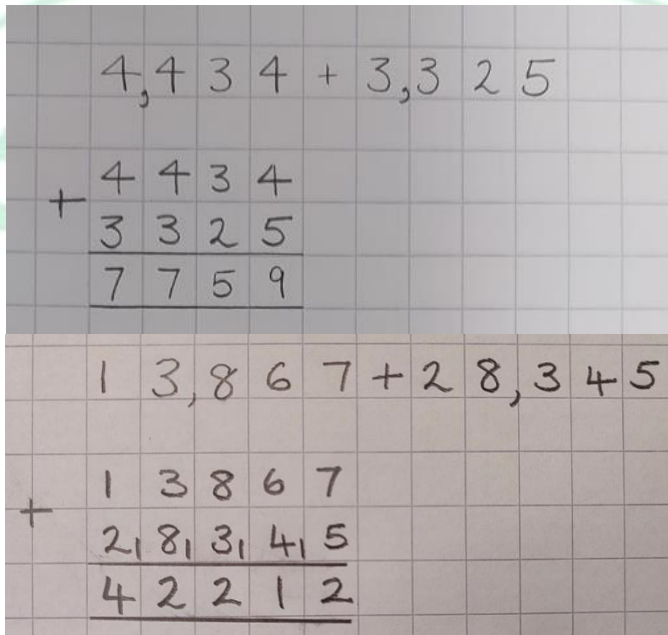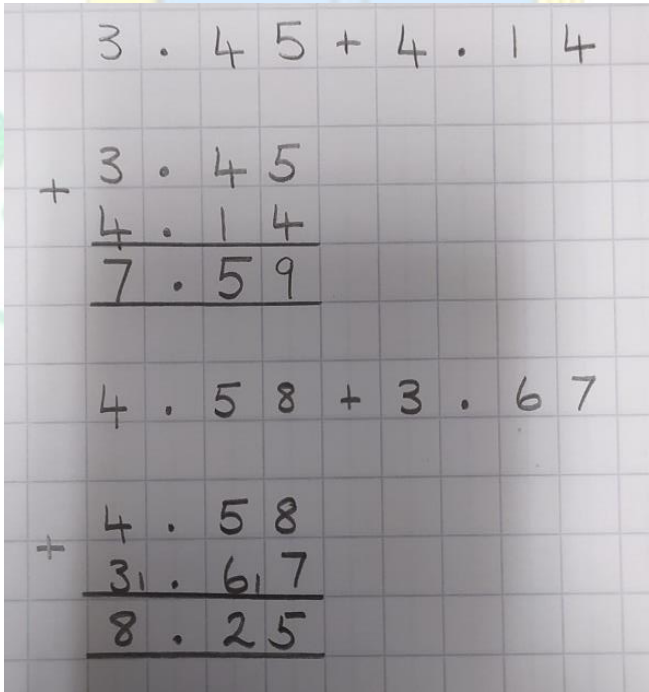# Year 5 Addition Progression Grid
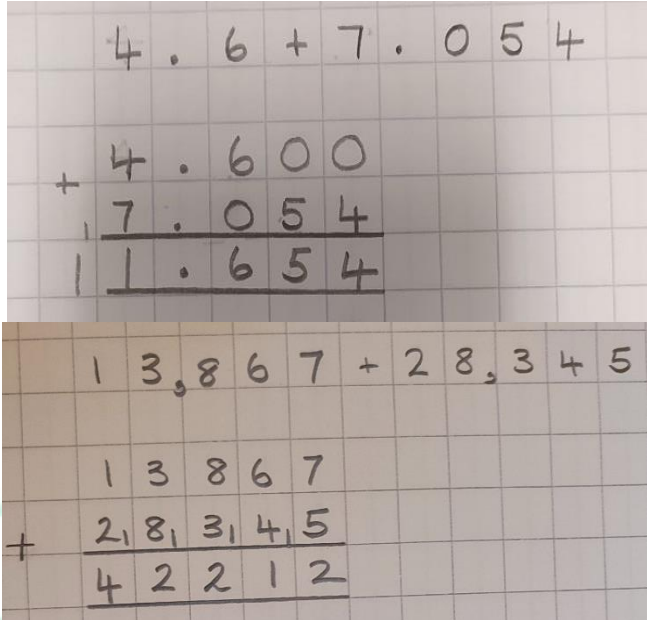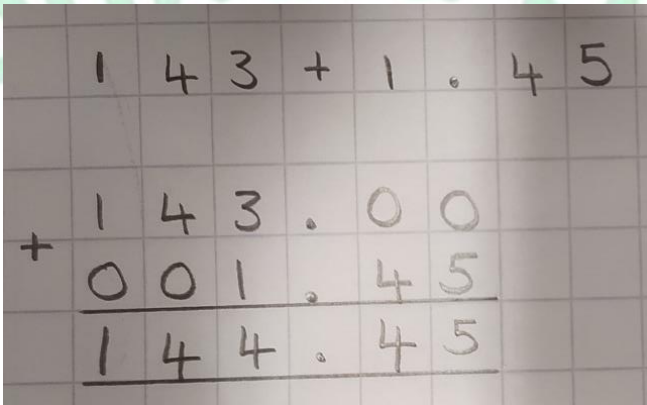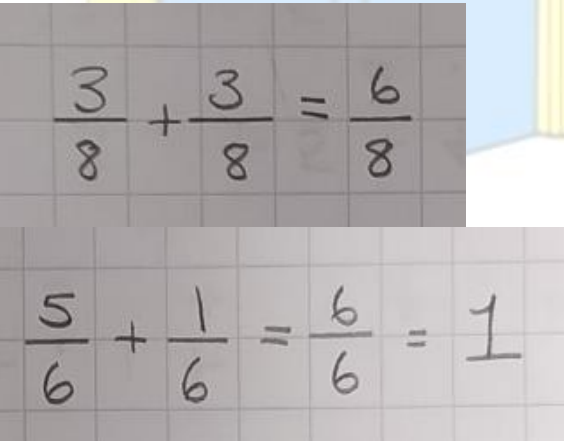
Key vocabulary:

