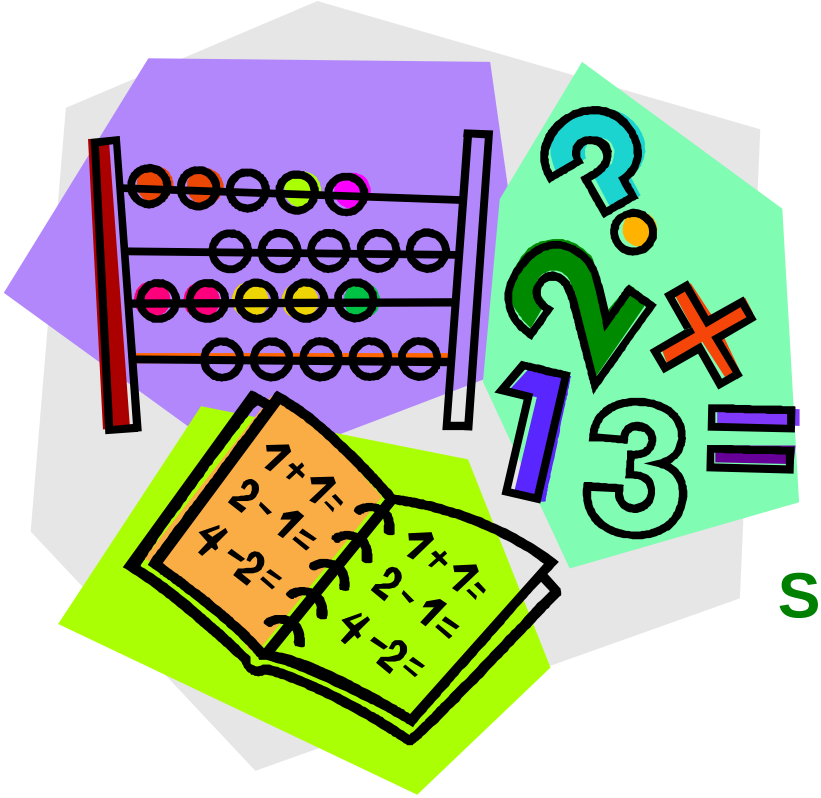
Awbridge Primary School

MAKE YOUR CHILD A MATHS STAR!

A PARENTS' GUIDE TO HELPING YOUR CHILDREN WITH MATHS



Booklet 2 of 3:

Key Stage 2
Stage 3 to Stage 4

"IT WASN'T LIKE THIS WHEN I WAS AT SCHOOL!"

Have you ever wished that you understood current Maths methods better? Many parents find that their children are using methods or strategies, which are very different from those used in the past. This can often cause confusion when trying to support your child at home. This booklet has been prepared to give you a record of the strategies your child will be using in school.

The main methods used in each stage by the majority of pupils for addition, subtraction, multiplication and division are shown. These methods are introduced throughout the teaching year so most pupils should be familiar with all methods by the end of the year. Each sheet also shows typical maths vocabulary that children will be acquiring and using at this stage. The multiplication section also explains which tables facts they are expected to know in that stage.

This is a guide only; children will always progress at different speeds. However, support from you will undoubtedly be of great benefit to them at all times. If you have any questions, your child's teacher will be pleased to discuss the strategies with you.

This booklet is part of a series of 3, covering Stage 1 to Stage 6.

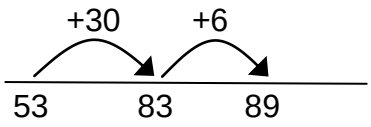
Turn your child into a Mathemagician!

STAGE 3 - Addition

Number line (left to right):

Children will continue to use empty number lines with increasingly large numbers. They start with the largest number first:

36 + 53



Partitioning: Splitting into tens and ones:

Children partition numbers into tens and ones in order to add them:

```
  47 =      40  +  7
+ 76        70  +  6
          110  +  13  =  123
```

Expanded column addition:

In stage 3, children are introduced to vertical addition using an expanded method. They need to know that ones line up under ones, tens under tens etc. They add the ones first:

```
   75
+ _48
   13
  110
  123

  267
+ _85
   12
  140
  200
  352
```

Compact Standard addition:

By the end of stage 3, children will have been introduced to the standard compact method for addition.

```
  625
+  48
 673
   1
```

Vocabulary:

add, addition, more, plus, make, sum, total, altogether, how many more to make…? how many more is… than…? numberline, partition, hundreds, tens, ones, count on.

STAGE 4 - Addition

Expanded column addition:

In stage 4 children revise expanded column addition as introduced in stage 3 (starting with the ones):

```
  685
+  78
   13
  150
  600
  763
```

Standard compact addition:

The main focus in stage 4 is on the teaching of the standard method, initially with no carrying then including carrying below the line. Include HTO + TO and HTO + HTO including crossing tens or hundreds boundaries, extending to crossing both boundaries and using up to four digit numbers:

```
  625
+  48
  673
   1
```

For the middle column children are taught to say "20+40+10=70 Rather than "2+4+1=7"

```
  783
+  42
  825
   1
```

```
  367
+  85
  452
  1 1
```

Using similar methods, children will begin to add two or more three digit sums of money, knowing that decimal points should line up under each other. Include calculations involving adjustment from pence to pounds.

