce the Sumdog MTC and to do so without mentioning the statutory MTC that they will complete in Year 4. The Sumdog MTC closely replicates the statutory test so if you can build confidence using the Sumdog MTC, then you are setting your pupils up for success next year.

Your pupils do not need to worry, panic or stress about the statutory test as Sumdog is a familiar environment, but will still give them the opportunity to practise their recall and build fluency, as well as enabling you to identify the next steps in their learning.

We make it easy for you to differentiate the multiplication practice for your pupils.

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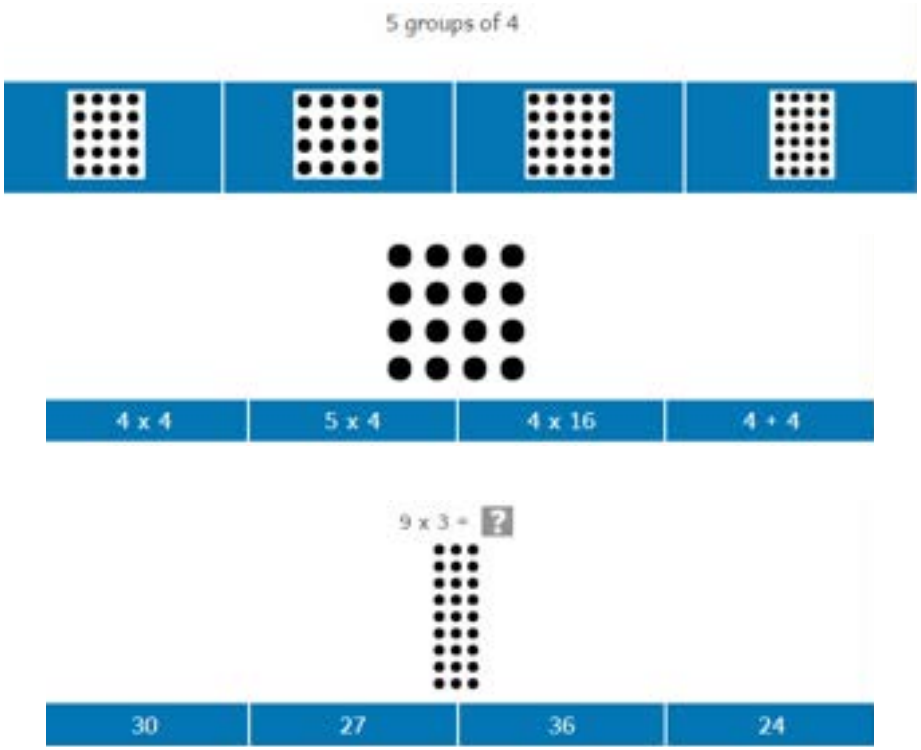
Using our enhanced pupil chooser, you can select which tables you want individual pupils to practise – allowing you to subtly differentiate the learning in a supportive context that doesn't make any pupil feel inferior.

From your pupils' perspective, they are simply playing Sumdog, but you know the specific tables that you have set for each pupil or group.

At Sumdog we continue to give you the tools to increase your pupils' confidence as they build their fluency.

Using our curriculum-aligned Sumdog skills and adaptive learning algorithm, we expand the knowledge gained from arrays and begin to make direct links to multiplication and the mathematical language that has been developed in KS1 as pupils tackle new times tables. Remember, our questions have 100s of iterations, so the potential for practice is enormous!



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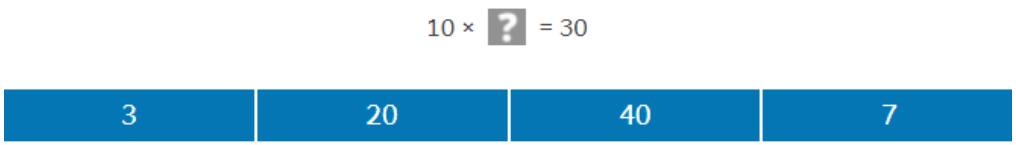
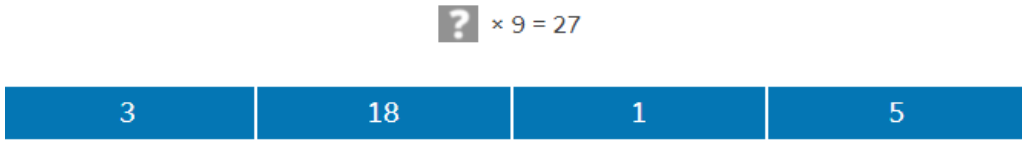
At this stage, the understanding of multiplication as repeated addition is well established through play, enquiry and the concrete and pictorial representations of numbers, and your pupils will be well versed in their 2, 5 and 10 times tables. By the end of year 3, pupils will be expected to know their 3, 4 and 8 times tables and our questions at this level will begin to encourage children to spot patterns and relationships, using questions formats such as missing numbers and abstract representations of questions.