Increase, sum, total, altogether, score, double, near double, carry, doorstep, equals, tenths, hundredth, decimal point, decimal, numerator, denominator

Mental Strategies:

- Adding decimals within 1
- Adding decimals crossing the whole

Progressive Key Skills	Method	Manipulatives/ Resources
Add whole numbers with more than 4d-column method (including exchanging)		NOTE: By Year 5, calculations use less manipulatives / resources as we want the children to begin to work towards being 'secondary ready'. Teachers will use manipulatives / resources where required where children are accessing calculations from below the Year 5 level. Where resources are used, they are noted below.
Adding decimals with the same number of decimal places		

Adding decimals with a different number of decimal places.	$4.6 + 7.054$ $\begin{array}{r} 4.600 \\ +\ 7.054 \\ \hline 11.654 \end{array}$ $13,867 + 28,345$ $\begin{array}{r} 13867 \\ +\ 28345 \\ \hline 42212 \end{array}$	Green pen used to add zeroes at the beginning of learning the process
Adding wholes and decimals	$143 + 1.45$ $\begin{array}{r} 143.00 \\ +\ 001.45 \\ \hline 144.45 \end{array}$	
Add fractions with the same denominator	$\dfrac{3}{8} + \dfrac{3}{8} = \dfrac{6}{8}$ $\dfrac{5}{6} + \dfrac{1}{6} = \dfrac{6}{6} = 1$	

Add fractions with an answer within 1 Different denominators that are multiples of one another	$$\frac{1}{4} + \frac{3}{8}$$ $$\times 2 \quad \frac{2}{8} + \frac{3}{8} = \frac{5}{8}$$ $$\frac{1}{6} + \frac{2}{3}$$ $$\frac{1}{6} + \frac{4}{6} \overset{\times 2}{=} \frac{5}{6}$$	
Add three fractions with different denominators that are multiples of one another.	$$\frac{1}{3} + \frac{1}{6} + \frac{1}{12}$$ $$\times 4 \quad \times 2 \quad \frac{4}{12} + \frac{2}{12} + \frac{1}{12} = \frac{7}{12}$$ $$\frac{1}{4} + \frac{3}{8} + \frac{5}{16}$$ $$\times 4 \quad \times 2 \quad \frac{4}{16} + \frac{6}{16} + \frac{5}{16} = \frac{15}{16}$$	

