

## Year 5 ADDITION

**MENTAL CALCULATION.** Many strategies, including:

**Mental recall of number bonds**

$$6 + 4 = 10$$

$$\square + 3 = 10$$

$$25 + 75 = 100$$

$$19 + \square = 20$$

**Use near doubles**

$$6 + 7 = \text{double } 6 + 1 = 13$$

**Addition using partitioning (splitting up) and recombining**

$$34 + 45 = (30 + 40) + (4 + 5) = 79$$

**Counting on or back in repeated steps of 1, 10, 100, 1000**

$$86 + 57 = 143 \text{ (by counting on in tens and then in ones)}$$

**Add the nearest multiple of 10, 100 and 1000 and adjust**

$$24 + 19 = 24 + 20 - 1 = 43$$

$$458 + 71 = 458 + 70 + 1 = 529$$

## WRITTEN METHODS

Children should extend the carrying method to numbers with at least four digits.

$$\begin{array}{r} 587 \\ + 475 \\ \hline 1062 \\ \hline 11 \end{array}$$

$$\begin{array}{r} 3587 \\ + 675 \\ \hline 4262 \\ \hline 111 \end{array}$$

*Using similar methods, children will:*

- ✓ *add several numbers with different numbers of digits;*
- ✓ *begin to add two or more decimal fractions with up to three digits and the same number of decimal places;*
- ✓ *know that decimal points should line up under each other, particularly when adding or subtracting mixed amounts.*

## Year 5 SUBTRACTION

**MENTAL CALCULATION.** Many strategies, including:

**Mental recall of addition and subtraction facts**

$$10 - 6 = 4 \qquad 17 - \square = 11$$

$$20 - 17 = 3 \qquad 10 - \square = 2$$

**Find a small difference by counting up**

$$82 - 79 = 3$$

**Counting on or back in repeated steps of 1, 10, 100, 1000**

$$86 - 52 = 34 \text{ (counting back from 86 in tens and then in ones or counting on from 52 to 86)}$$

$$460 - 300 = 160 \text{ (counting back in hundreds from 460 or counting on from 300 to 460)}$$

**Subtract the nearest multiple of 10, 100 and 1000 and adjust**

$$24 - 19 = 24 - 20 + 1 = 5$$

$$458 - 71 = 458 - 70 - 1 = 387$$

**Use the relationship between addition and subtraction**

$$36 + 19 = 55 \qquad 19 + 36 = 55$$

$$55 - 19 = 36 \qquad 55 - 36 = 19$$

## WRITTEN METHODS

**Partitioning and decomposition**

$$\begin{array}{r} \text{Step 1} \quad 754 = 700 + 50 + 4 \\ \quad \quad \quad - 286 \quad - 200 + 80 + 6 \end{array}$$

$$\begin{array}{r} \text{Step 2} \quad \quad \quad 700 + 40 + 14 \quad (\text{adjust from } T \text{ to } U) \\ \quad \quad \quad - 200 + 80 + 6 \end{array}$$

$$\begin{array}{r} \text{Step 3} \quad \quad \quad 600 + 140 + 14 \quad (\text{adjust from } H \text{ to } T) \\ \quad \quad \quad - 200 + 80 + 6 \\ \quad \quad \quad \hline 400 + 60 + 8 = 468 \end{array}$$

This would be recorded by the children as

$$\begin{array}{r} \quad \quad \quad \overset{600}{\cancel{700}} + \overset{140}{\cancel{50}} + 14 \\ \quad \quad \quad - 200 + 80 + 6 \\ \quad \quad \quad \hline 400 + 60 + 8 = 468 \end{array}$$

## Year 5 Subtraction (cont.)

### Decomposition

$$\begin{array}{r} 614\ 1 \\ \cancel{7}4 \\ - 286 \\ \hline 468 \end{array}$$

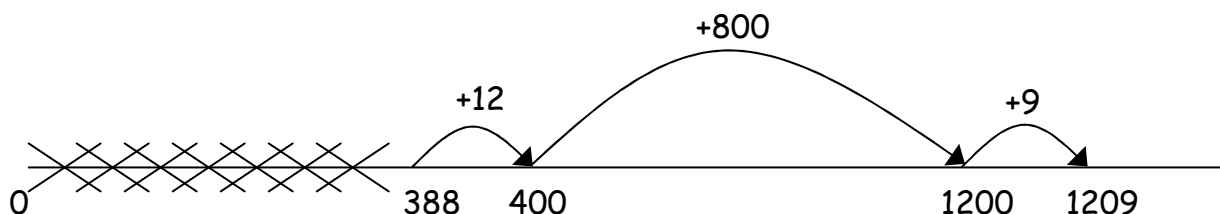
Children should:

- ✓ be able to subtract numbers with different numbers of digits;
- ✓ begin to find the difference between two decimal fractions with up to three digits and the same number of decimal places;
- ✓ know that decimal points should line up under each other.