We give plenty of opportunity for children to practise multiplication statements.

3, 6 and 18: 3 x 6 =18, 6 x 3 =18, 18 ÷ 3 = 6, 18 ÷ 6 = 3

This learning begins to build on the commutative foundations from KS1 and introduces the laws of associative and distributive properties.

Commutative – 5 x 28 is the same as 28 x 5 = 140

Associative – (5 x 14) x 2 = 140

Distributive – (20 x 5) + (8 x 5) = 140

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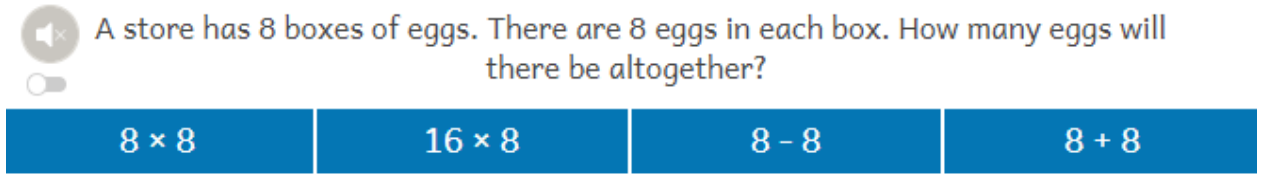
Understanding these properties highlights differing strategies for children to increase their mental agility in answering more complicated multiplication questions, within real-life contexts in particular.



Remember – Sumdog is about more than just memorisation and practice.

We help you to develop your pupils' multiplication fluency and understanding, leading in turn to speed, accuracy and fluency.

The Sumdog MTC, multiplication practice and sample questions are ideal components to incorporate into your lesson planning, classroom environment and home learning opportunities.

Using our platform will support your teaching of multiplication fluency and provide the opportunity for low-stakes practice that is not time-pressured or demotivating.

Beginning to use the Sumdog MTC in Year 3 allows you to gradually familiarise your pupils and prepare them for the statutory test in Year 4 in a supportive way, providing them with the opportunity to apply their knowledge and build their confidence as they enter Year 4.

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Related DfE Links (Statutory and non-statutory)
• Recall multiplication and division facts for times tables up to 12 × 12. • Use place value, known and derived facts to multiply and divide mentally, including multiplying by 0 and 1; dividing by 1; multiplying together 3 numbers. • Recognise and use factor pairs and commutativity in mental calculations. • Multiply two-digit and three-digit numbers by a one-digit number using formal written layout. • Solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by 1 digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects. • Pupils continue to practise recalling and using times tables and related division facts to aid fluency. • Pupils practise mental methods and extend this to 3-digit numbers to derive facts, (for example 600 ÷ 3 = 200 can be derived from 2 x 3 = 6).
YEAR 4 – Sumdog pathway to multiplication success
Key Sumdog Skills: 4.N.MD.1b, 4.N.MD.2, 4.N.MD.4, 4.N.MD,5 As the Sumdog pathway preparing your pupils for the statutory MTC reaches its destination, it is now important that your pupils can recall all their multiplication facts to 12 x 12. For some pupils, we know this can seem a huge milestone but we hope that by following our structured approach the foundations have been laid and that they will be confident in recalling and using their times tables. The combination of the Sumdog MTC and our competitions, challenges, contests and low-stakes tests continues to give you opportunities to direct and focus learning and for the children to continue to build confidence, fluency and recall. When the time comes to administer the statutory MTC from the Department of Education, your children will be well equipped with multiple strategies for tackling times tables, a familiarity with the question format and the online delivery method, and of course the mathematical foundations to build on moving towards Upper Key Stage 2 and the more challenging concepts that they will encounter. At Sumdog, we believe that in order for children to experience continuous development and success in mathematics, the groundwork must be laid from Year 1 onwards and our platform has been designed to help teachers provide this.

