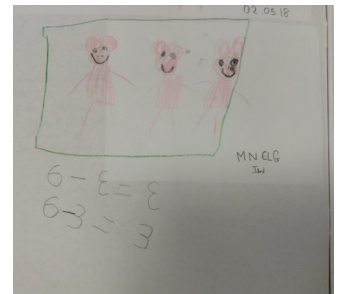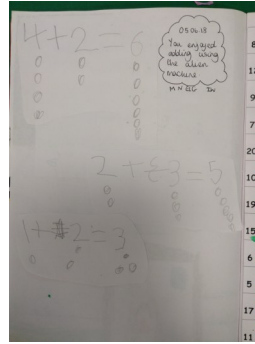# Calculation

Policy

2021

Foundation Stage

Maths Check List

(ELGs)

- Count reliably with numbers 1-20

- Order numbers correctly 1-20

- Say which number is one more or one less than a given number.

- Using quantities and objects, add and subtract two single digit numbers and count on and back to find the answer.

- Solve problems, including doubling, halving and sharing.

Written Calculation

Mental Strategies

- Doubling

- Halving

- One more

- One less

- To be able to subitise 1-10

Generalisations

- Addition makes numbers bigger.

- When introduced to the equals sign, children should see it as signifying equality.

- To be able to subitise 1-10

Year 1

Maths Check List

• Have instant recall of number bonds to 10

• Can form and read teens numbers correctly

• Count backwards and forwards in ones

• Count in twos and tens

• Write numbers correctly (no reversals)

• Understand the meaning of all 4 operations

• Know 1 more and 1 less

• Understand the value of each digit in a 2-digit number

• Know what = means

• Write 1 number in each square

Written Calculation

$$3 + 4 = 7$$
$$4 + 3 = 7$$
$$7 = 3 + 4$$
$$7 = 4 + 3$$

$$7 - 3 = 4$$
$$7 - 4 = 3$$
$$4 = 7 - 3$$
$$3 = 7 - 4$$

$$2 \times 5 = 10$$
$$5 \times 2 = 10$$
$$10 = 5 \times 2$$
$$10 = 2 \times 5$$

$$6 \div 2 = 3$$

Mental Strategies

• Doubling

• Halving

• Bonds to 10

• Bonds to 20

• Subtraction bonds from 10

• Partitioning to make use of known facts

Generalisations

• Addition makes numbers bigger.

• You can add numbers in any order and still get the same answer.

• When introduced to the equals sign, children should see it as signifying equality. They should become used to seeing it in different positions.

• Understand 6 counters can be arranged as 3+3 or 2+2+2.

Year 2

Maths Check List

• Recall the 10 times table in any order

• Recall the 5 times table in any order

• Recall the 2 times table in any order

• Know o'clock, half past, quarter past and quarter to

• Be confident to name all 2D shape properties

• Have instant recall of number bonds to 20

• Accurately use a ruler to draw and measure lines of given length

• Know that division is repeated subtraction

Written Calculation

$$23 + 14 = 37$$
$$14 + 23 = 37$$
$$37 = 23 + 14$$
$$37 = 14 + 23$$

$$27 - 13 = 14$$
$$14 = 27 - 13$$
$$47 - 24 = 23$$
$$23 = 47 - 24$$

$$7 \times 5 = 35$$
$$35 = 7 \times 5$$
$$2 \times 7 = 14$$
$$14 = 7 \times 2$$

$$10 \div 5 = 2$$
$$2 = 10 \div 5$$
$$14 \div 2 = 7$$
$$7 = 14 \div 2$$

Mental Strategies

• Doubling

• Halving

• Addition of single digit to 2 digit number

• Partitioning

• Bridging

• Subtraction from multiple of 10

• Skip count 2s, 10s, 5s, 3s

• Tripling.

• Lay foundations for 3x, 4x table in thirds, quarters work

• Pupils to draw own number lines to support mental calculations as not allowed for SATs

Generalisations

• Rule when adding odd and even numbers

• Addition can be done in any order (commutative)

• Subtraction of one number from another is not commutative

• Inverse relationship between addition and subtraction and use this to check calculations and missing number problems.

• Inverse relationship between multiplication and division.

• Commutative law of arrays

Year 3

Maths Check List

- Recognise and write numbers 0 to 1,000

- Know number bonds to 100

- Recall the 3, 4 and 8 times table in any order

- Know some basic 3D shape names

- Count in fours, eights, fifties and hundreds

- Know what 10 or 100 more and less is.

