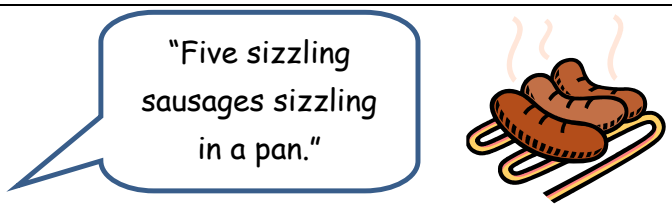
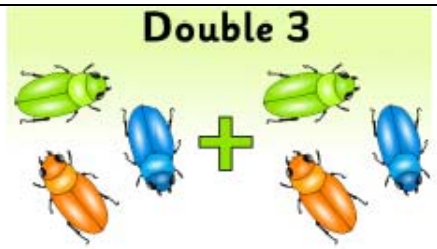
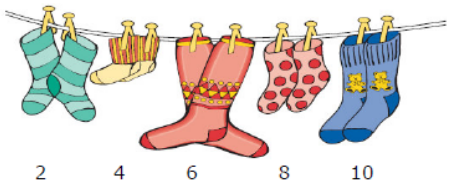
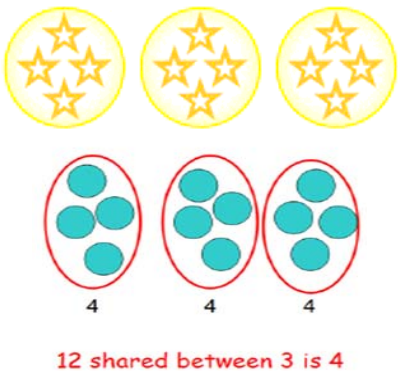
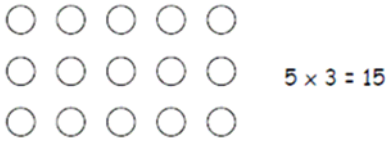
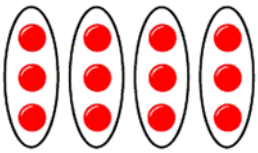
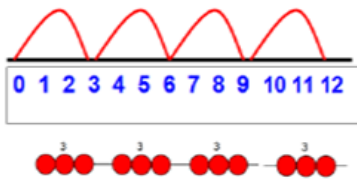
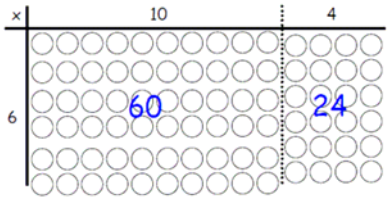
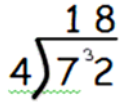
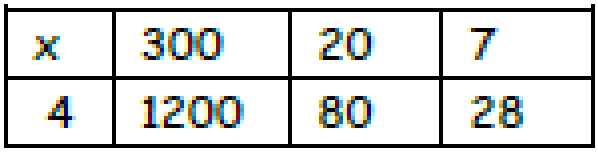
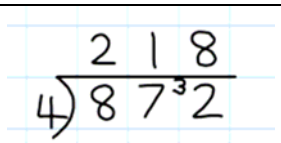
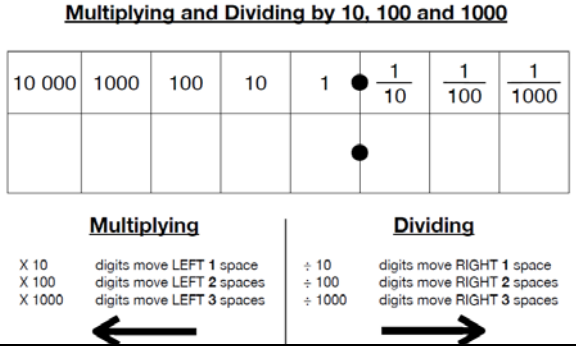
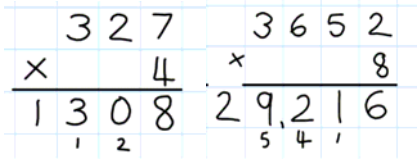
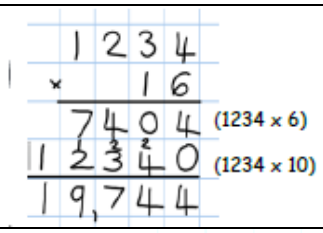
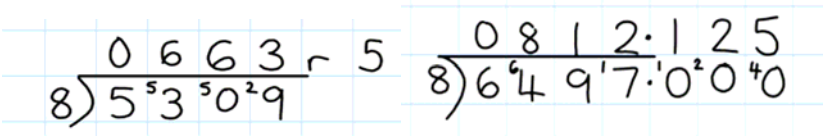
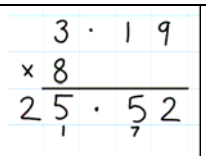
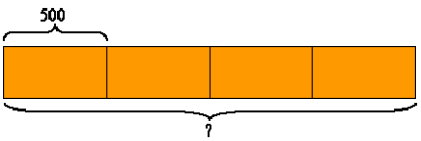
Calculation Policy: Multiplication and Division