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There will of course be pupils at this stage who are still struggling to grasp certain multiplication concepts, and Sumdog can also function as an early intervention solution to get them back on track. We would also recommend that you:

- **Provide pupils the opportunity to build on their confidence with ad-hoc methods of tackling multiplication.**
- **Provide them with plenty of practice in mental multiplication by 1, 2, 5 and 10.**
- **Make explicit the patterns and relationships within multiplication.**

These patterns and relationships can be a massive help to children who are struggling. For example, if a pupil cannot reliably calculate the product of 6 and 8, then start with 6 x 2 = 12 before doubling it to get 6 x 4 = 24 and doubling again to get 6 x 8 = 48.

Similarly, if a pupil cannot remember what 7 x 8 is but they are more comfortable with 6 x 8 = 48, then suggest they work out 7 x 8 by adding on another 8 = 56. Alternatively, they could use 5 x 8 = 40 and 2 x 8 = 16 to deduce that 7 x 8 = 40 + 16 = 56.

By using Sumdog, by Year 4 your pupils will be well acquainted with the commutative, associative and distributive properties which will both support them and encourage them to spot the patterns and relationships within the numbers that lead to faster recall.

When a pupil is struggling, use Sumdog to encourage and motivate them to practise their times tables and use your in-class teaching to highlight the particular areas and strategies you want to focus on. These types of patterns and relationships provide the basis for pupil enquiry-based learning and the development of metacognition.

For example:

- There is no 1 times table to learn as the product is the same as the original number, reducing the number of facts to learn.
- The 10 times table was taught comprehensively at KS1 so most pupils will be able to quickly and easily recall this with the pattern of adding a zero.
- Similarly, the 11 times table builds on the 1 times table and the duplicating of the tens and unit digits means it is one that pupils often find easier.
- The 2 times table is doubling and through the use of concrete materials in KS1 alongside skip-counting methodologies they should be familiar with this.
- Learning times tables in pairs can make it easier for children, particularly if they have the conceptual understanding of commutative laws that Sumdog has been building, e.g. 3 x 7 = 21 and 7 x 3 = 21.
- An understanding of squared numbers can also support pupils, as well as an appreciation of multiplication as repeated addition, e.g. if you know 3 x 8 is 24 then you can work out 3 x 9 is 27.
- The 9 times table has a very distinctive pattern of going up and down.

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- Answers in the 5 times table end in a 5 or a 0.
- Odd factors x odd factors = odd products, odd factors x even factors = even products, even factor x even factor = even product.

The following Year 4 sample questions clearly show the progression within our product as we encourage pupils to make connections to times tables for themselves and build their understanding of patterns and relationships around multiplication facts.

Is the same as?

2 × 3 + 3 × 5	3 × 3 + 3 × 5	5 + 15	2 × 3 + 2 × 5

What is the same as 2 × 4 × 5?

8 × 6	9 × 5	2 × 9	2 × 20

We continue to create real-life connections and scenarios that allow pupils to apply their knowledge of multiplication to familiar contexts, allowing them to see how multiplicative fluency will continue to be a valuable asset.

Sophie earned 9 points per question and answered 4 questions. How many points did she earn altogether?

9 × 36	13 × 4	9 × 4	36 × 4

Make 63:

