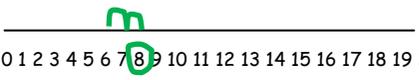
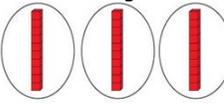
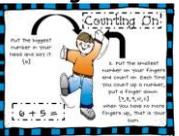
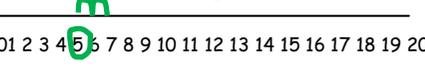


Yr	Focus:	<p style="text-align: center;"><u>Addition</u></p> <p>Recognition of the number system to support addition - develop conceptual understanding of the number system.</p> <ul style="list-style-type: none"> Number Association  Order - to 20.  	<p style="text-align: center;"><u>Subtraction</u></p>	<p style="text-align: center;"><u>Multiplication</u></p>	<p style="text-align: center;"><u>Division</u></p>
RECEPTION Conceptual awareness Understanding of the meaning of mathematical symbols. Problem solving.		<ul style="list-style-type: none"> Fill missing numbers 	<p>Use of concrete resources to introduce addition in problem solving.</p>  <ul style="list-style-type: none"> What is one less? What is the number before? <p>Counting back to takeaway?</p> <p>Counting back using bead strings</p> $10 - 3 = 7$  <p>Counting back in ones using a numberline.</p> <p>0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20</p> $8 - 2 = 6$ 	<p>Use concrete resources to develop conceptual awareness of multiplication.</p> <p>Begin counting on in 2's; how many lots of 2?</p>  <p>Then counting on in 10's; how many lots of 10?</p>  <p>Make and use beadstrings; how many lots of 2, 5, 10?</p> 	<p>Use concrete resources to develop conceptual awareness of division.</p> <p>Children will understand the concept of equal groups and share items out in play and problem solving.</p> 
	<p>Bead strings to support understanding - how many ways can you make?</p> <p>  $10 - 5 = 5$  $10 - 1 = 9$  $10 - 2 = 8$ </p> <p>Use of concrete resources to introduce addition in problem solving.</p>  <ul style="list-style-type: none"> What is one more/one less? What is the number before/after?etc. <p>Counting on to add - 1 digit numbers?</p>  <p>Counting on using bead strings</p> $3 + 7 = 10$  <p>Count on in ones using a numberline.</p> <p>0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20</p> $5 + 2 = 7$ 				

Addition

Use concrete resources to develop addition number facts to 20

Number bonds to 10 and 20. Eg Bead strings, Lego, Multilink, Objects



$3+7=10$

Doubling within 20.

$2+2 = 4$

$5+5 = 10$

$6+6 = 12$

double 2 is 4

double 5 is 10

double 6 is 12



Develop ways of recording calculations using pictures to develop number facts to 20.

Understanding of number bonds to 10 and 20.



$7+13=20$



$9+11=20$

Doubling within 20.



$4+4=8$

double 4 is 8

Use concrete resources to solve addition problems.

- What is one more?



- What is the number after?
- Count on from?
- Increase by?
- Add on?

Count on in ones using a numberline up to 20.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

$13+3=16$

Construct own number line.

Use measuring tools to help solve addition problems in practical contexts. Include capacity.



How long are the snakes put together?



How much paint altogether?

Subtraction

Use concrete resources to develop subtraction number facts to 20

Learn to manipulate number bonds to 10 and 20. Eg Bead strings, Lego, Multilink, Objects



$\text{If } 3+7=10 \text{ then } 10-7=3$

Halving within 20.

$4-2=2$

$10-5 = 5$

$12-6 = 6$

Half of 4 is 2

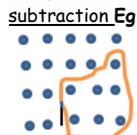
Half of 10 is 5

Half of 12 is 6

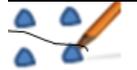


Develop ways of recording calculations using pictures to develop number facts to 20.

Using number bonds to 10 and 20 to help subtraction Eg. $20-7=13$



Halving within 20.



half 4 is 2

Use concrete resources to solve subtraction problems.



- What is one less than?
- What is the number before?
- Count back from?

- Reduce by?
- Takeaway?

$6-4=2$

Count back in ones using a numberline up to 20.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

$13-3=10$

Construct own number line.

Use measuring tools to help solve subtraction problems in practical contexts. Include capacity.



The difference is?



5 litres

3 litres

How much more is one tin of paint than the other?

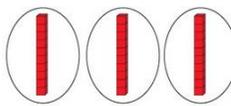
Multiplication

Use concrete resources to develop conceptual awareness of multiplication.