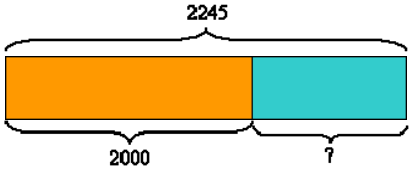
Number	Assessment Point	Example
1	Count forwards and backwards using rhymes and stories.	
2	Count on and back in ones from any given number.	10, 9, 8, 7, 6 …
3	Count on and back in 2's, 5's and 10's.	2, 4, 6, 8, 10…
3.1	Use a real life context to double, halve and share.	
4	Begin to relate multiplication to getting bigger and division to getting smaller.	
5	Begin to count into equal groups of 2, 5 or 10 using objects or pictures.	
5.1	Begin to multiply and divide with concrete objects, arrays and pictures.	How many groups of 4 can be made with 12 stars? **= 3** 

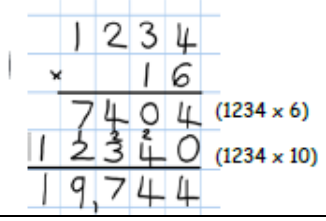
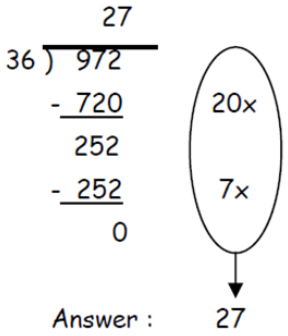
6	Know that you can multiply numbers in any order but you have to divide numbers in order.	$8 \div 2 = 4$ ✓ $2 \div \mathbf{8} = 4$ X $\mathbf{5 \times 3} = 3 + 3 + 3 + 3 = \mathbf{15}$ $\mathbf{3 \times 5} = 5 + 5 + 5 = \mathbf{15}$
6.1	Know multiplication and division facts for 2's, 5's and 10's.	$7 \times 5 = 35$ $5 \times 7 = 35$ $35 \div 5 = 7$ $35 \div 7 = 5$
6.2	Multiply and divide using objects, arrays, diagrams, pictures, repeated addition and grouping using a number line.	 5 x 3 = 15 3 x 5 = 15 **4 X 5 =...**  **4 X 5 = 20**  12 ÷ 3 = 4  **12 ÷ 3 = 4**
6.3	Begin to solve simple word problems.	There are 6 pupils on this table and there are 18 pieces of fruit to share between us. If we share them equally, how many will we each get?

