DIVISION

Group & share small quantities.
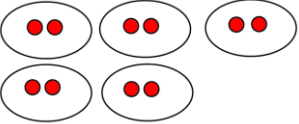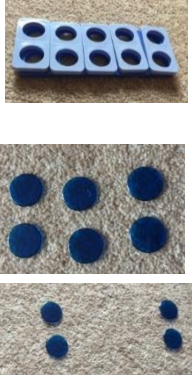
Using objects, diagrams and pictorial representations to solve one-step problems.

To use both **grouping** and **sharing** methods within problem solving.

Key Vocab:

Share, share equally, one each, two each..., group, groups of, lots of.

	Concrete	Pictorial	Abstract
Sharing	Sharing 10 into 5 groups.	Model the concrete using pictures, showing how we can share the sweets.	I have 10 sweets to share between 5 children, how many sweets does each child get? $10 \div 5 = 2$
Grouping	How many groups of 2 are there in 10? How many groups of 2 can we make from 6?	This is starting to look like an array and links more closely to number line methods. How many groups of 2 can I make from 10?	I have 10 sweets and give 2 to each child, how many children get sweets? $10 \div 2 = 5$

Children should

- Have access to a range of equipment such as numicon, number lines, bead strings, 100 squares, cubes & counters.

- Have opportunities to group and share using concrete objects in a range of real life contexts.

- Be exposed to a variety of models and images to support their learning.

- Read and write number sentences using the ÷ and = signs.

- Understand the = as "**equals**" or "**balanced**" and not as "the answer".

- Solve one step problems.

DIVISION

Year 2
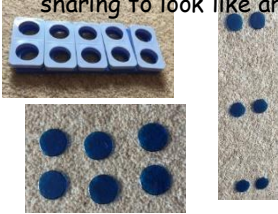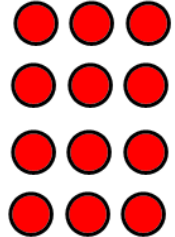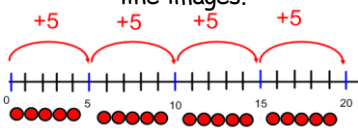
Group and share, using the ÷ sign .

Use objects for grouping & sharing—begin to organise these into arrays & support with pictorial images.

Model the use of repeated addition on a number line.

	Concrete	Pictorial	Abstract
Arrays	Continue to use objects for grouping and sharing as in Year 1. Begin to organise groups or sets of objects when grouping & sharing to look like arrays.	Children begin to draw their own arrays to solve problems. 12 ÷ 3 = 4 12 ÷ 4 = 3	Use of ÷ symbol in recording as number sentences. 12 ÷ 3 = 4 12 ÷ 4 = 3
Number lines	Use bead strings or counters to model division as 'counting up in groups of'.	Demonstrate this using number line images.	As above.

Children should

- Have further opportunities to use objects to solve division problems with increasing independence.

- Begin to organise objects into arrays or as a number line.

- Represent number sentences as arrays & on pre-drawn and self-drawn number lines.

- Begin to use counting and times table facts to solve problems mentally. (2x, 5x and 10x).

- Have experience of applying these methods to a range of different contexts including worded multiplication problems & missing number problems.

- Understand that the commutative law does not apply to division and that it cannot be done in any order.

- Understand that multiplication and division are inverse operations and use related division facts to develop understanding.

- Have experience of division where there is something 'left over' (a remainder).
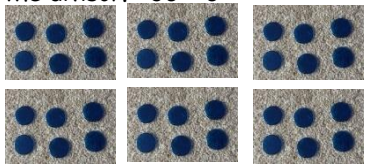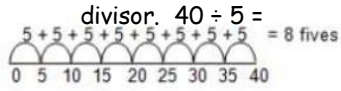
DIVISION

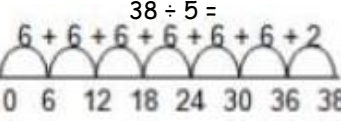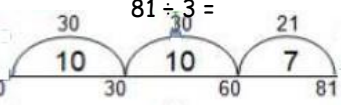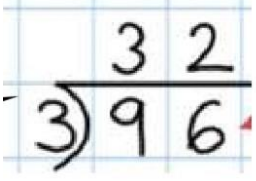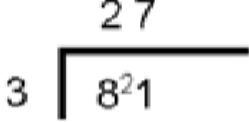**Divide 2-digit numbers by a single digit.**

Calculate answers to division problems using times table facts.

Key Vocab:

Share, share equally, one each, two each..., group, groups of, lots of, divide, divided by, array, divided into, division, grouping, sharing, number line, left, left over. Inverse, short division, 'carry', remainder, multiple.

	Concrete	Pictorial	Abstract
Short division method	Use counters, numicon or dienes to model counting on in groups of the divisor. $36 \div 6 =$	Using a number line to show counting on in groups of the divisor. $40 \div 5 =$ $5 + 5 + 5 + 5 + 5 + 5 + 5 + 5$ = 8 fives $0\ 5\ 10\ 15\ 20\ 25\ 30\ 35\ 40$ Using examples which include a remainder. $38 \div 5 =$ $6 + 6 + 6 + 6 + 6 + 6 + 2$ $0\ 6\ 12\ 18\ 24\ 30\ 36\ 38$ When it becomes inefficient to count in single multiples, bigger jumps can be recorded using known facts. $81 \div 3 =$ $30\quad 30\quad 21$ $10\quad 10\quad 7$ $0\quad 30\quad 60\quad 81$	Start by using examples with no carrying. $$3)\overline{9\ 6} \to 3\ 2$$ Move to multiples of the divisor where carrying of one or more tens is needed. $$3\ )\ 8^2 1 \to 2\ 7$$ Model examples with whole number remainders. Refer back to practical apparatus to examine what this means.