Begin counting on in 2's



Then counting on in 10's



Make and use beadstrings

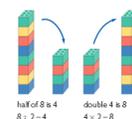


Then begin to count on in 5s.

Children will understand the concept of doubles and link this to multiplying by 2.

$2+2 = 4$

double 2 is 4



half of 8 is 4
 $8 \div 2 = 4$

double 4 is 8
 $4 \times 2 = 8$

Develop ways of recording calculations using pictures Eg $3 \times 2 = 6$



Begin to use arrays with the support of an adult and make connections with counting on in two's.



Division

Use concrete resources to develop conceptual awareness of division.

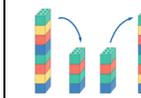
Children will understand the concept of equal groups and share items out in play and problem solving.



Children will understand the concept of half and that this is sharing into 2 equal sets.



$4 \div 2 = 2$



half of 8 is 4
 $8 \div 2 = 4$

double 4 is 8
 $4 \times 2 = 8$

Children will begin to link division with fractions of objects, numbers and quantities.



Half of 4 is 2

$4 \div 2 = 2$

Addition

Recall and use addition facts to 20 fluently.

Use concrete resources to derive and use addition facts to 100 in multiples of tens.

Number bonds to 100

Beadstrings  10+90=100
Teacher to model link between beadstrings and number lines



Number lines

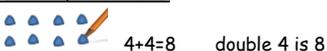

Develop ways of recording calculations using pictures to develop number facts to 100.

Record number bonds to 10, 20 and 100 using pictorial representations.



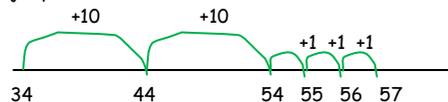
$7+13=20$ $9+11=20$

Doubling within 100.

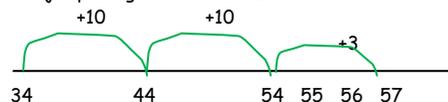


Use a familiar method to solve addition problems using up to two 2- digit numbers or three 1-digit numbers.

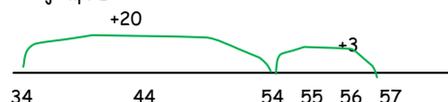
Start by adding the smallest 2 digit number to the largest 2 digit number. Add tens on first. Begin with adding one ten at a time. Then add on units in jumps of ones. EG. $34+23=57$



Teach a more efficient method by adding units in one jump using known facts. EG. $34+23=57$



Then by adding tens in one jump and then units in one jump. EG $34+23=57$



Use measuring tools to help solve addition problems in practical contexts. Include capacity.

Recognise inverse relationships between operations.



missing signs and numbers $3+4=\square$, $\square=3+4$, $3+\square=7$, $7=\square+4$, $7-\square=3$
Teach that addition is commutative (can be in any order) and that subtraction is not.

Subtraction

Recall and use addition facts to 20 to help discover subtraction facts.

Use concrete resources to derive and use subtraction facts to 100 in multiples of tens.

Number bonds to 100

Beadstrings  100-90=10

Develop ways of recording calculations using pictures to develop number facts to 100.

Record number bonds to 10, 20 and 100 using pictorial representations.



$20-13=7$ $20-11=9$

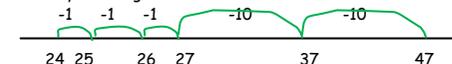
Halving within 100.



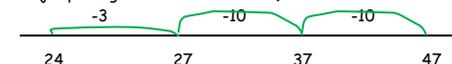
Use a familiar method to solve subtraction problems using up to two 2- digit numbers or three 1-digit numbers.

Children use empty number lines to support subtraction calculations.

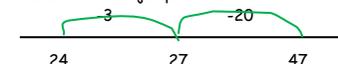
Start by counting back in tens and ones. EG. $47-23=24$



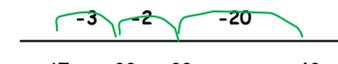
Use known number facts to become more efficient (units in one jump using known number facts.)



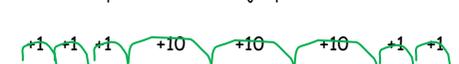
Then progress children to subtracting tens in one jump and then units in one jump.



Bridging through ten can help children be more efficient. EG. $42-25=17$



Then counting on; when numbers are near to multiples of 10, 100 etc it may be more efficient to count on. EG. $82-47=35$; count up from 47 to 82 in jumps of 10 and then 1.



