MULTIPLICATION AND DIVISION GUIDELINES

Overview

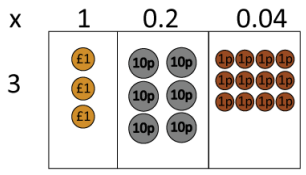
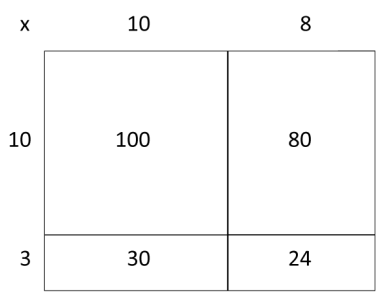
1. The aim of these guidelines, in line with the new National Curriculum, is not to race to the end but to secure understanding at each stage.
2. Children need to be able to explain the methods in terms of how and why not just what to do.
3. The written method is the way to record what we do with equipment. Children need to manipulate objects, draw images or use concrete representation before moving to abstract concepts. The imagery will stay in the pupils' heads, it's not just something to do during the first stages of learning a method.
4. Each time a new stage is introduced children should compared it to the stage before and identify similarities, rather than just ignore or move on from what has proceeded it.

Can I do it in my head? • Can I use jottings? • Can I use some equipment? • Can I use a written method?

Common language / MMMS (All language is to be used interchangeably)

- maths story, number sentence, calculation as opposed to the real life story
- get ready to get some more, addition, add (with physical action)
- get ready to take some away, subtraction, take away (with physical action)
- same value, different appearance, equals (with physical action)
- I love what you are doing, do it lots of times, multiply (with physical action)
- think about piles/groups, division, sharing, grouping (with physical action)

Teaching multiplication

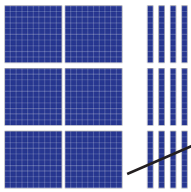
Step	Model and image
Step 7 – Multiplying decimals Grid method for the multiplication of decimals, modelled initially with coins (Approximation required first eg. 3 x 1.24 is approximately 3 x 1 = 3)	 x | 1 | .2 | .04 3 | 3 | .6 | .12 Decimal point – point tells you to think about tenths. Tenths tell you to think about hundredths.
Prerequisites: as below, understanding of 2 decimal places	
Step 6 Expanded long multiplication (long multiplication as multiplying by a 2 digit number) Arrays on squared paper leading to the grid method Grid method leading to long multiplication May lead most able to concise long multiplication. Assertive Mentoring prompt L5/8	 1 8 x 1 3 2 4 3 0 8 0 1 0 0 2 3 4 1 8 x 1 3 5 4 1 8 0 2 3 4
Prerequisites: Times table knowledge, ability to partition, column addition, place value	

10 x 8 is 1 x 8 x 1~ty (1 ten) which is 8 ~ty (tens). How do we say this in English 80.

Step 5 Expanded short multiplication, short multiplication

Grid method leading to expanded short multiplication, which leads to short multiplication.
Short multiplication as multiplying by a 1 digit number.
Jot the ~ty and hundred in the written method as shown in the example on the right.
Assertive Mentoring prompt 3/13 and 4/12
Starts with 2 digit by 1 digit (3 digit example below).

x	100	20	7
6	600	120	42



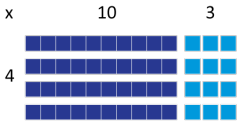
1	2	7
	x	6
4	2	
1	2	0
6	0	0
7	6	2

1	2	7
	x	6
7	6	2

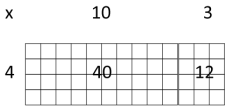
Prerequisites: Times table knowledge, ability to partition, column addition, place value

Step 4 Arrays leading to grid method

Use base 10 equipment/multi-link to model arrays leading to grid method (inc. column addition stage at end of multiplication).
Squared paper (and wrapping paper) can also model arrays and grid method.
Assertive Mentoring prompt 3/13



or



13 x 4 = 40 + 12 = 52

use ~ty and tens
use units, cups and ones

Prerequisites: Times table knowledge, ability to partition, column addition, place value

Step 3 Arrays

Introduce arrays (pictures, counters, jottings) leading to development of times tables and written maths stories.
Commutivity (order of numbers does not change the result in multiplication (and addition)).
Children start to recognise inverse division facts. as arrays lead to objects being grouped

3 x 2 = 6

2 x 3 = 6

6 ÷ 2 = 3

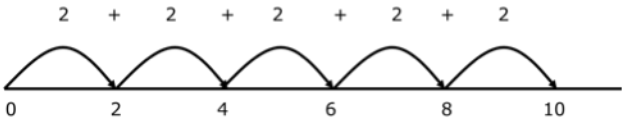
6 ÷ 3 = 2

6 x 20 = 6 x 2 x 10 or 6 x 2 x 1~ty = 12 ~ty
or in English 120.