Children should

- Have experience of applying these methods to a range of different contexts including worded multiplication problems & missing number problems.

- Understand the relationship between multiplication and division.

- Recall multiplication & division facts for 2x, 3x, 4x, 5x, 8x and 10x and use these to solve problems mentally.

- Be able to relate multiplication and division facts.
  Eg $12 \div 3 = 4$, $12 \div 4 = 3$, $3 \times 4 = 12$, $4 \times 3 = 12$.

  $4 \times 12 \times 5 = 4 \times 5 \times 12 = 20 \times 12 = 240$

- Solve scaling & correspondence problems eg. If $20 \div 4 = 5$ then $200 \div 4 = 50$.
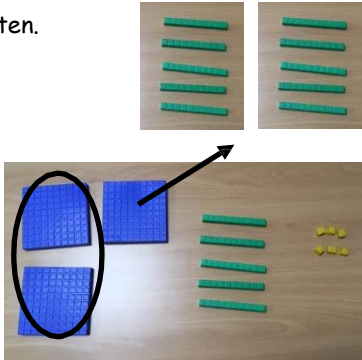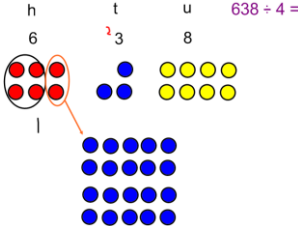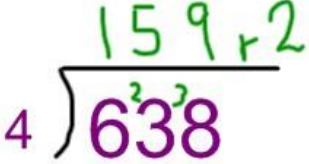
DIVISION

Dividing 3 and 4 digit numbers by a single digit number using short division.

Year 4

Key Vocab:

Share, share equally, one each, two each..., group, groups of, lots of, divide, divided by, array, divided into, division, grouping, sharing, number line, left, left over, inverse, short division, 'carry', remainder, multiple. **Divisible by, factor.**

	Concrete	Pictorial	Abstract
Short division method	Using dienes to start discussing the division of 3 digit numbers by a single digit. How many 2s in 3 hundred? There is one lot of two and one left over, so we split that hundred up into ten lots of ten, then look at how many 2s in 15 lots of ten.	Model in picture form using representations of dienes or place value counters (as below). Demonstrate the need to exchange eg in this example, we would have two exchange the two "left over" hundreds for twenty lots of ten. 638 ÷ 4 =	159 r2 4)638

Children should

- Approximate before they calculate (make this a regular part of calculation) & refer back to their approximation as part of the checking process.

- Use place value multiplication to multiply and divide by 10 and 100 and recognise that 150 could be made by 3 x 50 or 30 x 5.

- Recall all times table & division facts.

- Apply written methods to a range of contexts including money & measures and multi-step problems.

- Begin to discuss the relevance of a remainder in context. Eg. If 1 slice of cake is "left over" as a remainder, we could share that slice using fractions;

- Develop mental division skills including understanding the effect of dividing by 0 and dividing by 1.

DIVISION

Year 5-6

Year 5: Short division- up to 4 digits by a 1 digit number including remainders.

Year 6- Short division. Long division with place value counters, up to 4 digits by a 2 digit number. Children should exchange into the tenths and hundredths column too. Dividing decimals by integers and fractions by integers.

Key Vocab:

Share, share equally, one each, two each…, group, groups of, lots of, divide, divided by, array, divided into, division, grouping, sharing, number line, left, left over, inverse, short division, 'carry', remainder, multiple. Divisible by, factor.

	Concrete	Pictorial	Abstract
Short division method	Short division using place value counters to group. 615 ÷ 5 100s / 10s / 1s 1 2 3 1. Make 615 with place value counters. 2. How many groups of 5 hundreds can you make with 6 hundred counters? 3. Exchange 1 hundred for 10 tens. 4. How many groups of 5 tens can you make with 11 ten counters? 5. Exchange 1 ten for 10 ones. 6. How many groups of 5 ones can you make with 15 ones?	Represent the place value counters pictorially. 100s / 10s / 1s 1 2 3	$$5\overline{)6^{1}1^{1}5} = 123$$ 2544 ÷ 12 = ☐ 12 = 6 × 2 $2\overline{)2544} = 1272$ 212 $6\overline{)1^{1}2^{1}7^{1}2}$ 2544 ÷ 12 = 212 $12\overline{)2^{2}5^{1}4^{2}4} = 212$ 12 × 1 24 × 2 48 × 4 96 × 8 Use these related number facts to divide.

Long Division

$$15\overline{)3640}$$

$$15\overline{)3640}$$
  2
-30
  6

15 into 3 doesn't go, so look at the next digit.
15 goes into 36 two times, so put a 2 above the 6.
15 × 2 = 30

Take that 30 away from the 36 to get your remainder.
36 - 30 = 6

$$15\overline{)3640}$$
  24
-30
  64
- 60
   4

Next, carry the 4 down to make 64.
15 goes into 64 four times, so put a 4 above the 4.
15 × 4 = 60

Take 60 from the 64 to get your remainder.
64 - 60 = 4

$$15\overline{)3640}$$
  242
- 30
  64
- 60
   40
- 30
   10

Carry the 0 down to make 40.
15 goes into 40 two times, so put a 2 above the 0.
15 × 2 = 30

Take 30 from the 40 to get your remainder.
40 - 30 = 10