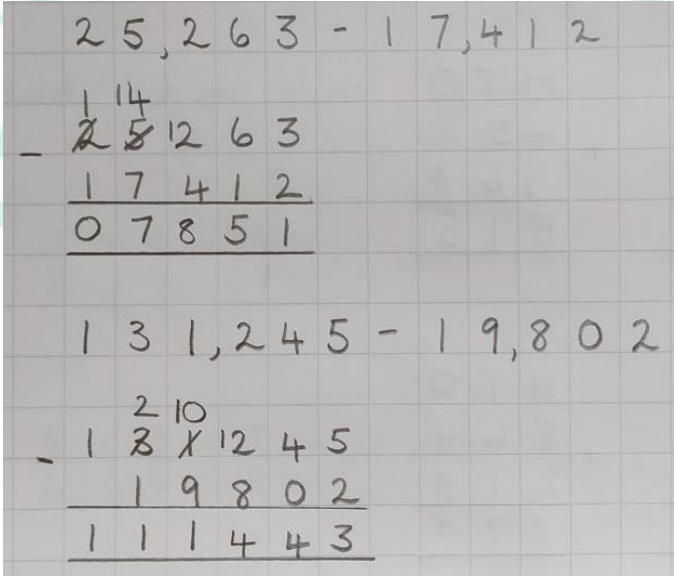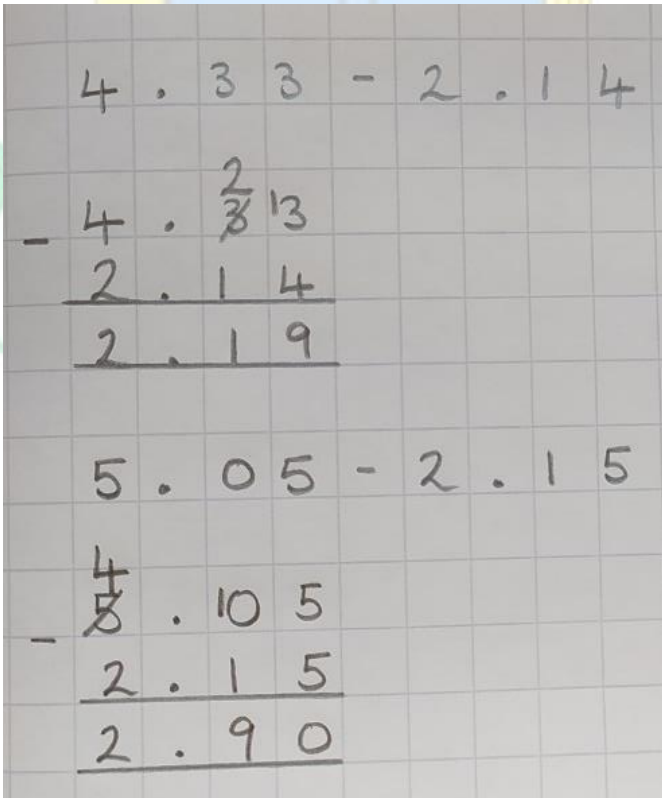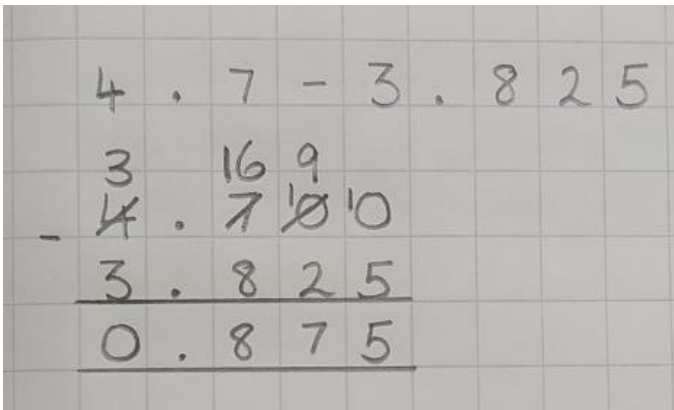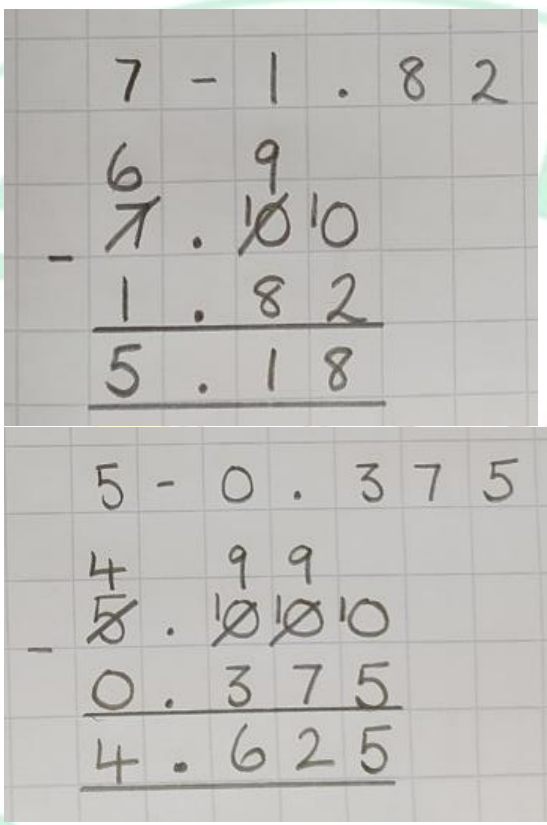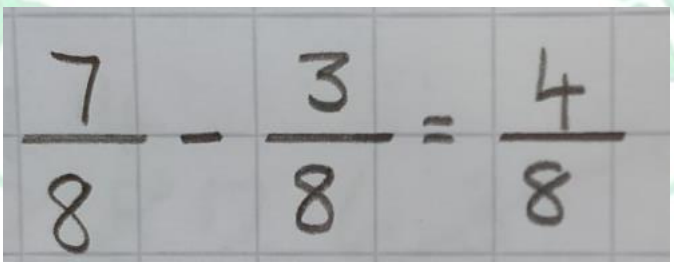|		
Add fractions with an answer that is more than 1 Different denominators that are multiples of one another. Convert answers from an improper fraction into a mixed number.	$$\frac{3}{4} + \frac{7}{8}$$ $$\left(\times 2\right)\frac{6}{8} + \frac{7}{8} = \frac{13}{8} = 1\frac{5}{8}$$ $$\frac{1}{3} + \frac{5}{6} + \frac{5}{12}$$ $$\left(\times 4\right)\frac{4}{12} + \left(\times 2\right)\frac{10}{12} + \frac{5}{12} = \frac{17}{12} = 1\frac{5}{12}$$	
Add mixed numbers. Method of adding the wholes then adding the parts. (do we do this? Is this reserved for Y6?)	$$1\frac{1}{3} + 2\frac{1}{6} = 3\frac{3}{6} = 3\frac{1}{2}$$ $$1 + 2 = \boxed{3}$$ $$\frac{1}{3} + \frac{1}{6}$$ $$\left(\times 2\right)\frac{2}{6} + \frac{1}{6} = \boxed{\frac{3}{6}}$$	