9 ÷ 8	9 × 7	8 × 7	10 ÷ 7

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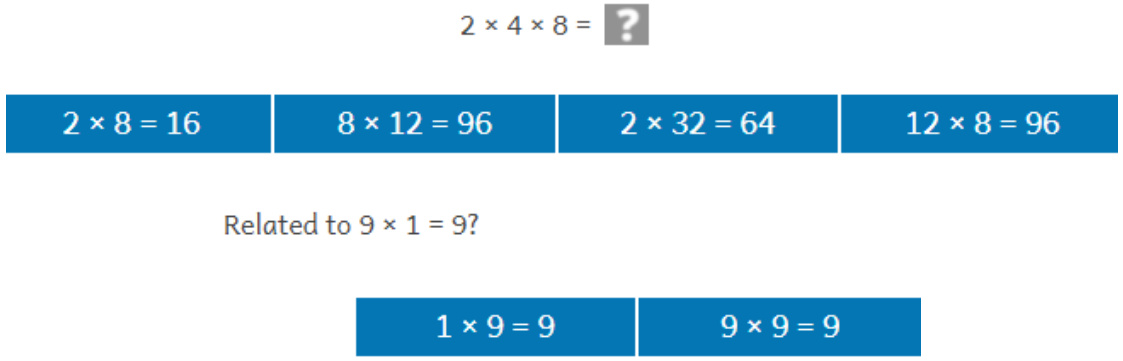
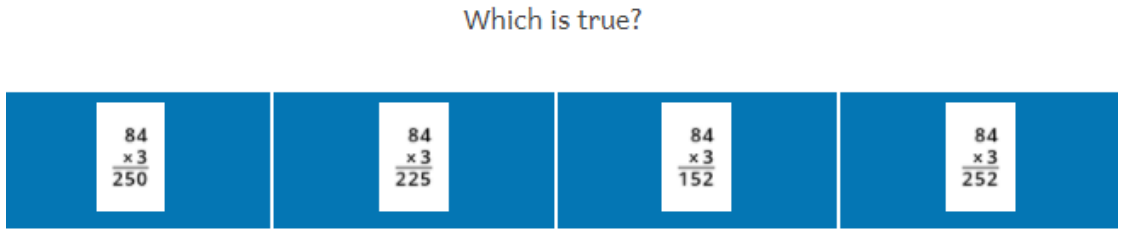


Finally, we make links to the abstract way that children learn to multiply large numbers, using chimney or column sums, in preparation for their journey into the world of long multiplication.



By playing Sumdog from Year 1, your pupils will have experienced 100s of practice questions in a range of formats and styles that build their conceptual understanding of multiplication. However, when preparing specifically for the statutory MTC it is important that they have the opportunity to build their pace and accuracy.

The following page provides teachers with a structured approach to using Sumdog to build automaticity of the multiplication facts within your classroom at Year 4. This plan could be accompanied by in-class times table songs, games and chants and is ideal for use as a home learning plan.

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Year 4 – Building automaticity with Sumdog using the Sumdog MTC

When your pupils select the tables challenge that you have set, they will be presented with it within the familiarity of our engaging and fun games. You will be able to view the results and plan targeted support in your teaching.

Times table challenges can be set for home learning or integrated within the classroom and you can decide how many questions each pupil needs to answer. The plan below is a suggested structured guide, but by using our pupil chooser you can easily differentiate the focus for individuals or groups.

TERM 1	TERM 2	TERM 3
Week 1 – 2 times table	**Week 8 – Sumdog MTC**	**Week 15 – Sumdog MTC**
Week 2 – 4 times table	Week 9 – 8 times table	Week 16 – 3, 4, 5, 6 times tables
Week 3 – 3 times table	Week 10 – 9 times table	**Week 17 – Sumdog MTC**
Week 4 – 6 times table	Week 11 – 3, 4 and 5 times table	Week 18 – 7, 8, 9, 10 times tables
Week 5 – 5 times table	Week 12 – 10 times table	Week 19 – 11 and 12 times tables
Week 6 – 7 times table	**Week 13 – Sumdog MTC**	Week 20 – 3, 4, 5, 6, 7, 8 times tables
Week 7 – 6 and 7 times table	Week 14 – 11 and 12 times tables	Week 21 – 9, 10, 11, 12 times tables

Our Assessment Library also contains a range of pre-made tests for all year groups on curriculum-aligned topics such as 'Multiplication and Division', and can be used to accurately assess pupils' conceptual understanding and ability to apply their knowledge in a range of contexts.*

