

Multiplication Tables Check

Policy and Guidance for Learning Multiplication Facts

Intent

Children should be able to recall multiplication facts fluently. This ability will increase their confidence in mathematics and will improve their ability to solve problems and reason about mathematical concepts connected to multiplication knowledge.

Pupils are first introduced to the concept of multiplication in Year 1 when they begin counting in 2, 5 and 10.

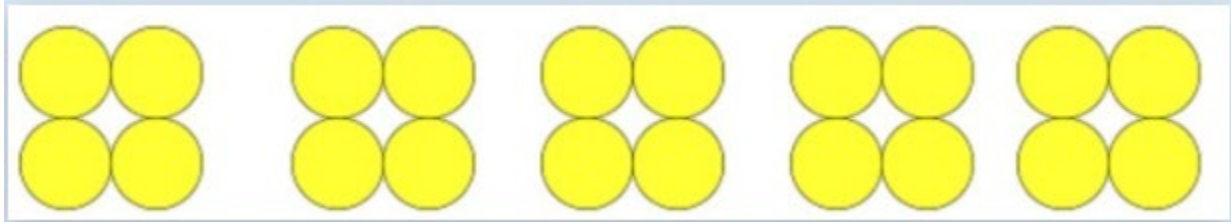
Pupils are introduced to multiplication tables in Year 2 and practise to become fluent in the 2, 5 and 10 multiplication tables.

By the end of Year 3, pupils should be able to fluently recall the 2, 3, 5, 10 multiplication tables.

By the end of Year 4, pupils should be able to fluently recall all tables from 1 to 12. This ability is checked each year by the online Multiplication Tables Check which is administered in the summer term.

Implementation

Multiplication should be taught using a concrete, pictorial, abstract approach, with all children accessing the learning in all modes. When teaching a new times table, students may need to keep a 1:1 correspondence with concrete objects, such as below for the 4 times table:



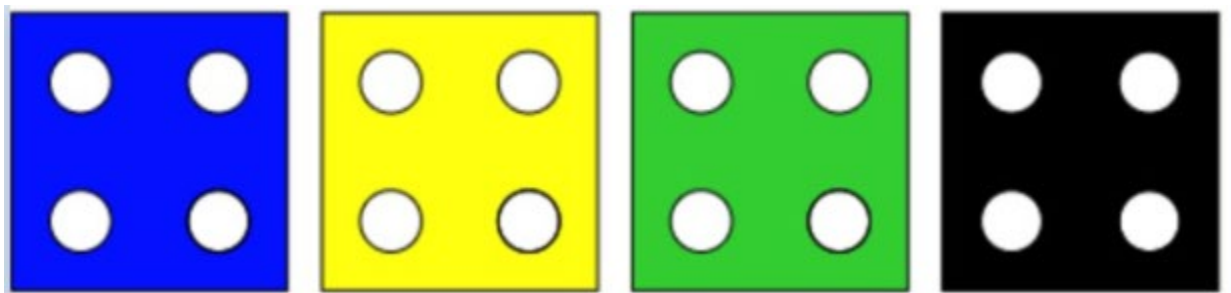
We want children to move on from 1:1 correspondence quickly so that they are able to see each group as a set of four. This allows for counting in groups of 4. Songs and chanting can be used to reinforce the pattern of the 4 times table.

Children should be exposed to as many different concrete and pictorial representations of 4 to build understanding. Below are some examples:

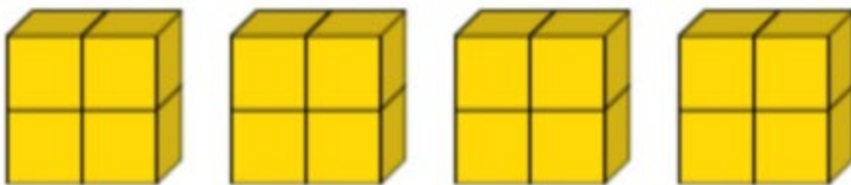


Unifix cubes

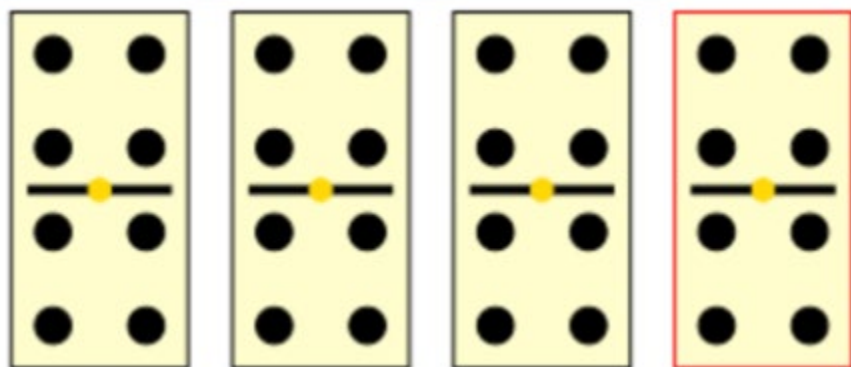
Die



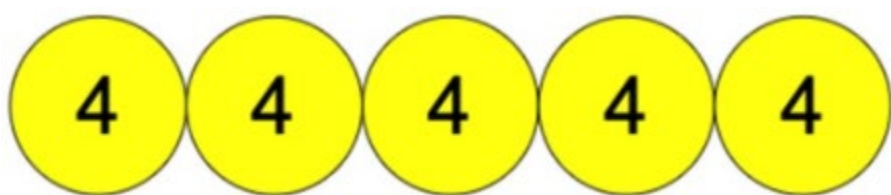
Dienes blocks



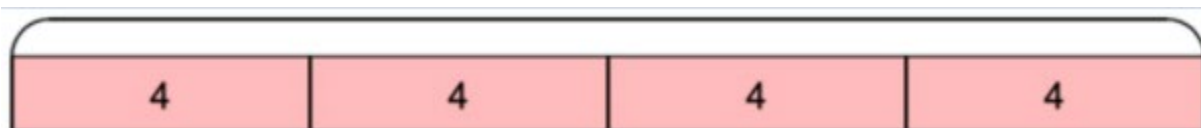
Dominoes



Number counters



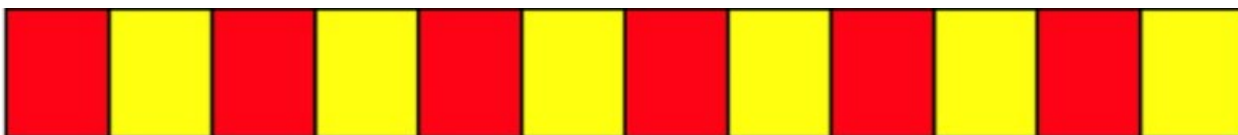
Bar model



Cuisenaire rods



Counting stick



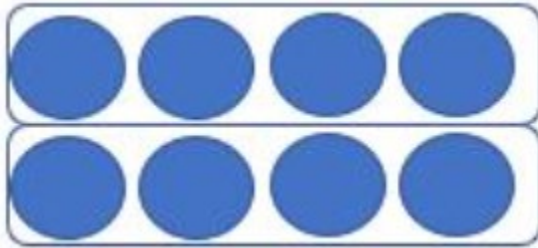
Students should draw on their knowledge of the concrete representations to aid understanding of pictorial representations. They should use their knowledge of repeated addition and the commutative law in tasks such as this:



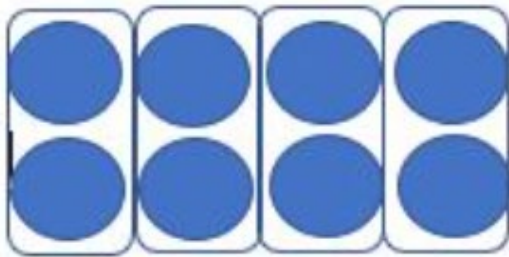
$$4 + _ + _ = _$$

$$3 \times _ = _$$

Once confident with this, pupils can then move onto arrays, where the commutative law is reinforced further:

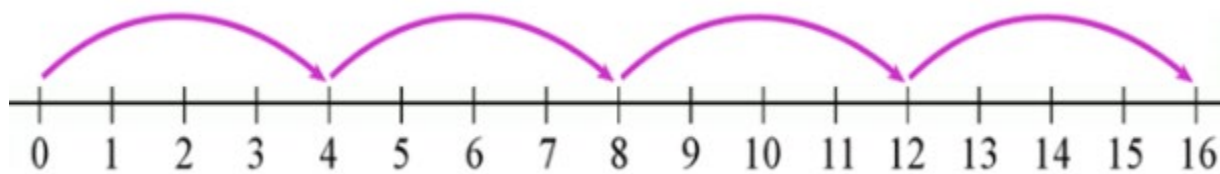


$$2 \times 4 = 8$$



$$4 \times 2 = 8$$

Finally, pupils can move onto an abstract approach. This would look like jumping on a number line at first before moving onto calculations without the scaffold.