Move onto: Units in one jump; Tens in one jump and units in one jump; Bridging through ten

Multiplication

Recall and use multiplication facts for the 2, 5 and 10 multiplication tables.

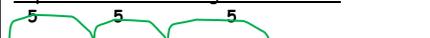
Begin to record multiplication tables and write them using the multiplication (X) and equals sign (=).

Children to understand that multiplication is commutative.

Children to use concrete resources to support multiplication. EG. 3 lots of 4 are 12 or $3 \times 4 = 12$



Children to use jottings to support calculation Repeated addition using a number line



0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

3 times 5 is $5+5+5=15$

3 lots of 5

5×3



0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

Teach children that multiplication is commutative and can be done either way.

Use arrays and make connections with counting on in different multiples.



$3 \times 4 = 12$

Make links between arrays and repeated addition. $3+3+3=12$

Use familiar methods to solve multiplication problems and relate multiplication to fractions and measures.

Relate multiplication tables to counting in 5 minute intervals.

Recognise inverse relationships between operations.

Teach that multiplication is commutative (can be in any order) and that division is not.

Division

Recall and use division facts for the 2, 5 and 10 multiplication tables.

Begin to record division statements and write them using the division (\div) and equals sign (=).

Children to use concrete resources to support division. EG. How many will each child get? $12 \div 3 = 4$



Children will understand the concept of half and that this is sharing into 2 equal sets.



$4 \div 2 = 2$

Use repeated subtraction to develop concept of grouping using a number line



0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

$15 \div 3 = 3$

$15 \div 3$

3 lots of 5

Use arrays to understand how many lots an amount shares into



$12 \div 3 = 4$

Make links between arrays and repeated subtraction. $12 - 4 - 4 - 4$

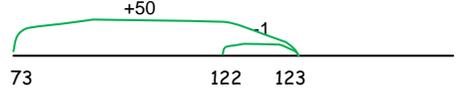
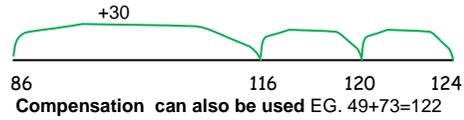
Conceptual awareness
 Increased Mental fluency with whole numbers
 Read, write and interpret mathematical symbols and calculations with increasingly large whole numbers
 Problem solving including with simple fractions and decimals.

Addition

Use familiar methods to solve addition problems mentally using :

- a 3-digit number and ones.
- a 3-digit number and tens.
- a 3-digit number and hundreds.

Count on from the largest number irrespective of order. EG. $38+86=124$



Use formal written methods of columnar addition *adding the least significant digits first.*

$$\begin{array}{r} 67 \\ + 24 \\ \hline 11 \text{ (7+4)} \\ \underline{80} \text{ (60+20)} \\ 91 \end{array} \qquad \begin{array}{r} 267 \\ + 85 \\ \hline 12 \text{ (7+5)} \\ \underline{140} \text{ (80+60)} \\ 352 \end{array}$$

Use number facts and standard written approaches to resolve missing number problems.

Add fractions with the same denominator within one whole.

Use pictorial representations to aid conceptual understanding

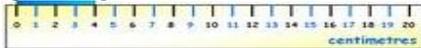


Use standard written methods

Write the problem in a number sentence. Add the numerators over the same denominator

$$\begin{aligned} & \frac{1}{4} + \frac{1}{4} \\ &= \frac{1+1}{4} \\ &= \frac{2}{4} \end{aligned}$$

Add money, length (m/cm/mm); mass (kg/g) volume/ capacity (l/ml). Use different scales (making links to number lines) to support addition eg. counting on.



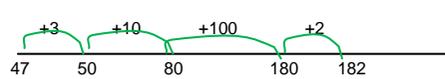
Subtraction

Use familiar methods to solve subtraction problems mentally using :

- a 3-digit number and ones.
- a 3-digit number and tens.
- a 3-digit number and hundreds.

Use a familiar method to solve subtraction problems

Counting on; when numbers are near to multiples of 10, 100 etc it may be more efficient to count on. EG. $182-47=135$; count up from 47 to 82 in jumps of 10 and then 1.



Use formal written methods of columnar subtraction.