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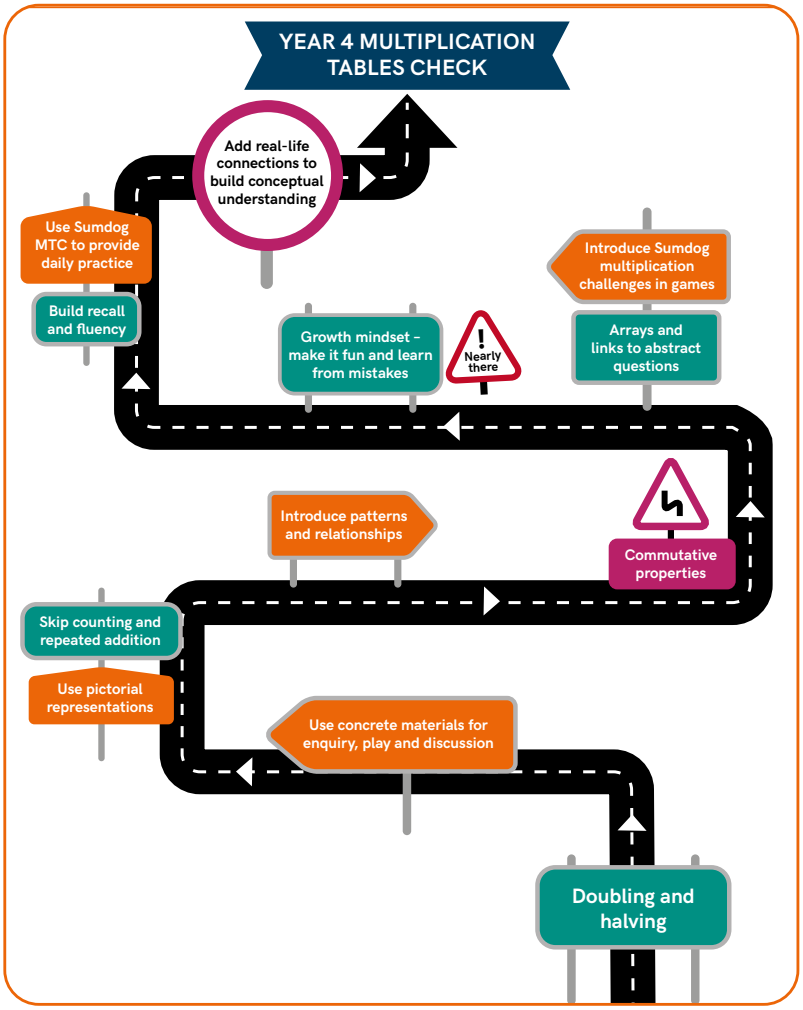
Why should you follow the Sumdog Pathway to the MTC?

+ Your pupils will engage in a developed, structured pedagogy with the aim of **learning** multiplication facts, not memorising.
+ Sumdog **complements** your everyday teaching, it **supplements** your planning and existing schemes of work, and it provides easy home learning links.
+ Our **progressive algorithm** introduces concepts to pupils in full alignment to the National Curriculum. We **build conceptual understanding and encourage metacognition** in learning.
+ Our **fun and engaging games**, challenges, competitions and contests provide pupils with many opportunities to apply their knowledge and **learn from their mistakes**.
+ Our platform encourages a **growth mindset**, rewarding pupils for their effort with coins that can be spent in the Sumdog house and garden.
+ Our **pre-made tests** and reporting provide teachers with the tools they need to direct learning. You can also create your own custom tests and easily and **subtly differentiate** to ensure everyone in your class experiences success.



Sumdog MTC

The Sumdog Multiplication Table Check is the perfect way to build your pupils' confidence, replicating the statutory assessment on a platform they know and love. The included heat map report provides you with insight into the tables to focus on and the tool creates a seamless, stress-free transition to the statutory MTC at the end of year 4.

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Beyond Year 4

Although the Sumdog Pathway to Multiplication Success does not continue past the MTC, it's important to remember that Sumdog can continue to build your pupils' mathematical fluency and conceptual understanding far beyond Year 4!

Our adaptive practice, challenges and low-stakes tests will continue to build pupils' knowledge progressively throughout **KS2 and KS3** using our wide range of National Curriculum aligned question content.

You can continue to develop and improve your pupils' multiplicative fluency beyond Year 4 by setting focus on multiplication and tracking improvement in attainment through the reporting, insights and heat maps that Sumdog provides.

Which is a factor of 30?

18	12	9	3

949 × 8 is about how much?

