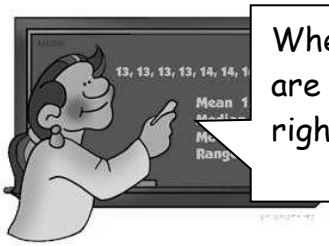
The Four Operations

I can use a variety of methods to solve number problems in familiar contexts, clearly communicating my processes and solutions. **MNU 3-03a**

I can continue to recall number facts quickly and use them accurately when making calculations. **MNU 3-03b**

Addition



When adding numbers, ensure that the numbers are lined up according to place value. Start at right hand side, write down units, carry tens

Example Add 3032 and 589

3032	3032	3032	3032
+589 →	+589 →	+589 →	+589
1	1 1	1 1	1 1
1	21	621	3621
2 + 9 = 11	3+8+1=12	0+5+1=6	3 + 0 = 3

Example Add 34•2 + 5•63 + 8

Remember that 34•2 is the same as 34•20 and 8 is the same as 8•00

$$\begin{array}{rr} & 34\bullet 20 \\ & 5\bullet 63 \\ + & 8\bullet 00 \\ \hline & 47\bullet 83 \\ \hline \end{array}$$

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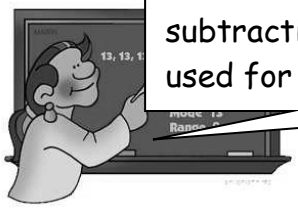
Subtraction



We use decomposition as a written method for subtraction (see below). Alternative methods may be used for mental calculations.

Example 1 4590 – 386

$$\begin{array}{r} {\scriptstyle 8\ 1} \\ 4590 \\ -\ 386 \\ \hline 4204 \end{array}$$

Remember to "exchange" when you don't have enough.

Example 2 Subtract 692 from 14 597

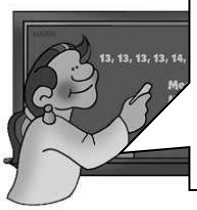
$$\begin{array}{r} {\scriptstyle 3\ 1} \\ 14\,597 \\ -\ \ 692 \\ \hline 13905 \end{array}$$

Example 3 Subtract 749 from 1000

$$\begin{array}{r} {\scriptstyle 0\ 9\ 9\ 1} \\ 1000 \\ -\ 749 \\ \hline 251 \end{array}$$

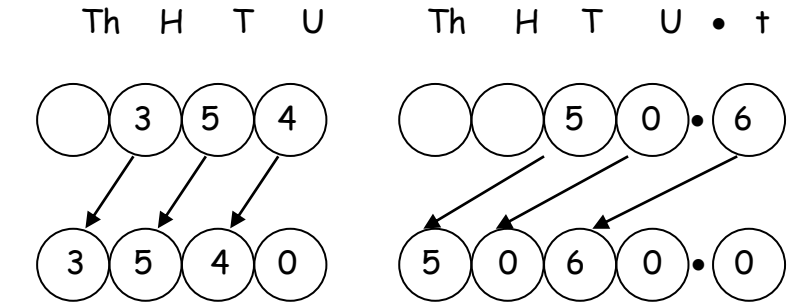
Multiplication

Multiplying by multiples of 10 and 100



To multiply by **10** you move every digit ***one*** place to the left.
To multiply by **100** you move every digit ***two*** places to the left.
We do **NOT** just add a zero to the end of the number

Example 1 (a) Multiply 354 by 10 (b) Multiply 50•6 by 100



354 x 10 = 3540

50•6 x 100 = 5060

(c) 35 x 30

To multiply by 30, multiply by 3, then by 10.

35 x 3 = 105
105 x 10 = 1050

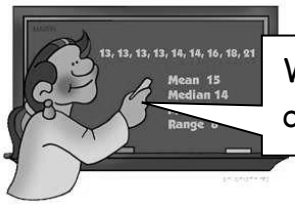
so 35 x 30 = 1050

(d) 436 x 600

To multiply by 600, multiply by 6, then by 100.

436 x 6 = 2616
2616 x 100 = 261600

so 436 x 600 = 261600



We may also use these rules for multiplying decimal numbers.

Example 2 (a) 2•36 x 20

2•36 x 2 = 4•72
4•72 x 10 = 47•2
so
2•36 x 20 = 47•2

(b) 38•4 x 500

38•4 x 5 = 192•0
192•0x 100 = 19200
so
38•4 x 50 = 19200

Multiplication 2

Multiplying by single digits

Example (a) Multiply 34 by 8

$$\begin{array}{r} 34 \\ \times\ 8 \\ \hline 272 \\ \hline \end{array}$$

(b) Multiply 42•6 by 7

$$\begin{array}{r} 42{\bullet}6 \\ \times\ 7 \\ \hline 298{\bullet}2 \\ \hline \end{array}$$

(c) Multiply 3•82 by 0•9

$$\begin{array}{r} 3{\bullet}82 \\ \times\ 0{\bullet}9 \\ \hline 3{\bullet}438 \\ \hline \end{array}$$

Estimate the answer first then take care with the position of the decimal point in the answer.