Year 5 Subtraction Progression Grid

Key vocabulary:
Minus, decrease, how many are left/left over, difference between, half, halve, how many more/fewer is… than…?, equals, decimal, decimal point, numerator, denominator

Mental Strategies:
- Subtracting decimals within 1

Progressive Key Skills	Method	Manipulatives/ Resources
Subtract whole numbers with more than 4d- column method.	25,263 - 17,412 $\begin{array}{r} 2\overset{1}{\cancel{5}}\overset{14}{\cancel{}}2\,6\,3 \\ -\ 1\,7\,4\,1\,2 \\ \hline 0\,7\,8\,5\,1 \end{array}$ 131,245 - 19,802 $\begin{array}{r} 1\,3\overset{2}{\cancel{}}\overset{10}{\cancel{}}\,1\,2\,4\,5 \\ -\ \ 1\,9\,8\,0\,2 \\ \hline 1\,1\,1\,4\,4\,3 \end{array}$	NOTE: By Year 5, calculations use less manipulatives / resources as we want the children to begin to work towards being 'secondary ready'. Teachers will use manipulatives / resources where required where children are accessing calculations from below the Year 5 level. Where resources are used, they are noted below.
Subtracting decimals with the same number of decimals places.	4.33 - 2.14 $\begin{array}{r} 4\,.\,\overset{2}{\cancel{3}}\,^{13} \\ -\ 2\,.\,1\,4 \\ \hline 2\,.\,1\,9 \end{array}$ 5.05 - 2.15 $\begin{array}{r} \overset{4}{\cancel{5}}\,.\,^{10}0\,5 \\ -\ 2\,.\,1\,5 \\ \hline 2\,.\,9\,0 \end{array}$	

