Calculation policy – Division in Curriculum 2014

Progression of methods across the school

The following calculation policy has been devised to meet the requirements of the National curriculum 2014 for the teaching and learning of mathematics, and is designed to ensure a smooth and consistent, yet rapid progression of learning calculations across the school.

Guidance for use of the policy

- The following standards are what we would expect most children to achieve.
- Children achieving below the standards, for example children with S.E.N, will need to be given the method most appropriate for their level of achievement.
- Children achieving the expected standards in calculation will be provided with more opportunities to apply their calculations, at their age-related level, in more challenging contexts and problems.

A context for calculation

- Calculations should be given a real-life context.

Children should be encouraged to:

- **Approximate their answers before calculating.**
- **Check their answers after calculation using an appropriate strategy.**
- **Consider if a mental calculation would be appropriate before using written methods.**
- **Develop mental fluency and an understanding of problem solving.**
- **Use reasoning skills**
- **Use manipulatives or visualisation where appropriate**

Using division facts - tables knowledge

Year 2	2 times table 5 times table 10 times table	(plus inverse operations)
Year 3	3 times table 4 times table 8 times table	(plus inverse operations)

Year 4 Derive and recall division facts for all tables up to 12 x 12 (plus inverse)

Year 5 & 6 Derive and recall quickly division facts for all tables up to 12 x 12 (plus inverse)

Some useful information

Using and applying division facts
Children should be able to utilise their tables knowledge to derive other facts.
e.g. If I know 21 ÷ 7 = 3, what else do I know? 210 ÷ 7 =30, 201 ÷ 70 = 3, etc.

Dividing by 10 or 100
Knowing that the effect of dividing by 10 is a shift in the digits one place to the right.
Knowing that the effect of dividing by 100 is a shift in the digits two places to the right.

Use of factors

378 ÷ 21	378 ÷ 3 = 126 126 ÷ 7 = 18	378 ÷ 21 = 18

Use related facts

Given that 1.4 x 1.1 = 1.54
What is 1.54 ÷ 1.4, or 1.54 ÷ 1.1?

MANY MENTAL CALCULATION STRATEGIES WILL CONTINUE TO BE USED. THEY ARE NOT REPLACED BY WRITTEN METHODS.

Foundation and Y1

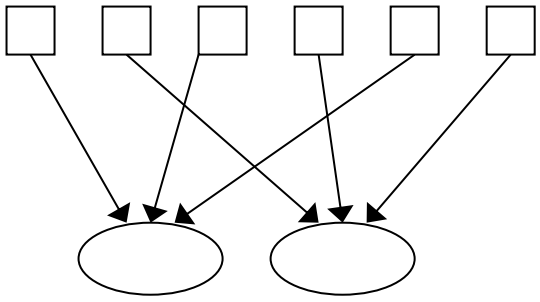
Children will understand equal groups and share items out in play and problem solving. They will share objects to see that the total is still the same and be encouraged to develop their own methods for sharing resources through real life situations.
Children will solve 1-step problems by calculating the answer using concrete objects, pictorial representations and arrays, with the support of the teacher.

Y2

Children should calculate mathematical statements for division within the target times-tables and write them using the correct signs, in number sentences.
Know that division cannot be done in any order (It is not commutative like multiplication.)
Solve problems using a wide variety of resources and materials including arrays, counters and division facts.
Children will develop their understanding of division and use jottings to support calculation

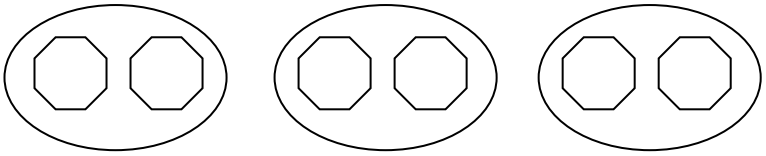
- ✓ **Sharing equally**

6 sweets shared between 2 people, how many do they each get?



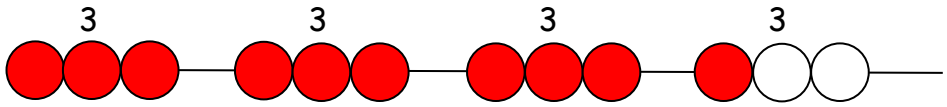
- ✓ **Grouping or repeated addition**

There are 6 sweets, how many people can have 2 sweets each?



✓ **Repeated addition using a number line or bead bar**

12 ÷ 4 =



The bead bar will help children with interpreting division as sharing in answering calculations such as 10 ÷ 5 as 'how many 5s make 10?'