Routines for attaining fluency in multiplication

We help children to learn and practise their multiplication tables in the following ways:

Year 1:

- Children are taught to count in groups of 2, 5 and 10

Year 2:

- Daily multiplication tables practice (after introduction of multiplication tables in Spring Term)
- Times Table Rock Stars accessed in school (after introduction of multiplication tables in Spring Term)

Year 3:

- Daily multiplication tables practice (see next section)
- Times Table Rock Stars accessed weekly in school
- Times Table Rock Stars set as home learning

Year 4:

- Daily multiplication tables practice (see next section)
- Times Table Rock Stars accessed twice weekly in school
- Times Table Rock Stars set as home learning
- Assessment of MTC-readiness using Soundcheck mode on TTRS each term during Assessment Week
- Entry in TTRS OUMTC check twice annually to raise profile amongst parents and children

Year 5:

- Daily multiplication tables practice (see next section)
- Times Table Rock Stars accessed weekly in school
- Times Table Rock Stars set as home learning

Year 6:

- Daily multiplication tables practice (see next section)
- Times Table Rock Stars accessed weekly in school
- Times Table Rock Stars set as home learning

Daily Multiplication Tables Practice in Key Stage 2

The following routine should be followed daily for all children in Key Stage 2 to help develop automaticity in times tables.

1. FunKey maths step counting slides used by class teacher to rehearse the times table being learnt. For a model, this video on Youtube provides a good example of what this might look like:
<https://www.youtube.com/watch?v=yXdHGBfoqfw>
 - a. As the class become more confident with the target timetable, start chanting in multiples of 10/100/0.1 to develop greater depth fluency
2. Children to complete a set of questions on the multiplication table being learnt, including inverse facts. These questions are taken from Ashley Down school and the booklets are on Sharepoint. Each child should have their own copy of the booklet and complete one set of questions each day.
3. Call and repeat the answers with the whole class and pupils self-mark. It is important that this is done using the following rules:
 - a. **Shortest form** (five twos are ten; seven eights are sixty four). Always use that same format.
 - b. **Biggest factor first** (always give the soundbite with the largest factor first). Therefore, if the question asks $5 \times 8 = \underline{\quad}$, you call out 'eight fives are 40'. This way, there is only one soundbite for a family of facts.
 - c. **Rephrase division as multiplication**. As above, we want all facts in a fact family to be learnt as one soundbite. Therefore, $\underline{\quad} \div 4 = 8$ would be chanted as 'eight fours are 32' and then fill in 32 on the IWB for children to mark.
4. Note which children are struggling with this timetable (<36/40). These children should be sent with an adult to practice using flashcards for five minutes daily as further practice.
5. Notice which timetable these children are struggling with and turn it into a door code: print the fact (without the answer) and pin to your door. Every time the class enter and leave the room, ask these children for that particular fact including the answer.
6. Once per week, use the Derived Fact sheets to further develop greater depth fluency. Children should complete the fact family triangle at the top before answering as many questions as possible in three minutes.

National Curriculum Statutory Requirements

Year 1:

Pupils should be taught to:

- 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.

Year 2:

Pupils should be taught to:

- recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
- calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication ($\times$), division ($\div$) and equals (=) signs
- show that multiplication of two numbers can be done in any order (commutative) and division of one 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.

Year 3:

Pupils should be taught to:

- recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables
- write and calculate mathematical statements for multiplication and division using the multiplication 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.

Year 4:

Pupils should be taught to:

- recall multiplication and division facts for multiplication 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 three 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 one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.

Year 5:

Pupils should be taught to:

- identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers
- know and use the vocabulary of prime numbers, prime factors and composite (nonprime) numbers
- establish whether a number up to 100 is prime and recall prime numbers up to 19
- multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers
- multiply and divide numbers mentally drawing upon known facts
- divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context
- multiply and divide whole numbers and those involving decimals by 10, 100 and 1000
- Mathematics – key stages 1 and 2 33 Statutory requirements
- recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)
- solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes
- solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign
- solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.

Year 6:

Pupils should be taught to:

- multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
- 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
- perform mental calculations, including with mixed operations and large numbers
- solve problems involving addition, subtraction, multiplication and division