Subtracting decimals with a different number of decimals places.	$4 . 7 - 3 . 8 2 5$ $\begin{array}{r} 3\ \overset{16}{}\ \overset{9}{} \\ - 4 . 7\ \cancel{0}\ ^{1}0 \\ 3 . 8\ 2\ 5 \\ \hline 0 . 8\ 7\ 5 \end{array}$	Green pen used to add zeroes at the beginning of learning the process
Subtracting wholes and decimals.	$7 - 1 . 8 2$ $\begin{array}{r} 6\ \ \ \overset{9}{} \\ - 7 . \cancel{0}\ ^{1}0 \\ 1 . 8\ 2 \\ \hline 5 . 1\ 8 \end{array}$ $5 - 0 . 3 7 5$ $\begin{array}{r} 4\ \ \overset{9}{}\ \overset{9}{} \\ - 5 . \cancel{0}\ ^{1}\cancel{0}\ ^{1}0 \\ 0 . 3\ 7\ 5 \\ \hline 4 . 6\ 2\ 5 \end{array}$	Green pen used to add zeroes at the beginning of learning the process
Subtract fractions with the same denominator	$\dfrac{7}{8} - \dfrac{3}{8} = \dfrac{4}{8}$	

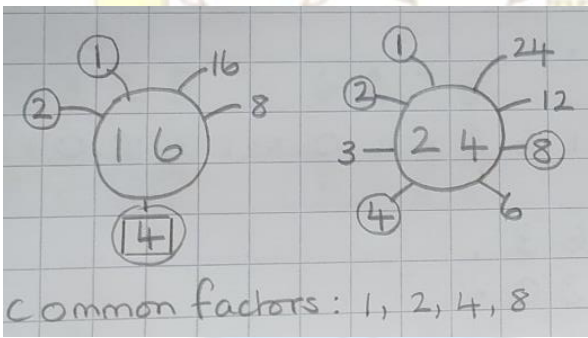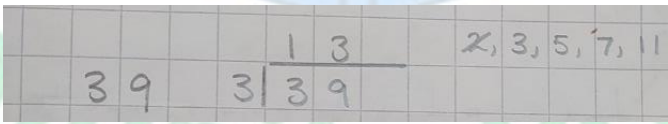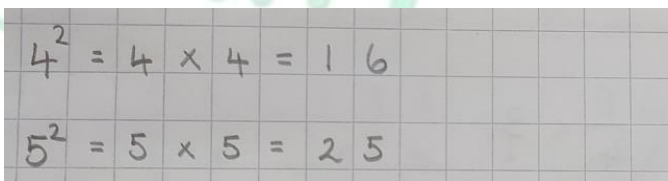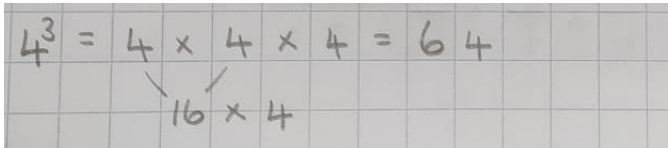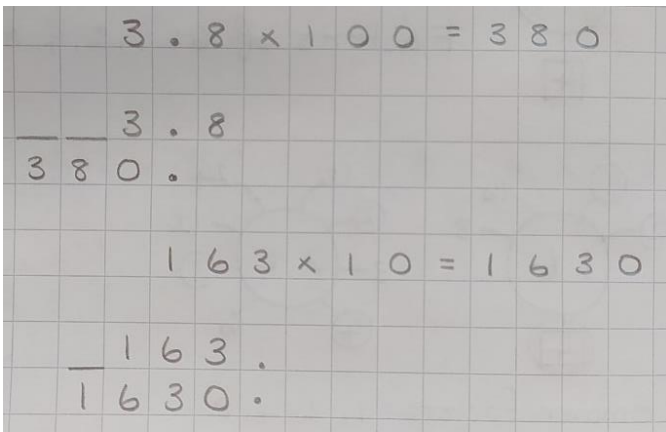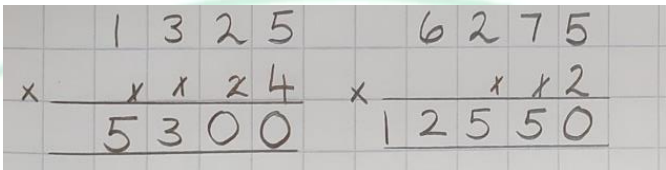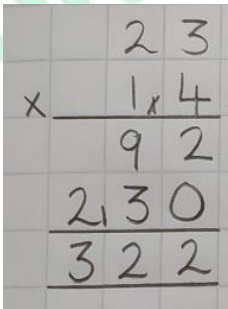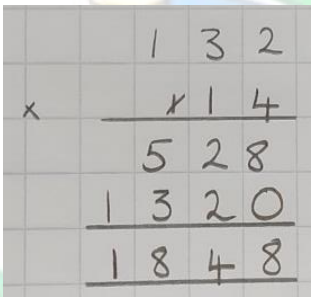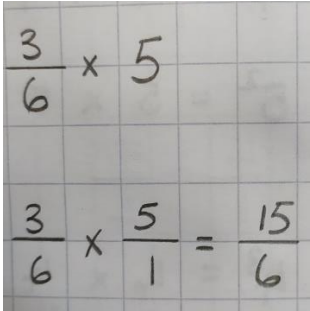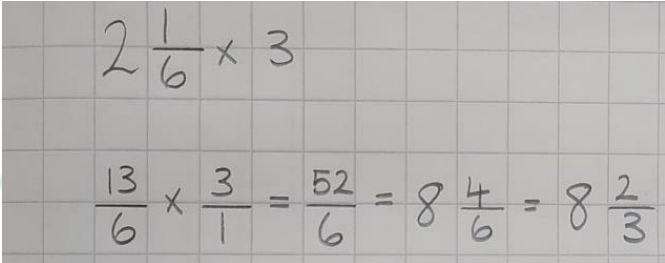|		