About 900 × 8	About 9 × 8	About 1,000 × 10	About 90 × 80

In Upper KS2 and KS3, we extend and challenge pupils' understanding of the number system, developing the connection of multiplication to division and encouraging pupils to apply the multiplication recall they have developed to fractions, decimals, algebra and more complex word problems.

Adam has 4 boxes of books with 25 books in each box. He wants to put the same number of books on each shelf of a bookshelf with 8 shelves, with the remainder going to his library. How many go on each shelf and how many go to the library?

4 × 29 ÷ 8	4 - 25 ÷ 8	29 × 25 ÷ 8	4 × 25 ÷ 8

To see a full breakdown of our National Curriculum aligned content, download our scheme of learning here.

Sample Lesson Plan: Introducing Arrays (Year 2)

Aim:	Success Criteria:	Resources:
Understand that multiplication is **commutative** e.g., 4 × 3 = 3 × 4 I am learning to solve problems using arrays.	I can recognise patterns in an array.	Ten frame, dinosaurs/cubes/ toys. **Sumdog**
	Key/New Words: Commutative, sets, groups, sharing, equally, between.	**Preparation:** Differentiated Sumdog challenges as required. Selected Sumdog sample pictorial questions.

Prior Learning: Pupils will be familiar with counting to 20, backwards and forwards and will have started learning doubling and halving.

Learning Sequence

Starter	Pupils choose toys across the classroom and are asked to put them into a ten frame. Pupils create their own arrays and count how many they have. Using **Sumdog sample** questions pictorial representations of arrays are shown, with pupils counting columns and rows.
Main Activity	Key questions are posed as pupils develop their metacognition and understanding. Are 2 lots of 5 dinosaurs the same as 5 lots of 2 dinosaurs? You have 6 rows of 2 cubes, how many do you have altogether? The differentiated Sumdog challenge can then take place using **Sumdog skill 2.n.md.4.**
Plenary	**Sumdog** custom test set to formatively assess understanding of content and inform next teaching. Pupils are encouraged to plant an array in the **Sumdog** garden of plants as a home learning challenge.

Sample Lesson Plan: Building Multiplication Fluency (Year 4)

<table>
<tr><td rowspan="2">Aim:

To answer multiplication facts within 6 seconds in preparation for MTC.

I can answer multiplication facts fluently.</td><td>Success Criteria

I can answer multiplication questions within 6 seconds.</td><td>Resources:

Sumdog

Whiteboards</td></tr>
<tr><td>Key/New Words:

Multiplication, fluency, accuracy, efficiency, agility.</td><td>Preparation:

Differentiated Sumdog multiplication focus as appropriate.

Sumdog MTC practice.</td></tr>
</table>

Prior Learning: Pupils have a solid foundation of conceptual understanding of multiplication, including commutative, associative and distributive properties.

Learning Sequence

<table>
<tr><td>Starter</td><td>Pupils start with a quick-fire multiplication practice on Sumdog. The teacher will have differentiated this as appropriate.</td></tr>
<tr><td>Main Activity</td><td>Teacher places a Sumdog abstract multiplication on the screen and pupils quickly write their answer on whiteboards, using a show me activity.

Building on metacognition and mental agility, pupils discuss some of the commutative, associative and distributive properties of multiplication and the strategies they used to solve, including the patterns and relationships. This uses Sumdog skill: 4.N.MD.3.

Pupils then take part in the MTC practice session on Sumdog.

</td></tr>
<tr><td>Plenary</td><td>Pupils finish with a game of Sumdog multiplication bingo, pupils write down numbers 1–144. The teachers read out a multiplication sum and the pupils score out the product.

The winner receives 50 Sumdog coins awarded by their teacher.</td></tr>
</table>

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Using the Sumdog MTC Heat Map

The Sumdog heat map will provide the average accuracy, speed and fluency of your pupils, weighted towards the most recent answers, and using our differentiated pupil chooser you can then make sure that your pupils are focusing on the tables relevant to them.

- Teachers can use the **heat map to quickly identify** which tables their class need to practise more.
- Ability to change the **reporting metric** between **accuracy**, **speed** and **fluency.**
- Helps to **improve automaticity** by focusing pupil practice on tables questions.

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Contact us today to start your pupils on their pathway to multiplication success.

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