# Formal written methods + - x ÷



Before Year 3 practical, informal methods are used; using either concrete objects, pictorial images or number knowledge to support calculations.

After Year 2 children should go through the three steps

- 1) Can I do this in my head?
- 2) Shall I make jottings to support mental methods?
- 3) Can I use a formal written method?

|        | + method                           | - method                              | x method   | ÷ method   |
|--------|------------------------------------|---------------------------------------|--|--|
| Year 1 |                                    |                                       |  |  |
| Year 2 |                                    |                                       |  |  |
| Year 3 | HTO Column addition                | HTO Column subtraction                | Grid method 2 digits by 1 digit Formal written   | 2 digits by 1 digit Formal written   |
| Year 4 | ThHTO Column addition              | ThHTO Column subtraction              | 2/3-digit numbers x 1 digit Formal written (short multiplication)                            | 2/3 digit by 1 digit Formal written (short division)                       |
| Year 5 | More than 4 digits Column addition | More than 4 digits Column subtraction | Up to 4 digits by 1/2 digits Inc. long multiplication for 2 digits                           | Up to 4 digits by 1 digit and interpret remainders Short division          |
| Year 6 | Decimals                           | Decimals                              | Multi-digit numbers up<br>to 4 by 2 digit using<br>formal/long<br>multiplication<br>Decimals | Up to 4 digits by 2 digit whole number using formal/long division Decimals |

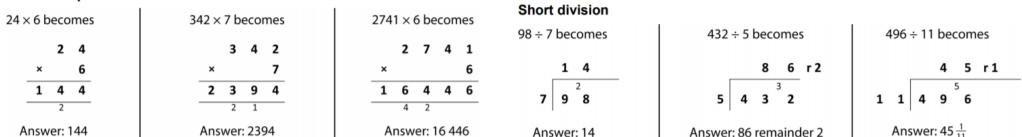
## Mathematics Appendix 1: Examples of formal written methods for addition, subtraction, multiplication and division.

This list is taken from the appendix of The National Curriculum 2014. It sets out examples of formal written methods for all four operations to illustrate a range of methods that could be taught. It is not intended to show progression in formal methods.

### Addition and subtraction

| 789 + 642 becomes | 874 – 523 becomes | 932 – 457 becomes | 932 – 457 becomes |
|-------------------|-------------------|-------------------|-------------------|
|                   |                   | 8 12 1            | 1 1               |
| 7 8 9             | 8 7 4             | 9 3 2             | 9 3 2             |
| + 6 4 2           | - 5 2 3           | - 4 5 7           | - A 8 7           |
| 1 4 3 1           | 3 5 1             | 4 7 5             | 4 7 5             |
| Answer: 1431      | Answer: 351       | Answer: 475       | Answer: 475       |

### **Short multiplication**



### Long multiplication

|   | 2<br><b>2</b> | 4 |  |
|---|---------------|---|--|
| × | 1             | 6 |  |
| 2 | 4             | 0 |  |
| 1 | 4             | 4 |  |
| 3 | 8             | 4 |  |

# 124 × 26 becomes 1 2 4 × 2 6 7 4 4 2 4 8 0 3 2 2 4 Answer: 3224

### Long division

432 ÷ 15 becomes

2 8 · 8

1 5 4 3 2 · 0

3 0 0 15×20

1 3 0 
$$\psi$$

1 3 0  $\psi$ 

1 3 0  $\psi$ 

1 2 0 15×8

1 2 0 0 1 2 0

1 2 0 0

Answer: 28 remainder 12

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

Answer: 28-8