Initially children will use examples that do not involve exchange. EG. $89-57=$

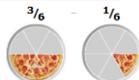
$$\begin{array}{r} 89 \\ -57 \\ \hline 30 \quad 2 = 32 \end{array}$$

Then begin to exchange. EG. $71-46=$

$$\begin{array}{r} 71 \\ -46 \\ \hline 20 \quad 5 = 25 \end{array}$$

Subtract fractions with the same denominator within one whole.

Use pictorial representations to aid conceptual understanding



Use standard written methods

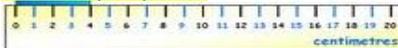
Write the problem in a number sentence.

Subtract the numerators over the same

denominator

$$\begin{aligned} & \frac{3}{6} - \frac{1}{6} \\ &= \frac{3-1}{6} \\ &= \frac{2}{6} \end{aligned}$$

Subtract money, length (m/cm/mm); mass (kg/g) volume/ capacity (l/ml)..



Multiplication

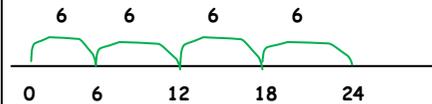
Use familiar methods to solve multiplication problems mentally using :

- recall of multiplication facts for the 3,4, 6 and 8 multiplication tables.
- Knowing that multiplying by 10 or 100 will shift the digit to the left by the appropriate number.

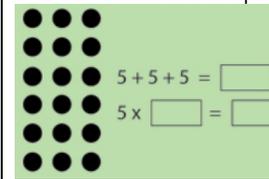
Write and calculate mathematical statements for multiplication including two-digit numbers times one-digit numbers.

Repeated addition using a number line
 4 times 6 is $6+6+6+6=24$ or 4 lots of 6 or 4×6

Children should use number lines to support understanding.



Use arrays and encourage links between arrays and number statements and repeated addition.



Children will begin to use partitioning to support multiplication.

$$\begin{aligned} 38 \times 5 &= (30 \times 5) + (8 \times 5) \\ &= 150 + 40 \\ &= 190 \end{aligned}$$

Solve problems, including positive integer scaling problems.

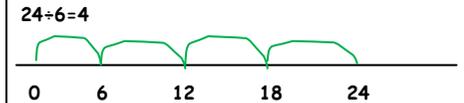
Division

Recall and use division facts for 3,4,6 and 8 multiplication tables.

Record division statements and write them using the division (\div) and equals sign ($=$).

Use reliable written methods for division, dividing two-digit numbers by a one-digit number.

Initially using repeated subtraction
 Children use empty number line to support their calculation.



Progress children to using formal written methods of short division with exact answers.

$$\begin{array}{r} 11 \\ 7 \overline{) 77} \\ \underline{77} \\ 0 \end{array} \qquad \begin{array}{r} 14 \\ 9 \overline{) 98} \\ \underline{90} \\ 8 \end{array}$$

Solve problems, including positive integer scaling problems.

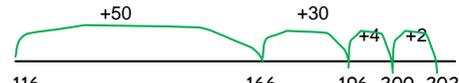
Teach children methods to check their calculations:

- Recognise inverse relationships between operations use this to check calculation. Remind children that addition and multiplication are commutative (can be in any order) and that subtraction and division are not.
- Use estimation to check work.

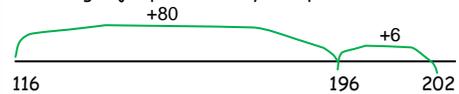
Addition

Use familiar methods to solve addition problems mentally using jottings in a number line with up to 4 digit numbers :

Count on from the largest number irrespective of order. EG. $116+86=202$



Take larger jumps as fluency is improved



Use formal written methods of columnar addition to add up to 4 digit numbers *adding the least significant digits first.*

$$\begin{array}{r} 1267 \\ + 1185 \\ \hline 12 \text{ (} 7+ 5) \\ 140 \text{ (} 80+ 60) \\ 200 \text{ (} 200+ 100) \\ 2000 \text{ (} 1000+ 1000) \\ \hline 2352 \end{array}$$

Teach how to carry below the line.

$$\begin{array}{r} 1267 \\ + 1125 \\ \hline 2392 \\ 1 \end{array} \quad \begin{array}{r} 1267 \\ + 1185 \\ \hline 2452 \\ 11 \end{array} \quad \begin{array}{r} 1267 \\ + 1885 \\ \hline 3152 \\ 111 \end{array}$$

Solve two-step problems deciding on operations and methods. Using the carrying method or an appropriate mental method children solve money or measure problems; making sure that decimal points should line up.