Prerequisites: Basic counting, ability to make patterns with objects

Step 2 Repeated addition

Children understand multiplication as 'lots of' and solve problems using grouping
'We love what you are doing so do it lots of times'. Physical sign of arms across chest
Assertive Mentoring prompt L2/10.



Number of legs

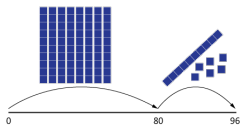
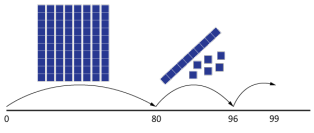
2 + 2 + 2 = 6
2 x 3 = 6

Prerequisites: Basic counting, use of a number line, ability to make patterns with objects

Step 1 Groups of objects
Use objects to make groups (e.g. pairs of socks, five fingers)

Prerequisites: Basic counting

Teaching division

Step	Model and image
Step 6 Long division using knowledge of chunking Model on a number line using key facts	Key facts of 15: 1 x 15; 2 x 30; 4 x 60; 10 x 150; 5 x 75 432 ÷ 15 becomes 2 8 1 5 | 4 3 2 3 0 0 (1 5 x 2 0) 1 3 2 1 2 0 (1 5 x 8) 1 2 answer 28 remainder 12 or 28.8
Prerequisites: take away is finding the difference, ways to represent remainders as parts of a whole group	
Stage 5 Short division from chunking with base 10 (dividing by a 1 digit, if 2 digit then chunk) Children understand short division using base 10	Key facts of 6: 1 x 6; 2 x 12; 4 x 24; 10 x 60; 5 x 30 1 4 6 | 8 ^{2}4 1 0 + 4 6 | 8 0 + ^{2}4 How many groups of 10 can you make?
Prerequisites: take away is finding the difference, column subtraction	
Step 4 Showing chunking on a number line along side long division Model on a number line Can be used to show remainders Show along side long division	96 ÷ 8 =  8 | 9 6 8 0 (1 0 x 8) 1 6 1 6 (2 x 8) 0 Key facts of 8: 1 x 8; 2 x 16; 4 x 32; 10 x 80; 5 x 40 Number lines can also be used to show remainders 
Prerequisites: take away is finding the difference, exchange	

Stage 3 Chunk on a number line

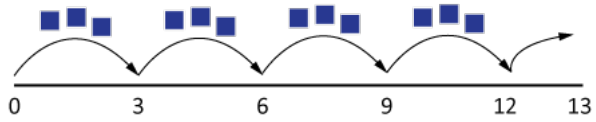
Use known facts to group and chunk on a number line

Create a list of key table facts for the divisor

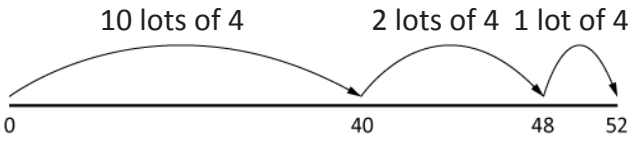
Key facts of 4	
1 x	4
2 x	8
4 x	16
10 x	40
5 x	20

Repeated addition

13 ÷ 3 =

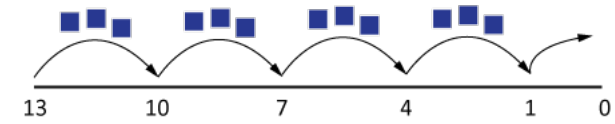


52 ÷ 4 =

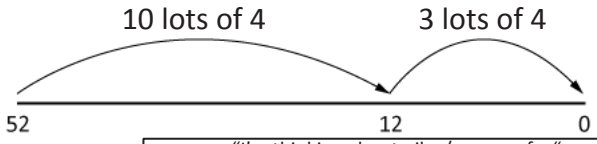


Repeated subtraction

13 ÷ 3 =



52 ÷ 4 =

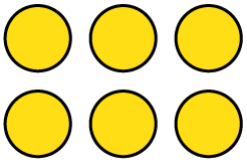


"I'm thinking about piles/groups of… "
(Scratching head or chin) "That's a pile/group of… cups"

Prerequisites: times tables, finding the difference (counting on)

Stage 2 Find groups using arrays

Find groups using arrays.(objects, bead strings)
Highlights links to times tables



6 ÷ 3 =

6 ÷ 2 =

→ Draw circles around objects

Prerequisites: basic counting, ability to make patterns with objects

Stage 1 Group objects and share objects

Use practical equipment

sharing grouping

Prerequisites: counting