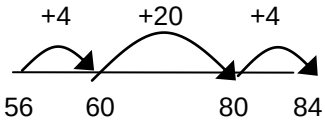
For example:
£4.21 + £3.87 £3.59 + 78p

Vocabulary:
add, addition, more, plus, increase, sum, total, altogether, score, adjust, near double, how many more to make…? numberline, partition, hundreds, tens, ones, count on

STAGE 3 - Subtraction

Number lines:

In stage 3, children will recap use of number lines to find differences by counting up. They are encouraged to look for landmark numbers to increase efficiency of jumps:
84 - 56



Start from 56 and count on until reaching 84

84 – 56 = 28

Partitioning (no exchange):

In stage 3, children are shown how to subtract by partitioning numbers:

```
  89  =    80  +  9
- 57        50  +  7
             30  +  2  = 32
```

Partitioning (with exchange):

```
  71
- 46
```

Demonstrate as follows:

Step 1:

```
 70  +  1
-40  +  6
```

Step 2:

```
  60  +  11
- 40  +   6
  20  +   5 =  25
```

This would be recorded by the children as:

```
     60
     ~~70~~  +  1 1
  -  40  +  6
     20  +  5  = 25
```

Children need to know that ones line up under ones, tens under tens etc.

By the end of stage 3, children will have been introduced to compact standard subtraction:

```
    4
   ~~5~~ 1
  4
- 1 2 8
  3 2 3
```

See stage 4 for guidance on steps to say as you do this with children.

Vocabulary

subtract, subtraction, take (away), minus, leave, how many are left/left over? one less, two less… ten less… one hundred less how many fewer is… than…? how much less is…? difference between, equals, sign, is the same as, tens boundary, hundreds boundary, gap

STAGE 4 - Subtraction

Partitioning:

In stage 4, children briefly revise subtraction by partitioning as introduced in stage 3. E.g.

754
- 86

Step 1

700 + 50 + 4
- 80 + 6

Step 2

700 + 40 + 14 *(adjust from T to O)*
- 80 + 6

Step 3

600 + 140 + 14 *(adjust from H to T)*
- 80 + 6
600 + 60 + 8 = 668

This would be recorded by the children as:

600 140
~~700~~ + ~~50~~ + $^{1}4$
- 80 + 6
600 + 60 + 8 = 668

Compact column subtraction (decomposition):

In stage 4, the main method for subtraction will be standard subtraction by decomposition (initially with one exchange, then with two) and including up to four-digit numbers:

7
4 ~~8~~^{1}3
-1 7 6
3 0 7

6 14
~~7~~ ~~5~~^{1}4
- 8 6
6 6 8

Steps to say:

- 4 take 6 can't be done.
- Exchange one group of ten from 50, leaving 4 tens.
- This now gives us 14 take 6 which is 8.
- 4 tens take 8 tens can't be done.
- Exchange one group of a hundred from 700, leaving 6 hundred.
- This now give us 14 tens take 8 tens which is 6 tens.
- 6 hundred take 0 hundred leaves 6 hundred.

Vocabulary:

subtract, subtraction, take (away), minus, decrease, leave, how many are left/left over? difference between, how many more/fewer is… than…? how much more/less is…? is the same as, tens boundary, hundreds boundary, inverse

STAGE 3 - Multiplication

***Tables Focus**: Children need to know x2, x3, x4 x5, x6, x8 and x10 tables and related division facts.*

In stage 3, children will continue to develop understanding of multiplication through visual images such as arrays and number lines:

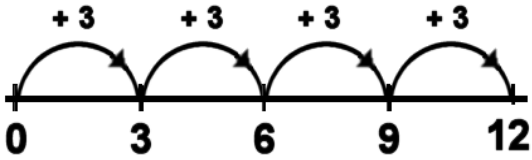
Working out multiplications using an array: 4 x 3

3 rows of 4 **or 4 rows of 3**

4 x 3 = 12

Repeated addition using a number line:

3 x 4 (4 jumps of 3)



3 x 4 = 12

Grid Method:

Children learn to partition numbers into tens and ones in order to multiply two digit numbers by a single digit.
14 x 4

x	10	4
4	40	16

40
+ 16
56

Vocabulary:
lots of, groups of, times, multiply, multiplication, multiplied by multiple of, product, once, twice, three times… ten times… times as, repeated addition, array, row, column, double, grid method

STAGE 4 - Multiplication

<u>Tables Focus</u>: Children need to know all tables facts up to 12 x 12 and the associated division facts.

<u>Grid method:</u>

Children start in stage 4 by revising the grid method as introduced in stage 3. This is a useful staging post between mental and written methods. They are encouraged to estimate answers first. E.g.