		There are 6 sweets, how many people can have 2 sweets each? 
7	Use and understand the symbols x and ÷	**Key vocabulary multiplication:** groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated ad-dition, column, row, commutative, sets of, equal groups, times, _times as big as, once, twice, three times..., partition, grid method, multiple, product, tens, units, value **Key Vocabulary division:** share, share equally, one each, two each…, group, equal groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over, inverse, short division, carry', remainder, multiple
7.1	Know multiplication and division facts for 3's, 4's and 8's.	8 × 5 = 40 5 × 8 = 40 40 ÷ 8 = 5 40 ÷ 5 = 8
7.2	Multiply a 2-digit number by a single digit number by partitioning the numbers into tens and units within a grid.	 Eg. 23 x 8 = 184 | X | 20 | 3 | | 8 | 160 | 24 | **160 + 24 = 184**
7.3	Divide 2-digit numbers by a single digit number by using the short division method.	
8	Use multiplication and division to solve problems including missing numbers and scaling.	_ x 5 = 20, 3 x __ = 18, __ x __ = 32
9	Use factor pairs and the commutative law mentally.	4 x 12 x 5 = 4 x 5 x 12 = 20 x 12 = 240 4 x 3 = 12 3 x 4 = 12

9.1	Know multiplication and division facts up to 12x12.	
9.2	Use the distributive law in mental calculations.	39x7 = 30 x 7 + 9 x 7.
9.3	Use approximating and rounding to check answers.	**346 x 9** is approximately 350 x 10 = **3500**
9.4	Multiply a 2-digit and 3-digit numbers by a single digit number by partitioning the numbers into hundreds, tens and units within a grid.	327 x 4 =  1200 + 80 + 28 = 1308
9.5	Divide 3-digit numbers by a single digit number by using the short division method.	
9.6	Use place value and known facts to multiply and divide mentally by 10 and 100.	
9.7	Use multiplication and division to solve one-step worded problems in context.	Albert has 35 oranges stored in boxes. If there are 7 boxes, how many oranges must go in each box?
10	Identify	The factors of 24 are 1, 2, 3, 4, 6, 8, 12 and 24 because

	multiples and factors, including factor pairs and common factors of two numbers.	24 divides by 1, 2, 3, 4, 6, 8, 12 and 24 1 and 24 are a factor pair of 24 since 1 x 24 = 24 2 and 12 are a factor pair of 24 since 2 x 12 = 24 3 and 8 are a factor pair of 24 since 3 x 8 = 24 4 and 6 are a factor pair of 24 since 4 x 6 = 24
10.1	Multiply a 4-digit by a 1 digit number using short multiplication.	
10.2	Multiply a 3-digit or 4-digit by a 2 digit number using long multiplication.	
10.3	Divide 4-digit numbers by a single digit number by using the short division method.	
10.4	Multiply and divide decimals with units.	 $\underline{1.3}$ $7\overline{)9.1}$
10.4	Use multiplication and division to solve two-step worded problems in context.	Betty needs 2245g of sugar to bake some cookies. She has 4 packets of sugar. The mass of each packet of sugar is 500g. How much more sugar does she need? ***Solution:*** **Step 1:** Find the total mass of the 4 packets of sugar.  500 × 4 = 2000 **Step 2:** Find how much more sugar she needs.