- Understand the value of each digit in a 3-digit number

- Use simple graphs with axis

- Understand unit fractions

- Know about fact families

- Can add and subtract money

- Tell the time to the nearest 5 minutes

Written Calculation

$$789 + 642 = 1431$$

$$932 - 457 = 475$$

$$342 \times 7 = 2394$$

$$98 \div 7 = 14$$

$$432 \div 5 = 86 \, r \, 2$$

Mental Strategies

- Doubling

- Halving

- Partitioning (through addition of single digit to 3 digit number)

- Bridging (through addition of single digit to 3 digit number)

- Subtraction from multiple of 100

- Revise x3 through work on thirds

- Skip count 4s

- Reinforce 4x through work on quarters

- Skip count 8s

- Strategies for 9x, 11x, 12x as part of other tables (commutativity)

- Link skip counting 50s, 100s to 5s, 10s on counting stick.

Generalisations

- Noticing what happens to the digits when you count in tens and hundreds.

- Inverses and related facts – develop fluency in finding related facts involving all four operations.

- Develop the knowledge that the inverse relationship can be used as a checking method.

- Connecting x2, x4 and x8 through multiplication facts.

- Comparing times tables with the same times tables which is ten times bigger.

  (If 4 x 3 = 12, then we know 4 x 30 = 120.)

Year 4

Maths Check List

- Know vocabulary for operations

- Can double and halve

- To know up to the 12 multiplication table and identify the corresponding division facts

- Can tell the time to the nearest minute

- Understand the various denominations of UK money, can total values and work out change

- Understand the value of each digit in a 4-digit number

- Count forwards and backwards in multiples of 6, 7, 9, 25 and 1000

- Know what 1000 more and 1000 less is

- Know common fractions and equivalent fractions

- Can convert between different units of measure

- Can use rapid recall to support mental addition and subtraction

Written Calculation

$789 + 642 = 1431$

```
  789
+ 642
 1431
  1 1
```

$932 - 457 = 475$

```
  8 12 12
  9 3 2
- 4 5 7
  4 7 5
```

$342 \times 7 = 2394$

```
    342
x     7
   2394
    2 1
```

$98 \div 7 = 14$

```
    1 4
  7|9 ²8
```

$432 \div 5 = 86 \, r \, 2$

```
    0 8 6 r 2
  5|4 ⁴3 ³2
```

Mental Strategies

- Skip count 6s (teach by doubling 3s)

- Skip count 9s (Link to 3x, 6x)

- Skip count 7s (lower priority as only 7x7 can't be gained from other tables)

- Reinforce doubling

- Reinforce tables relationships through work on fractions and perimeter
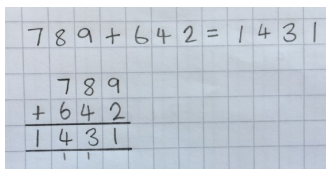
Generalisations

- Investigate re-ordering as a strategy for subtraction. Eg. $20 - 3 - 10 = 20 - 10 - 3$, but $3 - 20 - 10$ would give a different answer.

- Investigate relationship between x and ÷ (Dividing by 10 is the same as dividing by 2 and then dividing by 5.)

- Connecting x3, x6 and x9 through multiplication facts.
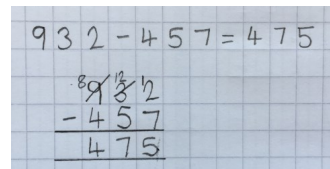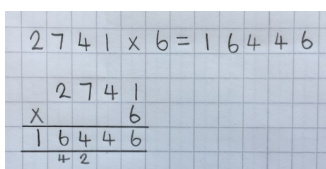
- Inverses and derived facts.
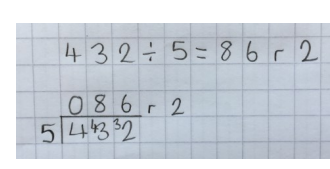
Year 5

Maths Check List

- Have a secure method for each of the four operations
- To be able to multiply numbers by 10, 100 and 1,000 and also divide by the same numbers
- Can round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000
- To count using positive and negative numbers
- Understand the relationship between fractions, decimals and percentages
- Know fractions of amounts
- Can identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers
- Knows and uses the vocabulary of prime numbers, prime factors and composite (non-prime) numbers
- Understand place value in numbers involving tenths and millions
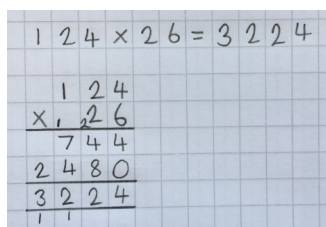- Can confidently name 2D and 3D shapes and identify their properties.