Subtract fractions with different denominators where one denominator is a multiple of the other.	$\times 2 \left(\dfrac{1}{4} - \dfrac{1}{8} \right.$ $\left. \dfrac{2}{8} - \dfrac{1}{8} = \dfrac{1}{8} \right.$	
Subtract mixed numbers where one denominator is a multiple of the other.	$1\dfrac{2}{5} - \dfrac{3}{10}$ $\times 2 \left(\dfrac{7}{5} - \dfrac{3}{10} \right.$ $\left. \dfrac{14}{10} - \dfrac{3}{10} = \dfrac{11}{10} = 1\dfrac{1}{10} \right.$	
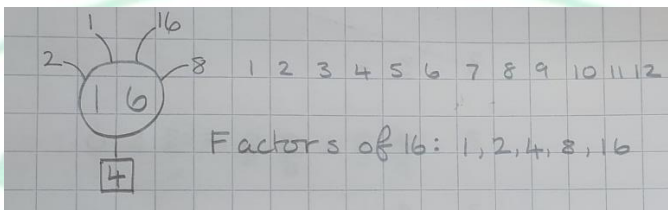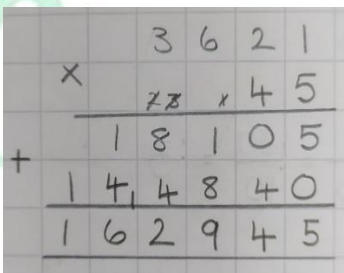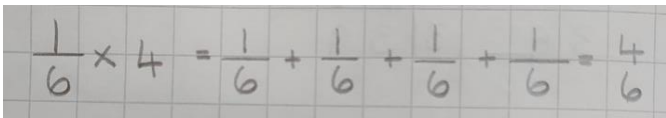
Year 5 Multiplication Progression Grid

Key vocabulary:
lots of, groups of, multiplication, multiply, multiplied by multiple of, product,
once, twice three times four times, five times…
ten times as hundred times as, thousand times as (big, long, wide, and so on)
repeated addition, row, column, double, carry, add a zero
factor, factor bug, square, cube, numerator, denominator