		 2245 – 2000 = 245 She needs 245g more sugar.
10.5	Use place value and known facts to multiply and divide mentally by 10, 100 and 1000 to make a decimal.	**Multiplying by 10** When you multiply a decimal number by 10 you move all the digits **one place to the left**. The number becomes **10 times bigger**. **Example:** 2.63 × 10 = 26.3 You can see from the answer that the digits move to the left - units move to tens and the others follow like this: H = hundreds T = tens U = units **Multiplying by 100** When you multiply a decimal number by 100 you move all the digits **two places to the left**. The number becomes **100 times bigger**. **Example:** 2.63 × 100 = 263 Th = thousands H = hundreds T = tens U = units **Multiplying by 1,000** When you multiply a decimal number by 1,000 you move all the digits **three places to the left**. The number becomes **1,000 times bigger**. **Example:** 2.63 × 1,000 = 2,630 TTh = tens of thousands Th = thousands H = hundreds T = tens U = units
10.6	Recognise squared, cubed, and roots.	$1^2 = 1 \times 1 = 1$ $2^2 = 2 \times 2 = 4$ $3^2 = 3 \times 3 = 9$ $\sqrt{4}$ = 2 or -2. And $\sqrt{25}$ = 5 or -5. $1^3 = 1 \times 1 \times 1 = 1$ $2^3 = 2 \times 2 \times 2 = 8$ $3^3 = 3 \times 3 \times 3 = 27$ $\sqrt[3]{8}$ is 2 and $\sqrt[3]{27}$ is 3.
11	Identify common factors, common multiples and prime numbers.	24 = 1 x 24 = 2 x 12 = 3 x 8 = 4 x 6 So the factors of 24 are 1, 2, 3, 4, 6, 8, 12 and 24. The multiples of 2 are 2, 4, 6, 8, 10, 12, 14, 16… Is 8 a Prime Number? **No**, because it can be divided evenly by 2 or 4 (2×4=8), as well as by 1 and 8. Is 73 a Prime Number? **Yes**, it can **only** be divided evenly by 1 and 73.

12	Perform mental calculation including mixed operations (including using the inverse) and large numbers.	I think of a number. I add 12, subtract 7.2 and multiply by 3. My answer was 120. What is my number? (120 ÷ 3 + 7.2 -12 = 35.2)
13	Multiply a 4-digit by a 2-digit number using long multiplication.	
13.1	Divide 3-digit or 4-digit numbers by a 2-digit number by using long division by chunking.	
13.2	Multiply a decimal by a decimal.	37.7 x 2.8 = ? ---> 37.7 (1 decimal place) x 2.8 (1 decimal place) 3016 +754 (2 decimal places, move point 2 places left) 105.56 *Original:* 0.03 × 1.1 → *1 Move:* **0.3** × 1.1 → *2 Moves:* **3.0** × 1.1 → *3 Moves:* **3.0** × **11.** Then we do the (now easy) multiplication: 3.0 × 11.0 = 33. But remember, we did 3 Moves of the decimal point, so we need to undo that: *3 Moves:* **33.0** → *2 Moves:* **3.3** → *1 Move:* **0.33** → *Correct* **0.033**
13.3	Interpret remainders as whole	125 ÷ 4 = 31 remainder 1. Or… 31 remainder 1/4 (0.25)

<table>
<tr><td></td><td>whole numbers, fractions or by rounding.</td><td>Or… 31.25</td></tr>
<tr><td>13.4</td><td>Use BODMAS</td><td>
B Brackets first
O Orders (ie Powers and Square Roots, etc.)
DM Division and Multiplication (left-to-right)
AS Addition and Subtraction (left-to-right)
<table>
<tr><td>Brackets</td><td>6 × (5 + 3) = 6 × 8 = 48</td></tr>
<tr><td>Orders</td><td>5 × 22 = 5 × 4 = 20</td></tr>
<tr><td>Division
Multiplication</td><td>30 ÷ 5 × 3 = 6 × 3 = 18</td></tr>
<tr><td>Addition
Subtraction</td><td>2 + 5 × 3 = 2 + 15 = 17</td></tr>
</table>
</td></tr>
<tr><td>14</td><td>Multiply two negative numbers together.</td><td>minus × minus (two negatives make a positive):

(−3) × (−2) = 6</td></tr>
<tr><td>14.1</td><td>Divide a decimal by a decimal.</td><td>Divide 6.4 by 0.4

6.4÷0.4 is exactly the same as 64÷4, just multiply both by 10!

64 ÷ 4 = 16 so 6.4 ÷ 0.4 = 16</td></tr>
</table>