Written Calculation

$789 + 642 = 1431$ $\begin{array}{r} 789 \\ + 642 \\ \hline 1431 \end{array}$	$932 - 457 = 475$ $\begin{array}{r} 932 \\ - 457 \\ \hline 475 \end{array}$
$2741 \times 6 = 16446$ $\begin{array}{r} 2741 \\ \times \quad 6 \\ \hline 16446 \end{array}$	$432 \div 5 = 86 \, r \, 2$ $\begin{array}{r} 086 \, r \, 2 \\ 5 \overline{)432} \end{array}$
$124 \times 26 = 3224$ $\begin{array}{r} 124 \\ \times \quad 26 \\ \hline 744 \\ 2480 \\ \hline 3224 \end{array}$	

Mental Strategies

- Counting forwards and backwards in tenths and hundredths e.g. 1.7 + 0.55
- Reordering
- Bridging through multiples of 10
- Partitioning through compensating (5.7 + 3.9, 5.7 + 4.0 – 0.1)
- Using 'near' doubles: 2.5 + 2.6 is double 2.5 and add 0.1 or double 2.6 and subtract 0.1
- Strategy of double one side and halve the other when multiplying. E.g. 16 x 4 = 8 x 8
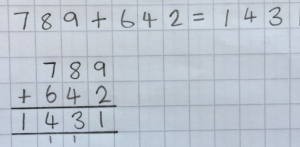
Generalisations

- Relating arrays to an understanding of square numbers and making cubes to show cube numbers.
- Understanding that the use of scaling by multiples of 10 can be used to convert between units of measure (e.g. metres to kilometres means to times by 1000)
- Sometimes, always, never true questions about multiples and divisibility.
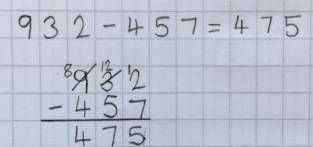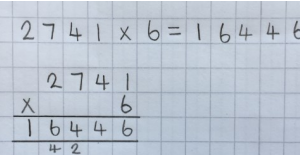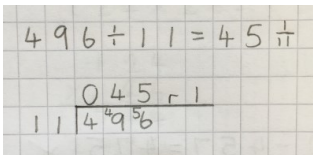
Year 6

Maths Check List—Y5 Revision

- Have a secure method for each of the four operations
- To be able to multiply numbers by 10, 100 and 1,000 and also divide by the same numbers
- Can round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000
- To count using positive and negative numbers
- Understand the relationship between fractions, decimals and percentages
- Know fractions of amounts
- Can identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers
- Knows and uses the vocabulary of prime numbers, prime factors and composite (non-prime) numbers
- Understand place value in numbers involving tenths and millions
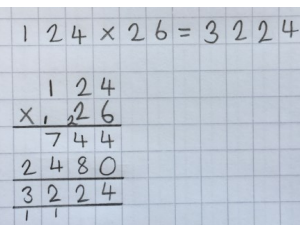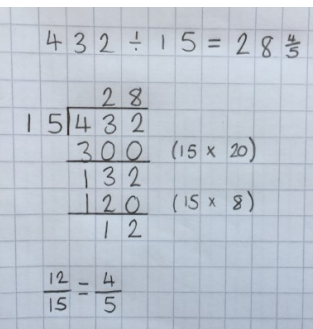- Can confidently name 2D and 3D shapes and identify their properties.

Written Calculation

Mental Strategies

- Children should experiment with order of operations (BIDMAS)
- Counting forwards and backwards in tenths and hundredths e.g. 1.7 + 0.55
- Reordering of calculations
- Bridging through multiples of 10
- Partitioning through compensating (5.7 + 3.9, 5.7 + 4.0 − 0.1)
- Using 'near' doubles: 2.5 + 2.6 is double 2.5 and add 0.1 or double 2.6 and subtract 0.1
- Strategy of double one side and halve the other when multiplying. E.g. 16 x 4 = 8 x 8

Generalisations

- Order of operations—Children could learn acrostic BIDMAS to remember the order of operations.
- Sometimes, always or never true? Subtracting numbers makes them smaller.
- Understanding the use of multiplication to support conversions between units of measurement.
- Sometimes, always, never true questions about multiples and divisibility. E.g. If a number is divisible by 3 and 4, it will also be divisible by 12.