Progressive Key Skills	Method	Manipulatives/ Resources
Factors	Factors of 16: 1, 2, 4, 8, 16	NOTE: By Year 5, calculations use less manipulatives / resources as we want the children to begin to work towards being 'secondary ready'. Teachers will use manipulatives / resources where required where children are accessing calculations from below the Year 5 level. Where resources are used, they are noted below.
Common factors	common factors: 1, 2, 4, 8	
Prime numbers	2, 3, 5, 7, 11	
Square numbers	$4^2 = 4 \times 4 = 16$ $5^2 = 5 \times 5 = 25$	
Cube numbers	$4^3 = 4 \times 4 \times 4 = 64$ 16×4	

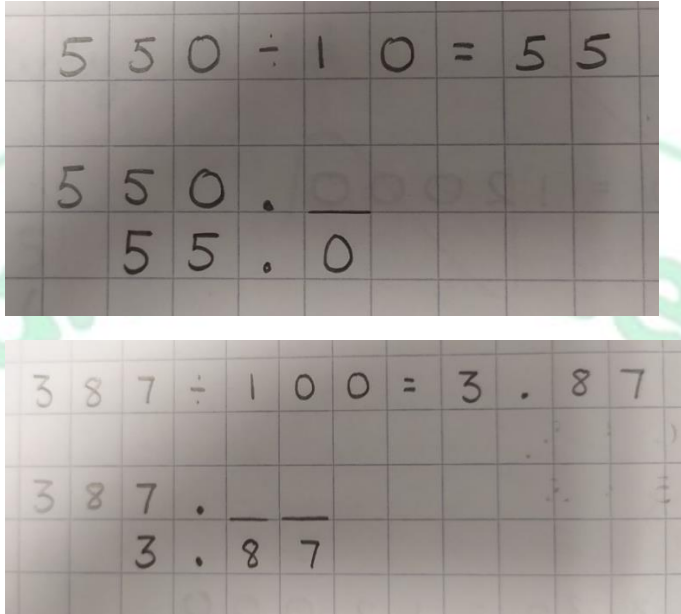|		
Multiplying by 10, 100 and 1000	3.8 × 100 = 380 3.8 380.	Place value grid
	163 × 10 = 1630 163. 1630.	
Multiply 4d x 1d	1325 × ×× 2 4 5300 6275 × ××2 12550	
Multiply 2d x 2d	23 × 1 4 9 2 2 3 0 3 2 2	Green pen used to add zeroes at the beginning of learning the process
Multiply 3d x 2d	1 3 2 × × 1 4 5 2 8 1 3 2 0 1 8 4 8	Green pen used to add zeroes at the beginning of learning the process
Multiply 4d x 2d	3 6 2 1 × ×× × 4 5 1 8 1 0 5 + 1 4 8 4 0 1 6 2 9 4 5	Green pen used to add zeroes at the beginning of learning the process
Multiply fractions by a whole number linked to repeated addition. (restricted to a numerator of 1)	$\frac{1}{6} \times 4 = \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} = \frac{4}{6}$	

