

Maths was  
'different'  
in my day!

**A Parents'  
Guide to  
NUMERACY  
In Key Stage 3  
At SWCHS**

## What is Numeracy?

Numeracy is more than just Maths, although students encounter a large amount of numerical work in their Mathematics lessons, of course! We should also praise primary schools which have raised standards in the last few years.

Numeracy includes...

- Having a sense of the size of numbers
- Recalling mathematical facts when they are needed
- Calculating in your head or on paper
- Using a calculator or computer to solve problems effectively
- Measuring and estimating measurements
- Drawing and using scale drawings and maps
- Drawing conclusions from data
- Solving problems logically and explaining your reasoning

All of these skills and ideas appear right across the curriculum, but of course they are taught as key ideas in Maths lessons.

## Numeracy across the curriculum

Numeracy turns up in all sorts of unexpected places at school - not just in Maths lessons...

SCIENCE - formulae, percentages, graphs

ART - 2D & 3D shapes, ratio, perspective

TECHNOLOGY - measurements, calculations, estimates

HISTORY - dates, money, graphs & charts

ICT - spreadsheets, databases, flowcharts

LANGUAGES - money, measurements, numbers

MUSIC - rhythm and tempo, powers of 2

PE - speed, distance, time, energy calculations

GEOGRAPHY - fractions, percentages, ratios, maps, graphs

..... and in many other ways too!

Students sometimes can do skills in maths lessons but mysteriously cannot do the same thing 40m away in another subject. Students should be ready to apply the ideas they are taught in Maths to numerical problems they encounter in other areas of their school life.

The following pages give some advice on how parents can help their children to do that effectively...

## Where can students get help with numerical work?

Problems can often arise in homework tasks involving Mathematics and Numeracy, and can lead to anxiety and stress for students as well as parents.

Sources of help include....

- **STUDENTS' OWN WORK** - often there will be notes or examples in a student's exercise books which can be helpful
- **TEXTBOOKS** - students are issued with a Mathematics textbook annually, and this can be a useful reference source
- **THE INTERNET** - the school's website has direct links to useful sites for revision and review of work (eg mymaths but also consider BBC Bitesize and SAM Learning), or you could always just use Google as there are lots of clear "how to..." videos out there now.
- **TEACHERS** - this is an important one: if your child cannot solve a numerical problem, they should **go and see their Maths teacher about it**, even if they didn't actually set the work themselves. They will be happy to help, and it won't take long! Teachers are also easy to email and students will write emails in their exercise books in the first week here.

## The role of parents

Helping students with Maths or numerical homework is a bit of a "nightmare scenario" for many parents, so the following tips may help....

**KEEP STUDENTS ORGANISED** - check their organiser regularly for homework tasks set: they should always have at least 2 days to complete any task, so if they start early they have time to seek help. When signing planners we suggest asking to see a piece of maths your child has done that week of which they are particularly proud.

**BE SUPPORTIVE** - homework is meant to be more challenging than just repeating similar examples to classwork, so there are bound to be occasions where students feel "stuck". This does not mean that they will necessarily fail to get a good effort grade for their work if they seek help sensibly

**ENCOURAGE STUDENTS TO SEEK HELP** - all of the sources of help on the previous page could be useful, and it is not an admission of failure to use them

**HELP YOURSELF, IF YOU CAN** - of course, many parents can be extremely helpful to their children directly when working with numbers. Please be aware, though, that many "standard" written methods are emphasised less than approaches which encourage a mental understanding of the processes involved: for example, when tackling "113 take away 64", many students will be more familiar with a "number line" approach...

64  $+6$  70  $+30$  100  $+13$  113 30+6+13  
=49

...than with the formal calculation.....

$$\begin{array}{r} \cancel{1}13 \\ - 64 \\ \hline 49 \end{array}$$

If in doubt, look at the work in the students' books as a guide. More examples of "standard methods" are on the next pages but the traditional methods (see p9 onwards) learned in primary schools which you are most likely to be very familiar with are just as useful.

Please do not be afraid to teach methods that you know unless it is clearly confusing your son/daughter. Methods from the traditional long multiplication to using finger tricks for times tables are all helpful and can be of benefit to students.

