



**SOUTHWICK C E PRIMARY SCHOOL
CALCULATION POLICY**

Division

Reception Year

- Division is based on the concept of sharing. Reception age learners are encouraged to share in all sorts of situations.

Year 1

- Children learn about halving: 'What is half of these 6 eggs?', 'How much is half of 10p?'
- They use practical apparatus and coins and record in pictures: 'How many pairs will these 12 socks make?', 'Share these 15 pencils equally between 5 pots.'

Year 2

- Learners continue to use practical apparatus and coins, plus pictures to record: 'Place 14 dots equally on both sides of this ladybird':



“ There are seven dots on each side so half of 14 is 7. ”

'How could you share 20p between 4 people?':

“ 5p + 5p + 5p + 5p is 20p... ”



“ ...so 20p divided by 4 is 5p. ”

- Solve simple division problems by repeated subtraction using counters:

$$12 - 2 - 2 - 2 - 2 - 2 - 2 = 0$$

“ I was able to take away 6 lots of 2, so... ”

$$12 \div 2 = 6$$

- Learners record repeated jumps backwards on a number line:



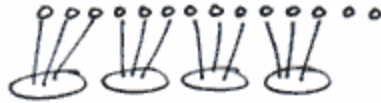
“ 6 hops of 2 from 12 back to 0, so the answer is 6. ”

Year 3

- Children begin to recognise that finding fractions of quantities involves

“ $\frac{1}{4}$ of 20p is $20p \div 4$ ”

- Learners use counters and number lines to solve division problems (perhaps involving a remainder): 'How many teams of 3 can be made with 14 people?'



“ 4 groups of 3 with 2 left over, so the answer is 4 full teams. ”

- The link between multiplication and division facts is made and emphasised: 'For every known multiplication ('times table') fact there are three 'free gifts':

“ I know that:

$$7 \times 6 = 42$$

...so I also know that:

$$6 \times 7 = 42$$

$$42 \div 6 = 7$$

$$42 \div 7 = 6$$

No problem! ”

Year 4

- Children use known tables facts to partition (split up) numbers to divide:

“ I can partition the big number into 2 smaller ones that I can handle... ”

$$\begin{array}{c}
 64 \div 4 \\
 \swarrow \quad \searrow \\
 40 \div 4 \quad 24 \div 4 \\
 \downarrow \quad \quad \downarrow \\
 10 \quad \quad 6 \\
 \underbrace{\hspace{1.5cm}} \\
 16
 \end{array}$$

(The style of recording this is not important: it's the ability to use known facts skillfully that is being encouraged.)

- The idea of 'chunking' is introduced: rather than hop backwards one step each time it is more efficient to jump back in larger, known, 'chunks':

“ I'll not subtract 4 at a time... I know 10 lots of 4 is 40... When I take that away I'm left with 24... I recognise 24! It's 6 lots of 4... take that away and there's nothing left... So the answer is 16 lots of 4 and no remainder. ”

$$\begin{array}{r}
 64 \\
 - 40 \quad (4 \times 10) \\
 \hline
 24 \\
 - 24 \quad (4 \times 6) \\
 \hline
 0
 \end{array}$$

- The relationship between multiplication and division facts ('times tables') continues to be emphasised.

Year 5

- Learners extend the use of chunking and record vertically. They take away multiples of what they're dividing by (chunks). These successive subtractions are recorded in columns. It's important to line things up

“Subtracting 6 at a time will take ages: I'll take off ten 6's, I know that's 60.

$$\begin{array}{r}
 32 \text{ r } 4 \\
 6 \overline{)196} \\
 \underline{-60} \quad (6 \times 10) \\
 136 \\
 \underline{-60} \quad (6 \times 10) \\
 76 \\
 \underline{-60} \quad (6 \times 10) \\
 16 \\
 \underline{-12} \quad (6 \times 2) \\
 4
 \end{array}$$

I took away 10 sixes, 10 sixes, 10 sixes again, then 2 sixes: that's 32 sixes in total. There were 4 left over, which is the remainder.
 Answer?
 32 remainder 4, which I write at the top.”

- Children are taught to estimate the answer beforehand to check if a calculated answer is likely:

“196 divided by 6?
 Because I know 6×3 is 18 I can see that $6 \times 30 = 180$.
 180 is not far off 196 so I expect an answer that's a bit bigger than 30.”

- Secure understanding of place value and recognition of patterns extends learners' knowledge effectively:

$$\begin{array}{l}
 32 \div 8 = 4 \\
 320 \div 80 = 4 \quad 320 \div 8 = 40 \\
 3200 \div 800 = 4 \quad 3200 \div 80 = 40
 \end{array}$$

Year 6

- With good 'times table' knowledge and an understanding of place value children can take away bigger chunks:

“ 6×3 is 18, so 6×30 is 180... I'll take that off in one go...

$$\begin{array}{r}
 32 \text{ r } 4 \\
 6 \overline{)196} \\
 \underline{-180} \quad (6 \times 30) \\
 16 \\
 \underline{-12} \quad (6 \times 2) \\
 4
 \end{array}$$

30 sixes and 2 sixes with 4 left over: the answer is 32 r 4.”

- An abbreviated method is used in upper Key Stage 2 (Y5 and Y6) (this is likely to be more familiar to parents). This method 'forgets' about the value of the digits. You 'work along' the starting number a column at a time. Everything must line up accurately, or an error is almost inevitable:

$$\begin{array}{r}
 32 \text{ r}4 \\
 \hline
 6 \overline{)196} \\
 \underline{18} \\
 16 \\
 \underline{12} \\
 4
 \end{array}$$

This can be abbreviated even further:

$$\begin{array}{r}
 32 \text{ r}4 \\
 \hline
 6 \overline{)196}
 \end{array}$$

With this method calculations with bigger numbers and decimal numbers are not much more difficult.

- The need to estimate answers is emphasised. This is especially important when doing calculations using decimal values:

“ 25.6 divided by 8?
 The closest multiple of 8 near to 25.6 is 24. This is 8×3 so an answer of 3 point something is what I expect. ”