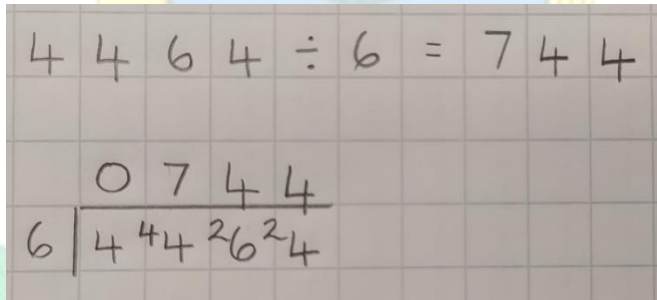| Multiply fractions by a whole number (numerators greater than 1)	$\frac{3}{6} \times 5$ $\frac{3}{6} \times \frac{5}{1} = \frac{15}{6}$	
Multiply a mixed number by a whole number	$2\frac{1}{6} \times 3$ $\frac{13}{6} \times \frac{3}{1} = \frac{52}{6} = 8\frac{4}{6} = 8\frac{2}{3}$	
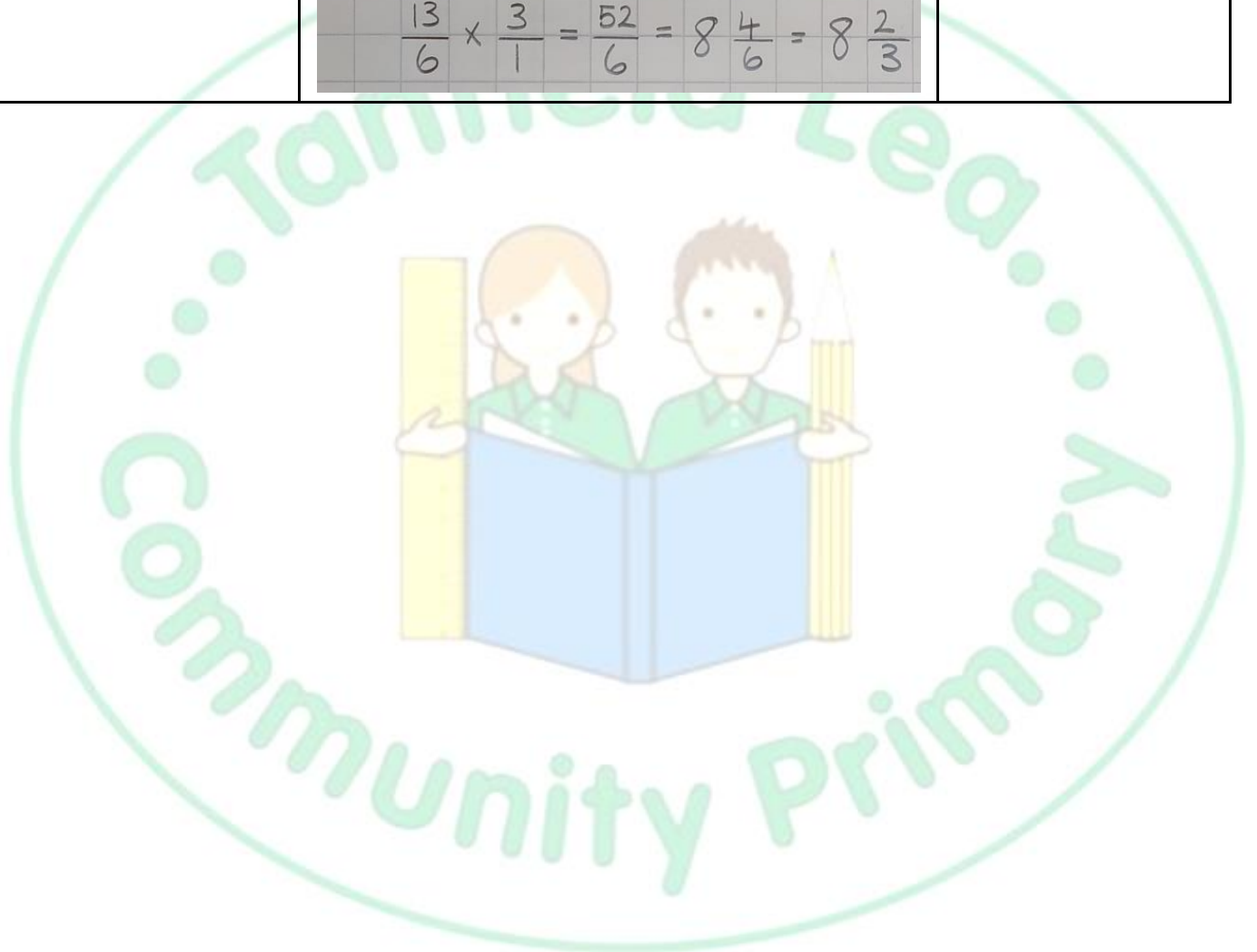
Year 5 Division Progression Grid

Key vocabulary:
share equally divide, division, divided by, divided into, divisible by remainder factor, quotient inverse, ready reckoner, ten times smaller, hundred times smaller, thousand times smaller

Progressive Key Skills	Method	Manipulatives/ Resources
Dividing by 10, 100 and 1000	$550 \div 10 = 55$ 550. 55.0 $387 \div 100 = 3.87$ 387. 3.87	NOTE: By Year 5, calculations use less manipulatives / resources as we want the children to begin to work towards being 'secondary ready'. Teachers will use manipulatives / resources where required where children are accessing calculations from below the Year 5 level. Where resources are used, they are noted below. Place value grid
Dividing 4d by 1d	$464 \div 6 = 74$ 0 7 4 4 6 | 4 4⁴ 6² 4	
Divide with remainders	$320 \div 7 = 447^{R1}$ 0 4 4 7 ^{R1} 7 | 3 ³1 ³2 ⁵0	