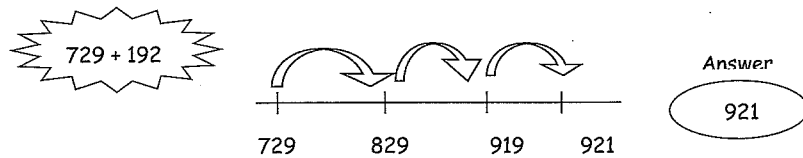
Please also remember that times tables are skills and skills need practice if they are not to be forgotten. Please practise the basics with them in car journeys, during the holidays and at other opportunities.

## Some "standard" methods

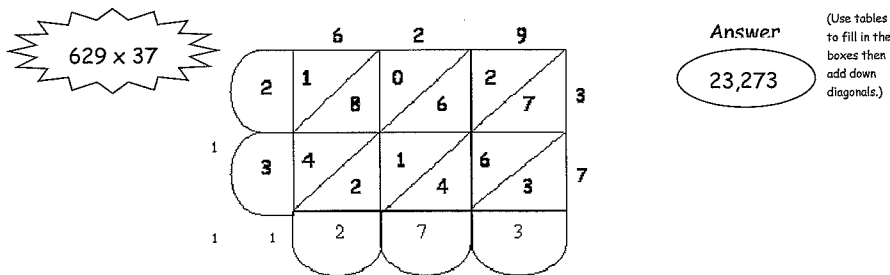
Students often have a variety of strategies available to them, but here are some commonly used approaches which may prove helpful when tackling difficulties with home work tasks. Examples are given which are relevant to Foundation level groups, moving on to more advanced techniques applicable to higher groups...

## Foundation level methods

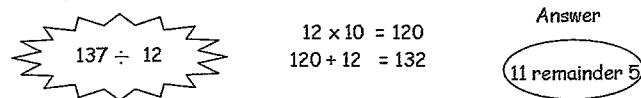
ADDITION & SUBTRACTION - use a number line



MULTIPLICATION - use this or other "box" methods

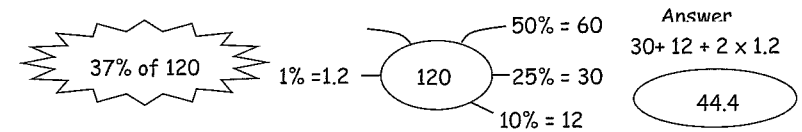


DIVISION - try "chunking"

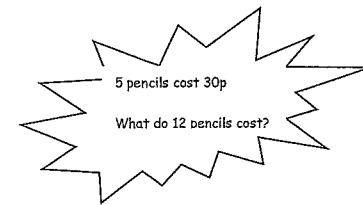


PERCENTAGES (without a calculator) - spiders can help, as can chunking from a clear starting amount like 10%

$$5\% = 6$$

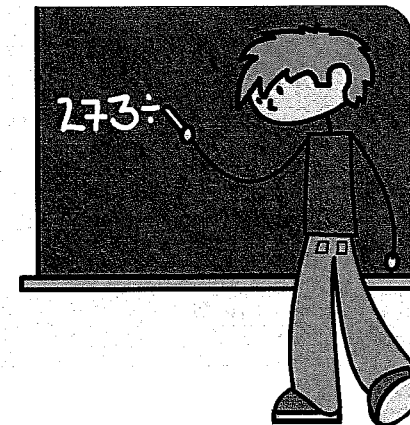


RATIO & FRACTIONS - try the Unitary Method



$$1 \text{ pencil cost } 30 \div 6 = 6\text{p}$$

$$\text{So 12 cost } 12 \times 6 = 72\text{p}$$



## Moving on to...

ADDITION & SUBTRACTION - formal "column" methods

$$\begin{array}{r} 729 \\ +192 \\ \hline 921 \\ \hline \end{array}$$

$$\begin{array}{r} \overset{5}{\cancel{6}}27 \\ -353 \\ \hline 274 \end{array}$$

DIVISION - formal written method

$$\begin{array}{r} 11 \text{ remainder } 5 \\ 12 \overline{)137} \end{array}$$

"12 goes into  
13 once, remainder 1"

$$\begin{array}{l} 1 \times 12 = 12 \\ 2 \times 12 = 24 \\ 3 \times 12 = 35 \end{array}$$

a times table written for  
reference can be handy!

