CALCULATION POLICY: Division
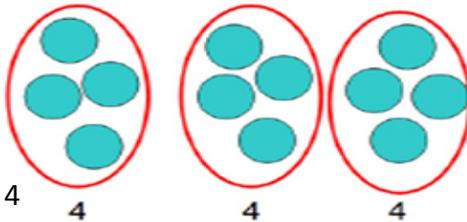
Stage 1

Group and share small quantities.

Use objects, diagrams and pictorial representations to solve problems involving BOTH grouping and sharing

How many groups of 4 can be made with 12 stars?

Grouping:

Sharing:

12 shared between 3 is 4

Vocabulary: half, share, share equally, one each, two each, three each... group in

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National Curriculum Learning Objectives:

Pupils should be taught to:

▪ recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers

▪ calculate mathematical statements for multiplication and division within the multiplication tables

▪ show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot

▪ Find half of a group of objects by sharing into 2 equal groups

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Stage 2

Children will start with **sharing.**

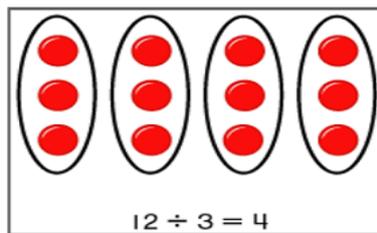Share 20 crayons between 2 pots. How many crayons are in each pot?

They will then move on to **grouping.**

Put 20 crayons into pots of 10. How many pots will we need?

Arrays:

$12 \div 3 = 4$

This represents $12 \div 3$, posed as how many groups of 3 are in 12?

Pupils should also show that the same array can represent $12 \div 4 = 3$ if grouped horizontally.

Vocabulary: share, share equally, one each, two each, three each… group in twos, threes… tens, equal groups of, divide, division, divided by, divided into, left over, halve, arrays, jumps, repeated subtraction.

National Curriculum Learning Objectives

Pupils should be taught to:

- recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables
- write and calculate mathematical statements for multiplication and division using the multiplication tables and write them using the x, ÷ and = signs
- show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot
- solve problems involving numtiplication and division, using materials, arrays, repeated addition, mental methods and multiplication and division facts, including problems in contexts
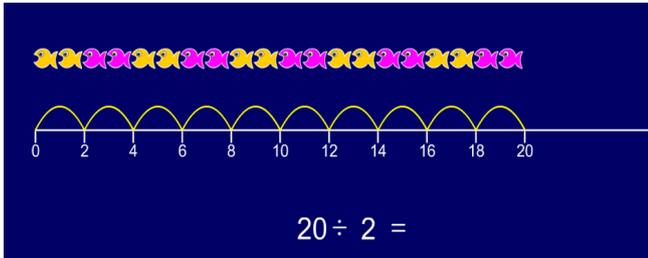
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Stage 3

Children are taught to use **grouping**

How many groups of 2 in 20?

$20 \div 2 =$

Children will start to find remainders mentally

$16 \div 5 = 3 \text{ r } 1$

Children also begin to solve division word problems where the remainder needs to be rounded:

E.g. There are 18 children in a class. A table can fit 5 children on. How many tables will they need?

$18 \div 5 = 3 \text{ r } 3$

So they will need 4 tables

Vocabulary: share, share equally, one each, two each, three each… group in twos, threes… tens, equal groups of, divide, division, divided by, divided into, left over, remainder, halve, arrays, jumps, repeated subtraction.

National Curriculum Learning Objectives

Pupils should be taught to:

- recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables
- write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods
- solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.

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Stage 4

Children begin to use the 'bus stop' method. They use their knowledge of remainders from Stage 3 to carry remainders within the calculation. Towards the end of Stage 4 they write remainders as fractions.

98 ÷ 7 becomes	432 ÷ 5 becomes	496 ÷ 11 becomes
$\begin{array}{r} 1\ 4 \\ \hline 7\ |\ 9\ ^2 8 \end{array}$	$\begin{array}{r} 8\ 6\ r\,2 \\ \hline 5\ |\ 4\ 3\ ^3 2 \end{array}$	$\begin{array}{r} 4\ 5\ r\,1 \\ \hline 11\ |\ 4\ 9\ ^5 6 \end{array}$
Answer: 14	Answer: 86 remainder 2	Answer: $45\frac{1}{11}$

Vocabulary: halve, share, share equally, one each, two each, three each… group in pairs, threes… tens, equal groups of, divide, division, divided by, divided into, remainder, factor, quotient, divisible by, inverse, halve, fact families, chunking

National Curriculum Learning Objectives

Pupils should be taught to:

- recall multiplication and division facts for multiplication tables up to 12 × 12
- use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers
- recognise and use factor pairs and commutativity in mental calculations
- multiply two-digit and three-digit numbers by a one-digit number using formal written layout
- solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.

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Stage 5

Children continue to develop the 'bus stop' method as set out in Stage 4. They begin to express remainders as both fractions and decimals

$$0\ 3\ 5 \cdot 5$$
$$4\overline{)1\ ^14\ ^22 \cdot ^20}$$

The 'Chunking' method is used to introduce division by a 2 digit number:

$$23\,r\,4$$
$$24\overline{)556}$$
$$\underline{-480} \quad 24 \times 20$$
$$76$$
$$\underline{-72} \quad 24 \times 3$$
$$4$$

Division using partitioning (two digits divided by one digit):

65 ÷ 5 = 13

65 = 50 + 15 Partition 65 into 50 and 15
50 ÷ 5 = 10
15 ÷ 5 = 3
10 + 3 = 13

NB Children will need to practise partitioning in a variety of ways.

Chunking method develops to:
432 ÷ 15 becomes

```
          2  8 · 8
   1  5 | 4  3  2 · 0
          3  0 ↓
          1  3  2
          1  2  0  ↓
             1  2  0
             1  2  0
                   0
```

Answer: 28·8

Vocabulary: halve, share, share equally one each, two each, three each...group in pairs, threes... tens equal groups of divide, divided by divided into, divisible by remainder factor quotient divisible by inverse

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National Curriculum Learning Objectives

Pupils should be taught to:

- identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers

- know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers

- establish whether a number up to 100 is prime and recall prime numbers up to 19

- multiply numbers up to 4 digits by a one or two-digit number using a formal written method, including long multiplication for two-digit numbers

- multiply and divide numbers mentally drawing upon known facts

- divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context

- multiply and divide whole numbers and those involving decimals by 10, 100 and 1000

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Stage 6

Children continue to use written method for long division.

They apply methods to problem solving and decide whether to round a remainder up or down in a real life context.

$432 \div 15$ becomes

```
            2   8
    1   5 | 4   3   2
            3   0   0    15×20
            1   3   2
            1   2   0    15×8
                    1   2
```

$$\frac{12}{15} = \frac{4}{5}$$

Answer: $28\frac{4}{5}$

$432 \div 15$ becomes

```
            2   8 · 8
    1   5 | 4   3   2 · 0
            3   0
            1   3   2
            1   2   0
                1   2   0
                1   2   0
                        0
```

Answer: 28·8

```
        0.38
    9 ) 3.42
       -27
         72
        -72
          0
```

National Curriculum Learning Objectives

Pupils should be taught to:

▪ multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication

▪ divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context

▪ divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context

▪ perform mental calculations, including with mixed operations and large numbers

▪ identify common factors, common multiples and prime numbers

▪ use their knowledge of the order of operations to carry out calculations involving the four operations

▪ solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why