Add fractions with the same denominator.

Use standard written methods

Write the problem in a number sentence. Add the numerators over the same denominator

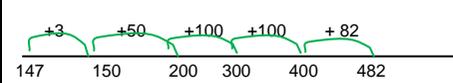
$$\frac{1}{7} + \frac{5}{7} = \frac{1+5}{7} = \frac{6}{7}$$

Becoming more fluent and dealing with increasingly complex problems beyond one whole.

Subtraction

Continue to use familiar methods to solve subtraction problems mentally using jottings counting on using a number line with up to 4 digit numbers :

EG. $482-147=135$



Use formal written methods of columnar subtraction using increasingly large whole numbers.

Using exchange. EG. $754-86=$

$$\begin{array}{r} 600 \quad 140 \quad 1 \\ 754 \quad \cancel{700} \quad \cancel{50} \quad 4 \\ -86 \quad \quad \quad 80 \quad 6 \\ \hline 600 \quad 60 \quad 8 = 668 \end{array}$$

Move children onto decomposition

$$\begin{array}{r} 6141 \\ \cancel{7} \cancel{5} 4 \\ - 86 \\ \hline 668 \end{array}$$

Solve two-step problems deciding on operations and methods. Using the carrying method or an appropriate mental method children solve money or measure problems; making sure that decimal points should line up.

Subtract fractions with the same denominator.

Use standard written methods

Write the problem in a number sentence. Add the numerators over the same denominator

$$\frac{5}{7} - \frac{1}{7} = \frac{5-1}{7} = \frac{4}{7}$$

Multiplication

Use familiar methods to solve multiplication problems mentally for three digit numbers using :

- recall of multiplication facts for multiplication tables up to 12X12.
- Knowing that multiplying by 10 or 100 will shift the digit to the left by the appropriate number of places.
- Use derived facts to multiply, including by 0 and 1.
- Multiplying together three numbers.

Recall and use multiplication facts for multiplication tables up to 12X12.

Use two-digit and three-digit numbers by one-digit number using formal written methods. EG. $346 \times 9 =$

X	300	40	6
9	2700	360	54

$$\begin{array}{r} 2700 \\ 360 \\ + 54 \\ \hline 3114 \\ 11 \end{array}$$

Solve problems including using distributive law; multiply a number by a group of numbers added together is the same as doing each multiplication separately
 EG. $3 \times (2 + 4) = 3 \times 2 + 3 \times 4$

Children build procedural fluency with short multiplication (guidance in 2014 curriculum)

$$\begin{array}{r} 24 \times 6 \\ \hline 144 \\ 2 \end{array} \quad \begin{array}{r} 342 \times 7 \\ \hline 2394 \\ 21 \end{array} \quad \begin{array}{r} 2741 \times 6 \\ \hline 16446 \\ 42 \end{array}$$

Solve two-step problems deciding on operations and methods.

Division

Use familiar methods to solve division problems mentally for three digit numbers using:

- recall and use division facts for multiplication tables up to 12X12.
- Knowing that dividing by 10 or 100 will shift the digit to the right by the appropriate number of places.
- Use derived facts to divide, including by 1. (For example $600 \div 3 = 200$ is derived from $6 \div 3 = 2$).

Children build procedural fluency with short division with exact answers.

$$\begin{array}{r} 87 \\ 5 \overline{) 435} \\ \underline{40} \\ 35 \\ \underline{30} \\ 5 \end{array}$$

Answer: 87

Children should calculate the effect of dividing one- and two- digit numbers by 10 and 100 using place value and begin to identify answer as ones, tenths and hundredths.

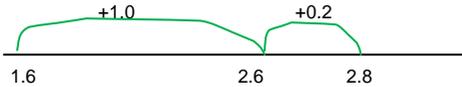
Teach children methods to check their calculations:

- Recognise inverse relationships between operations use this to check calculation. Remind children that addition is commutative (can be in any order) and that subtraction is not.
- Use estimation to check work.

Addition

Use familiar methods to solve addition problems mentally with increasingly large whole numbers to aid fluency (more than 4 digits).