✓ **Using symbols to stand for unknown numbers to complete equations using inverse operations**

□ ÷ 2 = 4 20 ÷ △ = 4 □ ÷ △ = 4

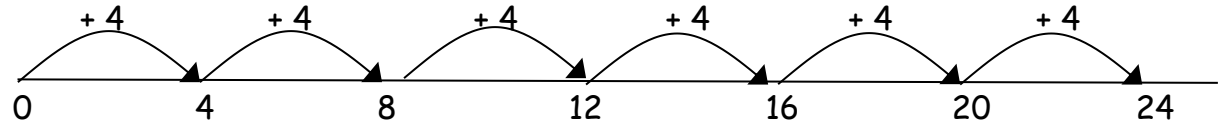
Y3

Children divide 2-digit numbers by a single digit, with no remainders.
Ensure that the emphasis in Y3 is on grouping rather than sharing.
Children will continue to use:

- ✓ **Grouping using a number line**

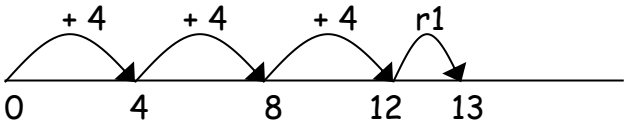
Children will use an empty number line to support their calculation.

24 ÷ 4 = 6



Children should also move onto calculations involving remainders.

13 ÷ 4 = 3 r 1



Short division TU ÷ U (with no remainders within or in answer)

96 ÷ 3

$$\begin{array}{r} 3\ 2 \\ 3\overline{)\ 9\ 6} \end{array}$$

Then progress to:

Short division TU ÷ U (with remainders within but not in answer)

96 ÷ 4

$$\begin{array}{r} 1\ 4 \\ 4\overline{)\ 8^{1}6} \end{array}$$

- ✓ **Using symbols to stand for unknown numbers to complete equations using inverse operations**

26 ÷ 2 = □ 24 ÷ n = 12 a ÷ 10 = 8

Y4

Children divide up to three-digit numbers by a single digit.

Short division TU ÷ U (with remainders within but not in answer)

96 ÷ 4

$$4\overline{)\,9^{1}6}\quad 2\,4$$

Then progress to:

Short division TU ÷ U
(with remainders in the answer)

86 ÷ 6

$$6\overline{)\,8^{2}6}\quad 1\;4\text{ r }2$$

4 ↓

Answer : 14 remainder 2

(Or with multiple remainders internally)

185 ÷ 5

$$5\overline{)\,1\;{}^{1}8\;{}^{3}5}\quad 0\;\;3\;\;7$$

Any remainders should be shown as integers, i.e. 14 remainder 2 or 14 r 2.

Children need to be able to decide what to do after division and round up or down accordingly. They should make sensible decisions about rounding up or down after division. For example 62 ÷ 8 is 7 remainder 6, but whether the answer should be rounded up to 8 or rounded down to 7 depends on the context.

e.g. I have 62p. Sweets are 8p each. How many can I buy?
Answer: 7 (the remaining 6p is not enough to buy another sweet)

Apples are packed into boxes of 8. There are 62 apples. How many boxes are needed?
Answer: 8 (the remaining 6 apples still need to be placed into a box)

Y5

Children will divide up to 4 digits by a single digit, including those with remainders.

Short division HTU ÷ U

196 ÷ 6

$$6\overline{)\,1^{1}9^{1}6}\quad 3\,2\ r\ 4$$

Answer : 32 remainder 4 or 32 r 4

Any remainders should be shown as integers, i.e. 14 remainder 2 or 14 r 2.

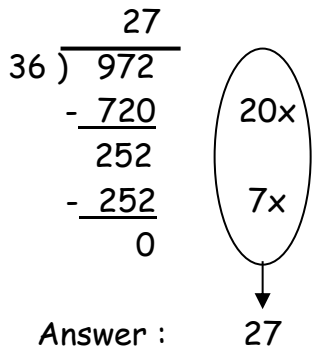
Children need to be able to decide what to do after division and round up or down accordingly. They should make sensible decisions about rounding up or down after division. For example 240 ÷ 52 is 4 remainder 32, but whether the answer should be rounded up to 5 or rounded down to 4 depends on the context.

Y6

Children will continue to use written methods to solve short division TU ÷ U and HTU ÷ U and will use this method to solve ThHTU ÷ U.
In addition, children will divide at least 4 digits by a two digit number. E.g. ThHTU ÷ TU

Long division HTU ÷ TU

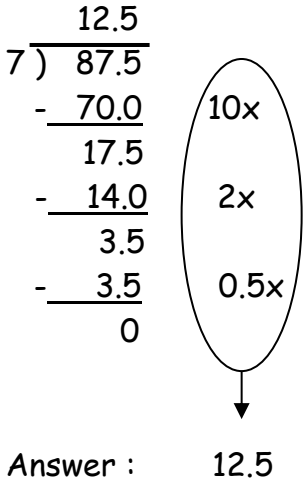
972 ÷ 36



Any remainders should be shown as fractions, i.e. if the children were dividing 32 by 10, the answer should be shown as $3\ ^{2}/_{10}$ which could then be written as $3\ ^{1}/_{5}$ in it's lowest terms.

Extend to decimals with up to two decimal places. Children should know that decimal points line up under each other.

87.5 ÷ 7



By the end of Year 6, children will have a range of calculation methods, mental and written. Selection will depend upon the numbers involved.
Children should not be made to go onto the next stage if:

1) **they are not ready.**
2) **they are not confident.**