**NB** If your children have reached the concise stage they will then continue this method through into year 6. They will not go back to using the expanded methods.

Where the numbers are involved in the calculation are close together or near to multiples of 10, 100 etc counting on using a number line should be used.

$$1209 - 388 = 821$$



## Year 5 MULTIPLICATION

**MENTAL CALCULATIONS.** Many strategies, including:

### **Doubling and halving**

Applying the knowledge of doubles and halves to known facts.

e.g.  $8 \times 4$  is double  $4 \times 4$

### **Using multiplication facts**

Years 5 & 6 Derive and recall quickly all multiplication facts up to  $10 \times 10$ . Some pupils manage  $\times 11$  and  $\times 12$  tables too.

Children should be able to use their tables knowledge to derive other facts.

e.g. If I know  $3 \times 7 = 21$ , what else do I know?

$30 \times 7 = 210$ ,  $300 \times 7 = 2100$ ,  $3000 \times 7 = 21\ 000$ ,  $0.3 \times 7 = 2.1$  etc

### **Use closely related facts already known**

$$\begin{aligned} 13 \times 11 &= (13 \times 10) + (13 \times 1) \\ &= 130 + 13 \\ &= 143 \end{aligned}$$

### **Multiplying by 10 or 100**

Knowing that the effect of multiplying by 10 is a shift in the digits one place to the left.

Knowing that the effect of multiplying by 100 is a shift in the digits two places to the left.

### **Partitioning (splitting up)**

$$\begin{aligned} 23 \times 4 &= (20 \times 4) + (3 \times 4) \\ &= 80 + 12 \\ &= 102 \end{aligned}$$

### **Use of factors**

$$8 \times 12 = 8 \times 4 \times 3$$

## WRITTEN METHODS

### **HTU $\times$ U**

(Short multiplication - multiplication by a single digit)

For example  $346 \times 9$

Children will approximate first:  $346 \times 9$  is approximately  $350 \times 10 = 3500$

## Year 5 Multiplication (cont.)

$$\begin{array}{r} \times \quad 300 \quad 40 \quad 6 \\ 9 \quad \boxed{2700} \quad \boxed{360} \quad \boxed{54} \\ \hline 2700 \\ + 360 \\ + \quad 54 \\ \hline \underline{3114} \\ \quad 11 \end{array}$$

OR the traditional method

$$\begin{array}{r} 346 \\ \times 9 \\ \hline 3114 \end{array}$$

TU x TU (Long multiplication - multiplication by more than a single digit)

$$72 \times 38$$

Children will approximate first:  $72 \times 38$  is approximately  $70 \times 40 = 2800$

Then use the Grid Method.

$$\begin{array}{r} \times \quad 70 \quad 2 \\ 30 \quad \boxed{2100} \quad \boxed{60} \\ 8 \quad \boxed{560} \quad \boxed{16} \\ \hline 2100 \\ + 560 \\ + 60 \\ + \quad 16 \\ \hline \underline{2736} \\ \quad 1 \end{array}$$

*Using similar methods, they will be able to multiply decimals with one decimal place by a single digit number, approximating first. They should know that the decimal points line up under each other.*

e.g.  $4.9 \times 3$

Children will approximate first  $4.9 \times 3$  is approximately  $5 \times 3 = 15$

$$\begin{array}{r} \times \quad 4 \quad 0.9 \\ 3 \quad \boxed{12} \quad \boxed{2.7} \\ \hline 12 \\ + \quad 2.7 \\ \hline \underline{14.7} \end{array}$$

## Year 5 DIVISION

**MENTAL CALCULATIONS.** Many strategies, including:

### **Doubling and halving**

Knowing that halving is dividing by 2

### **Deriving and recalling division facts**

Year 5 & 6 Derive and recall quickly division facts for all tables up to  $10 \times 10$ . Some pupils manage  $\times 11$  and  $\times 12$  tables too.

### **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**

$$378 \div 21 \quad \text{is} \quad 378 \div 3 = 126 \\ 126 \div 7 = 18$$

$$\text{so } 378 \div 21 = 18$$

### **Use related facts**

Given that  $1.4 \times 1.1 = 1.54$

What is  $1.54 \div 1.4$ , or  $1.54 \div 1.1$ ?

## WRITTEN METHODS

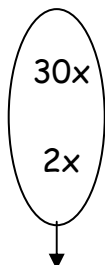
Children will continue to use written methods to solve short division  $\text{HTU} \div \text{U}$ .

Eg  $196 \div 6$

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

Or using the **Chunking Method**

$$\begin{array}{r} 32 \text{ r } 4 \\ 6 \overline{) 196} \\ - 180 \\ \hline 16 \\ - 12 \\ \hline 4 \end{array}$$



Answer : 32 remainder 4 or 32 r 4