National Curriculum Programme of Study;

- 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

Y5

Division

BY THE END OF YEAR 5…

By the end of Year 5, children will be able to show their understanding as:

Divide 4 digit number by 1 digit with appropriate remainder (fraction)

$$\begin{array}{r|llll} & 0 & 8 & 6 & 4 \quad {}^{1}/_{5} \\ \hline 5 & 4 & {}^{4}3 & {}^{3}2 & {}^{2}1 \end{array}$$

Consolidate understanding of short division with remainders

Following on from Year 4, children should be given the opportunity to consolidate their understanding of the formal short division method for division, expressing remainders as whole numbers. Ensure examples are given in context, where children are required to decide whether the remainder shoud be left, or the answer rounded up or down.

$$\begin{array}{r|llll} & 0 & 8 & 6 & 4 \quad r.1 \\ \hline 5 & 4 & {}^{4}3 & {}^{3}2 & {}^{2}1 \end{array}$$

Expressing remainders as fractions

Present the children with a simple division calculation, such as 13 ÷ 3. Ask them to estimate the answer. *Which two whole numbers will the answer fall between? How do you know?*

Draw in the boundary line and share the single place value counters between the three rows. Discuss the answer as 4 remainder 1. Now provie a context for the question; e.g. 13 cakes are shared equally among three children. How much cake will they each receive? *Is the answer '4 remainder 1' still appropriate? What would the children do with the last remaining cake?*

Explain that the remaining cake would be cut and shared equally among the three children, giving them an additional ${}^{1}/_{3}$ of a cake each. So the answer would be 4 and ${}^{1}/_{3}$. Relate this to potentially splitting the final place value counter into three equal parts and sharing between the three rows.
Alternatively, focusing on the groups (columns) of three counters, the remaining counter is one out of the next group of three, resulting in 4 and ${}^{1}/_{3}$ groups of 3 in 13.

Expressing remainders as decimals

For those division calculations where the fraction remainders are familiar to the children, they can be expressed as a decimal. Initially this should be introduced in context; through money or measures.

E.g. £1389 ÷ 4

1389 ÷ 4 = 347 remainder 1

$$\begin{array}{r|l} & 0\quad 3\quad 4\quad 7\quad \text{r.1} \\ \hline 4 & 1\quad {}^{1}3\quad {}^{1}8\quad {}^{2}9 \end{array}$$

1389 ÷ 4 = 347 $^{1}/_{4}$

The remainder of 1 needs to be shred between 4, resulting in an extra $^{1}/_{4}$ each.
Alternatively the remainder of 1 is 1 out of the next group of 4, so only $^{1}/_{4}$ of the next group can be made.

$$\begin{array}{r|l} & 0\quad 3\quad 4\quad 7\quad {}^{1}/_{4} \\ \hline 4 & 1\quad {}^{1}3\quad {}^{1}8\quad {}^{2}9 \end{array}$$

£1389 ÷ 4 = £347.25

Familiar fractions such as $^{1}/_{4}$ can be converted to decimal remainders to fit the money context.

$$\begin{array}{r|l} & 0\quad 3\quad 4\quad 7\,.\,2\quad 5 \\ \hline 4 & 1\quad {}^{1}3\quad {}^{1}8\quad {}^{2}9 \end{array}$$