Mentally add tenths and one-digit numbers and tenths. Continue to show children to count on using a blank number line encourage visualisation of number lines. $1.2+1.6=$



Make links between known number facts and decimals
Eg. $0.8 + 0.2 = 1$, $0.83 + 0.17 = 1$

Use formal written methods of columnar addition with numbers of more than 4 digits adding the least significant digits first.

$$\begin{array}{r} 1267 \\ + 1125 \\ \hline 2392 \\ 1 \end{array} \quad \begin{array}{r} 1267 \\ + 1185 \\ \hline 2452 \\ 11 \end{array} \quad \begin{array}{r} 1267 \\ + 1885 \\ \hline 3152 \\ 111 \end{array}$$

Solve two-step problems deciding on operations and methods. (Including money, measure and time).

Solve problems involving number up to 3 decimal places, including a mix of whole numbers and decimals; making sure that decimal points should line up.

$$\begin{array}{r} 1.673 \\ + 1.125 \\ \hline 2.798 \\ 1 \end{array} \quad \begin{array}{r} 1.613 \\ + 1.178 \\ \hline 2.791 \\ 1 \end{array} \quad \begin{array}{r} 1.677 \\ + 1.885 \\ \hline 3.562 \\ 111 \end{array}$$

Add fractions using standard written methods
Where the numerators are over the same

denominator

$$\frac{1}{7} + \frac{5}{7}$$

$$= \frac{1+5}{7}$$

$$= \frac{6}{7}$$

Or where denominators are multiples of the same number

Use knowledge of equivalence to make sure denominators are the same.

$$\frac{1}{5} + \frac{5}{10} = \frac{2}{10} + \frac{5}{10}$$

Continue as taught

$$= \frac{2+5}{10}$$

$$= \frac{7}{10}$$

Where there are mixed fractions

Convert mixed fractions to improper fractions

$$2\frac{3}{4} + 3\frac{1}{2}$$

$$= \frac{11}{4} + \frac{7}{2}$$

Use knowledge of equivalence to make sure

denominators are the same.

$$= \frac{11}{4} + \frac{14}{4}$$

$$= \frac{11+14}{4}$$

$$= \frac{25}{4}$$

$$= 6\frac{1}{4}$$

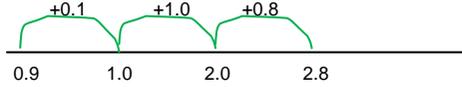
Subtraction

Use familiar methods to solve subtraction problems mentally with increasingly large whole numbers to aid fluency (more than 4 digits).

Mentally subtract tenths and one-digit numbers and tenths.

Continue to show children to count on to help subtraction

$$2.8+0.9=$$



Make links between known number facts and decimals
Eg. $1.0 - 0.8 = 0.2$, $1.0 - 0.17 = 0.83$

Use formal written methods of columnar subtraction with numbers of more than 4 digits subtracting the least significant digits first.

$$\begin{array}{r} 1467 \\ - 1125 \\ \hline 342 \end{array} \quad \begin{array}{r} 2293 \\ - 1185 \\ \hline 1108 \end{array}$$

$$\begin{array}{r} 1117.1 \\ - 2287 \\ \hline 1398 \end{array}$$

Solve two-step problems deciding on operations and methods. (Including money, measure and time).

Solve problems involving number up to 3 decimal places, including a mix of whole numbers and decimals; making sure that decimal points should line up.

Subtract fractions using standard written methods.

Write the problem in a number sentence. Add the numerators over the same denominator

$$\frac{5}{7} - \frac{1}{7}$$

$$= \frac{5-1}{7}$$

$$= \frac{4}{7}$$

Or where denominators are multiples of the same number

Use knowledge of equivalence to make sure denominators are the same.

$$\frac{5}{10} - \frac{1}{5} = \frac{5}{10} - \frac{2}{10}$$

Continue as taught

$$= \frac{5-2}{10}$$

$$= \frac{3}{10}$$

Where there are mixed fractions

Convert mixed fractions to improper fractions

$$\text{Subtract } 1\frac{5}{6} \text{ from } 3\frac{1}{2}$$

$$= \frac{7}{2} - \frac{11}{6}$$

Use knowledge of equivalence to make sure denominators are the same.

$$= \frac{21}{6} - \frac{11}{6} = \frac{21-11}{6} = \frac{10}{6} = 1\frac{4}{6} = 1\frac{2}{3}$$

$$= \frac{21}{6} - \frac{11}{6} = \frac{21-11}{6} = \frac{10}{6} = 1\frac{4}{6} = 1\frac{2}{3}$$

$$= \frac{21}{6} - \frac{11}{6} = \frac{21-11}{6} = \frac{10}{6} = 1\frac{4}{6} = 1\frac{2}{3}$$

$$= \frac{21}{6} - \frac{11}{6} = \frac{21-11}{6} = \frac{10}{6} = 1\frac{4}{6} = 1\frac{2}{3}$$

Multiplication

Use familiar methods to solve multiplication problems mentally for four digit numbers using :

- recall of multiplication facts for multiplication tables up to 12X12.
- Knowing that multiplying by 10, 100 or 1000 will shift the digit to the left by the appropriate number of places.
- Use derived facts to multiply, including by 0 and 1.
- Multiplying together three numbers.