PERCENTAGES - use decimal equivalents

$$37\% = \frac{37}{100} = 0.37$$

$$37\% \text{ of } 120 = 0.37 \times 120 \leftarrow \text{use a calculator}$$

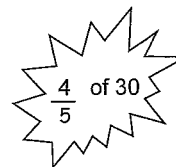
$$= 44.4$$

SHARING AN AMOUNT IN A GIVEN RATIO

Share £8.00 in the ratio 11:9  
 $11 + 9 = 20$ , so 20 equal shares needed  
 $£8 \div 20 = £0.40$  (40p)  
 $11 \times £0.40 = £4.40$   $9 \times £0.40 = £3.60$

## Foundation level methods

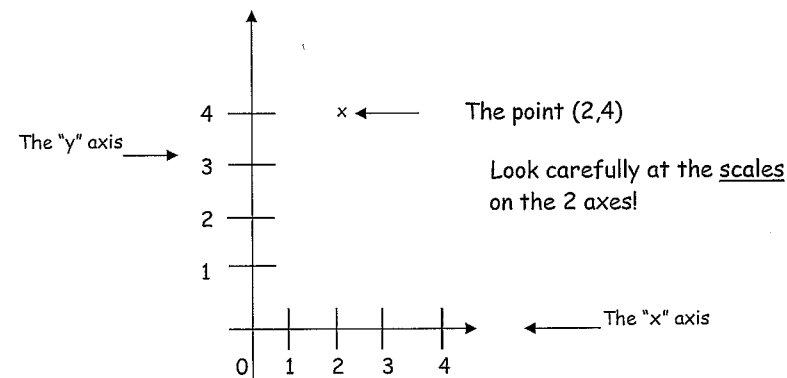
FRACTIONS - finding a fraction of an amount



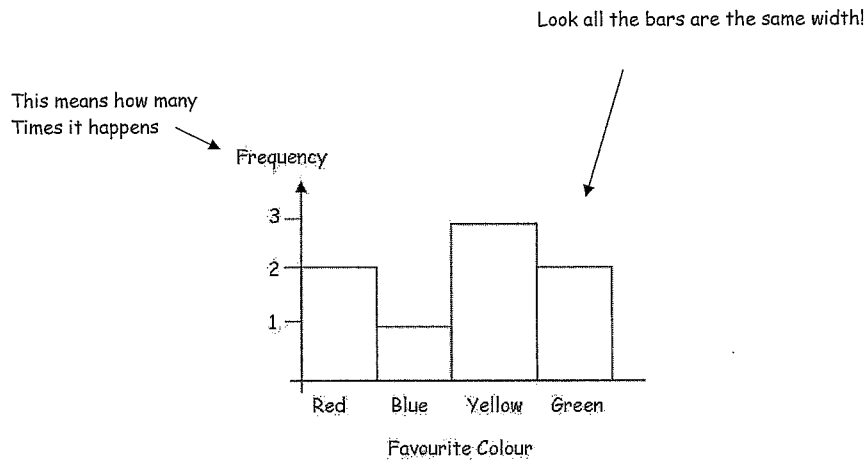
$$\frac{1}{5} \text{ of } 30 = 30 \div 5 = 6$$

$$\frac{4}{5} \text{ of } 30 = 6 \times 4 = 24$$

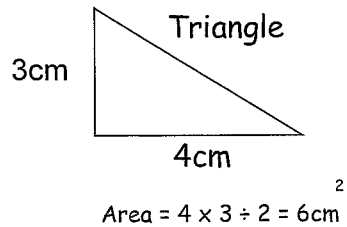
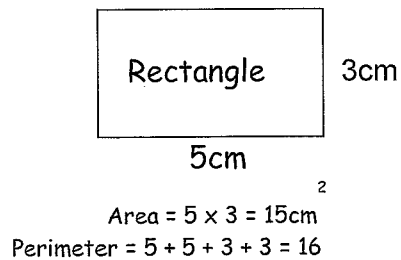
GRAPHS - axes and co-ordinates