Check: Count the digits after the decimal point in the numbers you are multiplying (in this case 3). Therefore in the answer there are 3 digits after the decimal point.

Multiplying by double digits

Example: Multiply 46 by 83

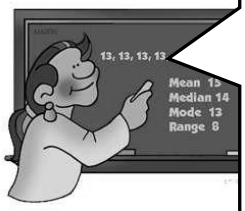
$$\begin{array}{r} 46 \\ \times\ 83 \\ \hline 138 \\ +\ 3680 \\ \hline 3818 \\ \hline \end{array}$$

Multiply 46 by 3.
Then multiply 46 by 80.

Add these two answers together.

Division

Dividing by multiples of 10 and 100



To divide by **10** you move every digit ***one*** place to the right.
To divide by **100** you move every digit ***two*** places to the right.
We do **NOT** just remove a zero from the end of the number

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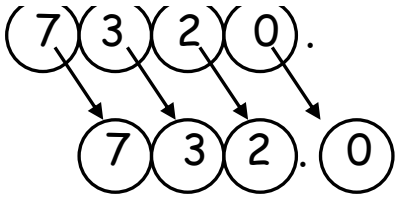
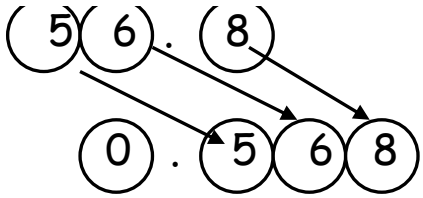
Example 1: 7320 ÷ 10



Note : 732•0 = 732

T U • t h th

2. 56•8 ÷ 100



A zero is needed in the units place

(c) Divide 330 by 30

When dividing by 30
Divide by 3, then by 10

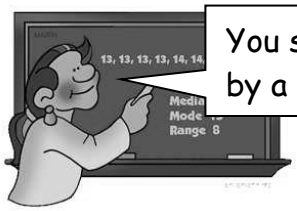
330 ÷ 3 = 110
110 ÷ 10 = 11

(d) Divide 546•8 by 200

When dividing by 200
Divide by 2 then by 100

546•8 ÷ 2 = 273•4
273•4 ÷ 100 = 2•734

Division 2



You should be able to divide by a single digit or by a multiple of 10 or 100 without a calculator.

Example 1 There are 192 pupils in first year, shared equally between 8 classes. How many pupils are in each class?

$$8 \overline{)1\,9^{3}2} \quad 24$$

There are 24 pupils in each class

Example 2 Divide 24 by 5

$$5 \overline{)2^{2}4} \quad 4\text{ r }4$$

So $5 \overline{)2^{2}4 \cdot {}^{4}0} \quad 4 \cdot 8$

Warning:

4 r 4 is NOT the same as 4•4

Change 24 to 24•0 and continue with the calculation

Example 3 Divide 4•74 by 3

$$3 \overline{)4 \cdot {}^{1}7^{2}4} \quad 1 \cdot 5\,8$$

When dividing a decimal number by a whole number, the decimal points must stay in line.

Example 4 A jug contains 2•2 litres of juice. If it is poured evenly into 8 glasses, how much juice is in each glass?

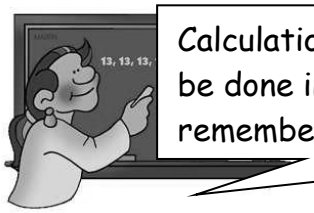
$$8 \overline{)2 \cdot {}^{2}2^{6}0^{4}0} \quad 0 \cdot 2\,7\,5$$

Each glass contains 0•275 litres

Where appropriate:
If you have a remainder at the end of a calculation, add as many zeros as necessary onto the end of the decimal and continue with the calculation.

Order of Operations (BIDMAS)

Consider this: What is the answer to 2 + 5 x 8 ?
Is it 7 x 8 = 56 or 2 + 40 = 42 ?
The correct answer is 42.



Calculations which have more than one operation need to be done in a particular order. The order can be remembered by using the mnemonic **BIDMAS**

The **BIDMAS** rule tells us which operations should be done first.
BIDMAS represents:

(B)rackets
(I)ndices
(D)ivide } **(M)ultiply**
(A)dd } **(S)ubract**

Scientific calculators use this rule, some basic calculators may not, so take care in their use.

Example 1 15 – 12 ÷ 6 BIDMAS tells us to divide first,
= 15 - 2 then subtract
= 13

Example 2 (9 + 5) x 6
= 14 x 6 Brackets first, then mulitply
= 84

Example 3 $4 + 2^3$ Index first, then add.
= 4 + 8
= 12

Example 4 $(4 + 2)^3$ Brackets first, then index.
= 6^3
= 216

Note: If only adding and subtracting are involved work your way along the calculation from left to right. e.g. 4 - 2 + 6 = 8.
The same is true for multiplying and dividing . e.g. 8 x 4 ÷ 2 = 16