Multiply numbers up to 4 digits by a one- or two-digit number using short and long multiplication where applicable.

Do we want to continue to teach the grid method as a pre-cursor to Long Mult?

$$2741 \times 6 \quad 124 \times 26$$

$$\begin{array}{r} 2741 \\ \times 6 \\ \hline 16446 \\ 42 \end{array} \quad \begin{array}{r} 124 \\ \times 26 \\ \hline 744 \\ 2480 \\ \hline 3224 \end{array}$$

Answer: 3224

Recognise and use square and cube numbers, and their notation (2) and (3). Use this knowledge to solve problems.

$$4^2 = 4 \times 4$$

$$4^3 = 4 \times 4 \times 4$$

Solve two-step problems deciding on operations and methods. (Including money, measure, time and scaling).

Identify multiples and factors; finding all factor pairs of a number and common factors of 2 numbers.

Solve problems including using distributive law; multiply a number by a group of numbers added together is the same as doing each multiplication separately

$$\text{EG. } a(b+c) = ab+ac$$

Multiply proper fractions and mixed numbers by whole numbers supported by materials and diagrams.

$$\text{EG } 1\frac{3}{8} \times 3 =$$



Convert mixed number into an improper fraction

$$1\frac{3}{8} = \frac{11}{8}$$

Then times by the whole number

$$\frac{33}{8}$$

Convert to a mixed number $4\frac{1}{8}$

Division

Use familiar methods to solve division problems mentally for four digit numbers using:

- recall and use division facts for multiplication tables up to 12X12.
- Knowing that dividing by 10, 100 and 1000 will shift the digit to the right by the appropriate number of places.
- Use derived facts to divide, including by 1. (For example $600 \div 3 = 200$ is derived from $6 \div 3 = 2$).

Divide numbers up to 4 digits by a one-digit number using short division and interpret remainders appropriately.

$$\begin{array}{r} 870 \text{ r } 2 \\ 5 \overline{) 44352} \\ \underline{20} \\ 24 \\ \underline{20} \\ 43 \\ \underline{40} \\ 35 \\ \underline{30} \\ 52 \\ \underline{50} \\ 2 \end{array}$$

Answer: 870 remainder 2

$$\begin{array}{r} 870 \text{ r } 2 \\ 5 \overline{) 44352} \\ \underline{20} \\ 24 \\ \underline{20} \\ 43 \\ \underline{40} \\ 35 \\ \underline{30} \\ 52 \\ \underline{50} \\ 2 \end{array}$$

Answer: $870\frac{2}{5}$ or $870\frac{1}{10}$

Solve two-step problems deciding on operations and methods. (Including money, measure, time and scaling).

Addition

Use familiar methods to solve addition problems mentally with increasingly large numbers and more complex calculations to aid fluency.

Use formal written methods of columnar addition with increasingly large numbers *adding the least significant digits first*.

$$\begin{array}{r} 1267 \\ + 1125 \\ \hline 2392 \end{array}$$

$$\begin{array}{r} 1267 \\ + 1185 \\ \hline 2452 \end{array}$$

$$\begin{array}{r} 1267 \\ + 1885 \\ \hline 3152 \end{array}$$

Solve two-step problems deciding on operations and methods. (Including money, measure and time).