**DATA HANDLING - display data in a bar chart**



**AREA & PERIMETER - simple shapes**



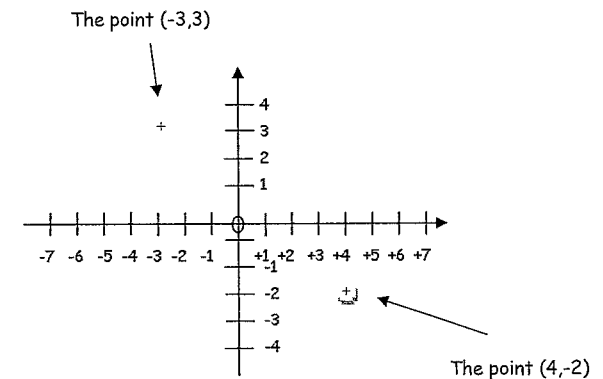
**Moving on to .....**

**FRACTIONS - calculating with fractions**

$$\frac{1}{5} \times \frac{3}{4} = \frac{1 \times 3}{5 \times 4} = \frac{3}{20}$$

$$\frac{1}{2} + \frac{1}{4} = \frac{2}{4} + \frac{1}{4} = \frac{3}{4}$$

**GRAPHS - axes and co-ordinates with negative numbers**

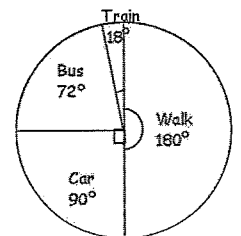


Watch out near (0,0)!

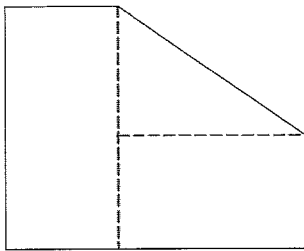
**DATA HANDLING - understand and construct pie charts**

| Travel | Frequency |
|--------|-----------|
| Walk   | 10        |
| Car    | 5         |
| Bus    | 4         |
| Train  | 1         |

$360^\circ \div 20 = 18^\circ$   
 $18^\circ$  for each person  
 eg:  $4 \times 18 = 72$   
 $72^\circ$  for bus  
 20 people altogether



AREA & PERIMETER - deal with compound shapes



Split shape into simple rectangles & triangles, then add up all areas

## Calculators

Students are expected to bring a calculator to *every* Maths lesson, and the safest course is to bring a calculator to school every day, as they may need it in any other lesson! Of course, there will be many occasions when the emphasis is on working *without* a calculator (either in your head or on paper), but the appropriate and careful use of calculators and other ICT resources is an important aspect of Numeracy.

Scientific calculators, with enough functions to last students right through SAT's, GCSE's and AS levels, are available through the school (directly from any Maths teacher), but any brand of scientific calculator will do.

## Mental skills

Students' mental calculation skills are practised regularly in Maths lessons - often as a "starter" activity. Some examples of the skills being developed at this stage are given below...

### LOWER GROUPS

Continue a sequence given a term-to-term rule (eg add on 5)

Find simple fractions, eg a half or a third of a number

Convert between metres & centimetres, or metres & kilometres

Recall multiplication facts (times tables) up to  $10 \times 10$

### HIGHER GROUPS

Make & justify estimates of calculations

Multiply and divide using factor facts (eg  $x15$  is  $x5$  and  $x3$ )

Recall prime numbers to 100

Describe and estimate bearings from diagrams

Substitute values into formulae



### The tables square - a chance to practise!

| X  | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10  |
|----|----|----|----|----|----|----|----|----|----|-----|
| 1  | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10  |
| 2  | 2  | 4  | 6  | 8  | 10 | 12 | 14 | 16 | 18 | 20  |
| 3  | 3  | 6  | 9  | 12 | 15 | 18 | 21 | 24 | 27 | 30  |
| 4  | 4  | 8  | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40  |
| 5  | 5  | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50  |
| 6  | 6  | 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 | 60  |
| 7  | 7  | 14 | 21 | 28 | 35 | 42 | 49 | 56 | 63 | 70  |
| 8  | 8  | 16 | 24 | 32 | 40 | 48 | 56 | 64 | 72 | 80  |
| 9  | 9  | 18 | 27 | 36 | 45 | 54 | 63 | 72 | 81 | 90  |
| 10 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |

Activities you could use with the square include...

- Write it out as quickly as possible
- "Fill in blanks" in a partly completed square
- Use it to do tougher calculations, eg  $12 \times 8$  (start with  $6 \times 8$ )
- Rearrange the row and column headings for a tougher speed challenge
- Explore numbers which occur many times, eg 24
- Look at patterns, eg odd and even numbers