Number

Operations and their Applications

Multiplication

Multiplication

Explore multiplication using repeated addition or equal sets array within 25. Explain the process. Use and interpret symbols.

Consolidate the concept of multiplication:

- up to 5×5;
- to include all the 2, 5, and 10 times tables. Develop quick recall.

Develop an understanding of the commutative nature of multiplication using practical materials, *eg number line, squared paper, cubes, multiplication square.*

Extend gradually the concept of multiplication to include all possibilities from 0×0 to 10×10:

- 4, 8;
- 3, 6, 9;
- remaining facts.

Multiply using mental or pencil and paper methods:

- a multiple of 10 by a single digit;
- any 2-digit/3-digit number by a single digit.

Multiplication

Have quick recall of all multiplication tables up to 10×10.

Explore and use the effect of multiplying whole numbers:

- by 10;
- by multiples of 10.

Extend multiplication to a 2-digit/3-digit number by a 2-digit number using a variety of written methods.

Understand and use the effect of multiplying whole numbers:

- by 100;
- by multiples of 100.

Investigate the effect of multiplying a number with up to two decimal places:

- by 10, 100 and 1000;
- by a single digit using various methods.

Multiplication and Division

Multiplication and Division

Use, read and begin to write the related vocabulary of multiplication and division, *eg "times", "divisible by".*

Develop mental strategies for multiplication and division.

Understand that multiplication and division are inverse operations and use to check results of calculations.

Extend understanding of the operations of "×" and "÷", and their relationship to each other and to "+" and "–".

Solve problems to include:

- choosing and using appropriate operations (including multiplication and division) to solve word problems, explaining methods and reasoning;
- choosing and using appropriate ways of calculating, *eg mental, mental with jottings, pencil and paper;*
- suggesting extensions by asking appropriate open-ended questions;
- explaining methods of calculation and reasoning about numbers orally and, where appropriate, in writing.

Share sets of objects to develop an understanding of what is meant by fractions of quantities —

whole number answers only.

Multiplication and Division

Calculate fractions:

- $\frac{1}{3}$ of, $\frac{1}{4}$ of
- $\frac{2}{3}$ of, $\frac{3}{5}$ of
- mentally/written/calculator.

Multiplication and Division

Appreciate and use the relationships between the four operations, and the principles of the arithmetic laws.

Appreciate the use of brackets.

Use the four operations to solve more complex word problems and puzzles involving numbers and measures, explaining methods and reasoning;

Share sets of objects to develop an understanding of what is meant by fractions of quantities, resulting in mixed number answers, *eg* $\frac{1}{3}$*of 10 is* $3\frac{1}{3}$.

Use mental strategies to calculate percentage quantities, eg *5% of 240 is half of 10% of 240.*

Calculate further percentage quantities, *eg 75% of 880; 90% of 50.*

Division

Division

Explore the concept of division within 25 through sharing and grouping activities:

- develop recall;
- begin recording using the division symbol

  eg given that 3 sets of 4 makes 12, how many fours are in 12?
- develop the link between multiplication and division,

Explore repeated subtraction as an approach to division:

- consider remainders in practical contexts.

Recognise whole numbers which are exactly divisible by 2, 5, and 10.

Explore the link between multiplication and division, *eg halving is the inverse of doubling.*

Division

Extend the concept of division within 100 through sharing and grouping activities:

- develop quick recall;
- use the division symbol;
- consolidate the link between multiplication and division.

Extend the concept of remainders and know when it is appropriate to round up or down.

Extend division:

- to any 2-digit/3-digit whole number by a single digit using a variety of written methods

Use the knowledge of multiplying whole numbers by 10 and 100 to explore division by 10 and 100. Recognise numbers which are exactly divisible by 10, 100.

Division

Investigate the effect of dividing a number:

- by 10, 100 and 1000;
- by a single digit using various methods leading to answers with up to two decimal places.

Select an appropriate way of expressing a remainder ie, as a fraction or decimal fraction or as a whole number remainder.