Solve problems involving number up to 3 decimal places, including a mix of whole numbers and decimals; making sure that decimal points should line up.

$$\begin{array}{r} 1.673 \\ + 1.125 \\ \hline 2.798 \end{array}$$

$$\begin{array}{r} 1.613 \\ + 1.178 \\ \hline 2.791 \end{array}$$

$$\begin{array}{r} 1.677 \\ + 1.885 \\ \hline 3.562 \end{array}$$

Continue to add fractions using standard written methods

Where the numerators are over the same denominator

$$\frac{1}{7} + \frac{5}{7} = \frac{1+5}{7} = \frac{6}{7}$$

Or where denominators are multiples of the same number

Use knowledge of equivalence to make sure denominators are the same.

$$\frac{1}{5} + \frac{5}{10} = \frac{2}{10} + \frac{5}{10}$$

Continue as taught

$$= \frac{2+5}{10} = \frac{7}{10}$$

Where there are mixed fractions

Convert mixed fractions to improper fractions

$$2\frac{3}{4} + 3\frac{1}{2}$$

$$= \frac{11}{4} + \frac{7}{2}$$

Use knowledge of equivalence to make sure denominators are the same.

$$= \frac{11}{4} + \frac{14}{4} = \frac{11+14}{4} = \frac{25}{4}$$

Subtraction

Use familiar methods to solve subtraction problems mentally with increasingly large numbers and more complex calculations to aid fluency.

Use formal written methods of columnar subtraction with increasingly large numbers *adding the least significant digits first*.

$$\begin{array}{r} 1467 \\ - 1125 \\ \hline 342 \end{array}$$

$$\begin{array}{r} 81 \\ 22\cancel{3} \\ - 1185 \\ \hline 1108 \end{array}$$

$$\begin{array}{r} 1171 \\ - 2287 \\ \hline 1398 \end{array}$$

Solve multi-step problems in context deciding on operations and methods. (Including money, measure and time).

Solve problems involving number up to 3 decimal places, including a mix of whole numbers and decimals; making sure that decimal points should line up.

Continue to subtract fractions using standard written methods.

Write the problem in a number sentence. Add the numerators over the same denominator

$$\frac{5}{7} - \frac{1}{7} = \frac{5-1}{7} = \frac{4}{7}$$

Or where denominators are multiples of the same number

Use knowledge of equivalence to make sure denominators are the same.

$$\frac{5}{10} - \frac{1}{5} = \frac{5}{10} - \frac{2}{10}$$

Continue as taught

$$= \frac{5-2}{10} = \frac{3}{10}$$

Where there are mixed fractions

Convert mixed fractions to improper fractions

$$\text{Subtract } 1\frac{5}{6} \text{ from } 3\frac{1}{2}$$

$$= \frac{7}{2} - \frac{11}{6}$$

Use knowledge of equivalence to make sure denominators are the same.

$$= \frac{21}{6} - \frac{11}{6} = \frac{21-11}{6} = \frac{10}{6} = 1\frac{4}{6} = 1\frac{2}{3}$$

Multiplication

Use familiar methods to solve multiplication problems mentally with increasingly large numbers and more complex calculations to aid fluency. Use familiar methods to solve problems mentally using:

- recall of multiplication facts for multiplication tables up to 12X12.
- Knowing that multiplying by 10, 100 or 1000 will shift the digit to the left by the appropriate number of places.
- Use derived facts to multiply, including by 0 and 1.
- Multiplying together three numbers.

Multiply multi-digit numbers a two-digit number using formal methods of long multiplication where applicable.

$$124 \times 26$$

$$\begin{array}{r} 12 \\ 124 \\ \times 26 \\ \hline 744 \\ 2480 \\ \hline 3224 \end{array}$$

$$11$$

$$\text{Answer: } 3224$$

Division

Use familiar methods to solve division problems mentally with increasingly large numbers and more complex calculations to aid fluency. Use familiar methods to solve problems mentally using:

- recall and use division facts for multiplication tables up to 12X12.
- Knowing that dividing by 10, 100 and 1000 will shift the digit to the right by the appropriate number of places.
- Use derived facts to divide, including by 1. (For example $600 \div 3 = 200$ is derived from $6 \div 3 = 2$).

Divide numbers up to 4 digits by a two-digit number using: short division where appropriate. Interpret remainders as whole number remainders, fractions or by rounding appropriately.

$$11 \overline{) 45r1}$$

$$\text{Answer: } 45\frac{1}{11}$$

Long division and interpret remainders as whole number remainders, fractions or by rounding appropriately.

$$15 \overline{) 432}$$

$$\text{Answer: } 28 \text{ remainder } 12$$

$$15 \overline{) 432}$$

$$\text{Answer: } 28\frac{12}{15} = 28\frac{4}{5}$$

$$15 \overline{) 432.0}$$

$$\text{Answer: } 28.8$$

Solve two-step problems deciding on operations and methods. (Including money, measure, time and scaling).