64 x 8 ≈ 60 x 10 = 600

X	60	4
8	480	32

480
+ 32
512
1

<u>Expanded short multiplication TO x O (ones first):</u>

In stage 4 children are introduced to more formal methods of multiplication, firstly using an expanded column format, but showing the working. Draw attention to the links with the grid method. Children should describe what they do by referring to the actual values of the digits in the columns. For example, 30 x 7 not 3 x 7

Start by multiplying the ones digit as this will ease transition to short multiplication.

38
x 7
56 (8 x 7)
210 (30 x 7)
266

Lead on to recording without the multiplications stated in brackets:

67
x 8
56
480
536
1

By the end of stage 4, children should be confident with compact multiplication for two and three-digit numbers:

254
x 8
2032
43

Vocabulary:

lots of, groups of, times, multiply, multiplication, multiplied by, multiple of, product, once, twice, three times… ten times… times as, repeated addition, array, row, column, double, grid method, short multiplication.

STAGE 3 - Division

Grouping:

In stage 3, the main focus is on grouping rather than sharing (as this will support written methods introduced in stage 4). Children still need plenty of practical tasks and pictorial representation.

Include problems involving remainders where children have to decide whether to round up or down e.g.

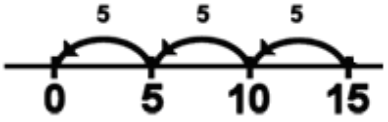
8 children can travel in a minibus.
How minibuses would you need to take 29 children to a football match?

Answer is: 'You need 4 minibuses for all the children to travel.'

Also link to finding fractions of numbers and quantities e.g. find 1/6 of £24 by dividing 24 by 6.

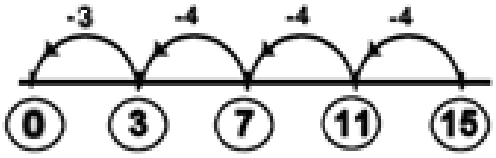
Repeated subtraction using a number line:

Children continue to develop their understanding of division as forming groups of equal size through repeated subtraction shown on a number line (as introduced in stage 2).
15 ÷ 5



3 jumps of 5
so 15 ÷ 5 = 3

With a remainder: 15 ÷ 4



3 jumps of 4 and 3 left over

15 ÷ 4 = 3 r 3

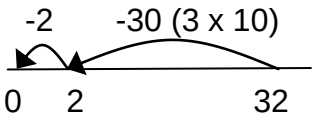
Vocabulary:
share, share equally, one each, two each, three each… group in twos, threes… tens, equal groups of, divide, division, divided by, divided into, left over, remainder, halve, arrays, jumps, repeated subtraction.

STAGE 4 - Division

Number lines:

Develop use of repeated subtraction by subtracting multiples of the divisor:

32 ÷ 5



Repeated subtraction (chunking):

Children develop written methods for division by subtracting repeated chunks of the divisor (as previously modelled on number line):

64 ÷ 4

64
-40 (4 x 10)
24
-24 (4 x 6)
0

Answer: 16

Include examples involving remainders e.g.

96 ÷ 7

96
-70 (7 x 10)
26
-21 (7 x 3)
5

Answer 13 r5

Short Division:

Short division will be introduced to children by the end of stage 4.
The children will record as follows: (initially they will label the columns as this helps to relate to the place value of the digits).

T O
2 7
3)8^{2}1

It really helps by this stage if children are confident with multiplication and division facts and with subtracting multiples of ten mentally, as well as having sound understanding of partitioning and place value.

Vocabulary:

halve, share, share equally, one each, two each, three each… group in pairs, threes… tens, equal groups of, divide, division, divided by, divided into, remainder, factor, quotient, divisible by, inverse, halve, fact families, chunking.

The following are some suggested websites that can help support you child's maths.

BBC Maths
http://www.bbc.co.uk/education/subjects/z826n39
http://www.bbc.co.uk/education/mathsfile/index.shtml

Woodlands Junior School Maths Zone
http://www.woodlands-junior.kent.sch.uk/maths/index.html

Ambleside Primary School
http://www.amblesideprimary.com/ambleweb/numeracy.htm
Go to Tools for Teaching section

TopMarks Education Resources
http://www.topmarks.co.uk/

CoolMath4kids (US Site)
http://www.coolmath4kids.com/

Primary Games (evaluation versions but playable)
http://primarygames.co.uk

Counton
http://counton.org

Maths is Fun (includes explanations/games/puzzles and quizzes)
http://mathsisfun.com

Teaching Tables (evaluation versions but playable)
http://teachingtables.co.uk

Maths Dictionary
http://www.amathsdictionaryforkids.com

Nrich (good for problems/puzzles)
http://nrich.maths.org/frontpage

Also the pupils will have access to the following sites using their given log-ins:

http://www.mathletics.co.uk/

http://www.mymaths.co.uk/