A logo with a shield and laurels

Description automatically generated**Progression in calculations for Multiplication**

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| Year 1 | Concrete | Pictorial | Abstract |
| **Learning Objective**  Solve 1 step problems with multiplication  **Note:** Children in year 1 are not expected to record multiplication in a formal way | **Doubling**  Use practical resources to show how numbers are doubled- mirror, dominoes, base 10  Hands-on Maths How to Teach Doubling Visual Games - I See Maths | Envision math, Math doubles, Creative math Double The Ladybird Spots Sheets (Minibeasts) (teacher made) | Draw pictures to show numbers are doubled  Double 4 is 8 | Partition a number, double it and then recombine. |
| **Counting in multiples of and repeated addition**  Count in multiples supprted by various concrete objects  Dice, cubes, beads, objects on circles (groups), numicon, coins | Use a numberline to support counting in multiples or in equal jumps | Extend knowledge to completing number sequence, which link to jumps on the number line  2, 4 , 6 8 , ……….. , ………  5 , 10 , 15 , ……….. , ……….. etc  Use addition sentences to communicate the relationship between pictures and abstract values |
| Year 2 | Concrete | Pictorial | Abstract |
| **Learning Objective:**  Solve 1 step problems using multiplication (arrays)  **Methods**  Arrays and groupings  **Key vocabulary**  Multiply, Multiplication  Times, Lots of  Groups of | Teach the children how to use arrays to put into context multiplication number sentences    In year 2 children should be introduced to the symbol ‘x’ | Draw arrays in different rotation and generate number facts that are the same.  Represent repeated addition and arrays as multiplication, and sharing and  repeated subtraction (grouping) as division - Mathsframe3 rows with 6  Represent repeated addition and arrays as multiplication, and sharing and  repeated subtraction (grouping) as division - Mathsframe6 rows with 3 in each | Use arrays, to communicate the answer to multiplication sentences  Represent repeated addition and arrays as multiplication, and sharing and  repeated subtraction (grouping) as division - Mathsframe  Convey an array in a variety of different ways  **6 + 6 + 6 =**  **3 + 3+ 3+ 3+ 3+ 3 =**  **3 x 6 =**  **6 x 3 =** |
| Year 3 | Concrete | Pictorial | Abstract |
| **Learning Objective:**  Multiply 2 digit number by a single digit  **Methods**  Dienes, pv counters  **Key. Vocabulary**  Multiply, Multiplication  Times, Lots of  Groups of | Show the link with arrays to introduce the grid methods for multiplication for lower numbers under 100 | Once the understanding has been consolidated through concrete, children should now formalise their ideas, using number values instead of place value columns.  Singapore math - Wikipedia | Children can start their formal method which follows this journey. The final outcome would be the use of the grid method, where counters are now substituted with values.  This process does rely on children knowing their multiplication facts and being able to multiply by a multiply of 10.  Birchley St Mary's RC Primary School: Combination Chaos |
| Year 4 | Concrete | Pictorial | Abstract |
| **Learning Objective:**  To multiply a two/three-digit number by a single digit  **Methods**  Expanded column method  **Key vocabulary**  Times, multiply  Multiplication, product | When multiplying larger values, you will need to revert back to place value counters.  **4 x 126 =** | Singapore math - Wikipedia    Bar modelling and grids work well in communicating what it is you are trying to work out- visual aid | This method is only to be used when multiplying by a single digit  . |
| Year 5 and 6 | Concrete | Pictorial | Abstract |
| **Learning Objectives**  Multiply 3/4 digits by a single digit  **Learning Objectives**  Multiply a 2/3/4 digit by 2 digits  **Key vocabulary**  Times, multiply  Multiplication, product | Most children should be secure with the formal written method, but this concrete approach is a great way of allowing children to develop vocabulary, when they are explaining. Use it alongside written methods  E.g. | Singapore math - Wikipedia | By years 5 and 6, children should be using the contracted, formal written method. |

**Progression in calculations for Division**

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| Year 1 | Concrete | Pictorial | Abstract |
| **Learning Objective:**  Solve 1 step problems with division(sharing/grouping)  **Methods**  Real life objects  Cubes  Numicon,counters  **Key vocabulary** |  | Children use pictures or shapes to share quantities. | Share 9 buns between three people.  9 ÷ 3 = 3 |
| Year 2 | Concrete | Pictorial | Abstract |
| **Learning Objective:**  Solve 1 step problems with division(sharing/grouping)  **Methods**  Base 10, number beads, real life objects, arrays  **Key vocabulary** | Divide quantities into equal groups.  Use cubes, counters, objects or place value counters to aid understanding. | Link division to arrays as previously practiced during multiplication    Think of the bar as a whole. Split it into the number of groups you are dividing by and work out how many would be within each group. | 28 ÷ 7 = 4  Divide 28 into 7 groups. How many are in each group? |
| Year 3 | Concrete | Pictorial | Abstract |
| **Learning Objective:**  Divide 2 digits by 1 digit  **Methods**  Base 10, bar models  Part-whole models  **Key. Vocabulary** | 12 ÷ 3 =  Divide objects between groups and see how many belong to each group | Draw an array and use lines to split the array into groups to make multiplication and division sentences. | Find the inverse of multiplication and division sentences by creating four linking number sentences.  7 x 4 = 28  4 x 7 = 28  28 ÷ 7 = 4  28 ÷ 4 = 7 |
| Year 4 | Concrete | Pictorial | Abstract |
| **Learning Objective:**  Divide 2 digits (sharing with an exchange)  **Methods**  Base 10, bar models  Part-whole models  **Key vocabulary** | Start out with equipment on a place value grid, to fully embed the concept that each person receives an equal amount. Extend this to remainders. | This method will work with numbers to 50 but move to the concept of bar modelling, with larger numbers. | http://amsi.org.au/teacher_modules/G7/G7_qt2%202.pngComplete written divisions and show the remainder using r.  If children have grasped the concept of division, then progress them onto the bus shelter. Use this alongside the concrete and pictorial.  . |
| Year 5 and 6 | Concrete | Pictorial | Abstract |
| **Learning Objectives**  **Division of a 3/4 digit number by a single digit**  **Learning Objectives(Yr6)**  Division of a 3/4 digit number by a two digit number  **Key vocabulary** | Place value counters can be used alongside the bus shelter, to support children’s understanding of the mechanics of division | **Visual hook**  Use the bar model as a method to support children’s understanding of worded problems. It is a way for children/teachers to communicate visually, what it is they are trying to work out. It builds on the idea of fractions and equal parts, as communicated by fractions | Begin with divisions that divide equally with no remainder.    Move onto divisions with a remainder.    When dividing with money, ensure that the children can change the monetary amount into a decimal with 2 decimal places.  £ 34 becomes £ 34. 00, before dividing  In Year 6, GDS children challenged to using long division to support with division by a two digit number  Formal Long Division (1) Worksheet - EdPlace |