

Maths
at
Gulworthy Primary School



How to help your child
Year 6

Ways to help your child at home

Number

Practise:

- Counting forwards and backwards in different amounts including whole numbers, decimals and fractions.
- All times tables up to 12x12
- Make a card game. Multiplication table on one card, answer on another. Match them up.
- Writing and reading numbers to 10,000,000
- When out shopping round prices to the nearest pound, ten pounds etc.
- When watching sports such as athletics consider what times would be rounded to the nearest tenth, hundredths or whole second.
- Write some word problems for different calculations and solve them. Link it to something they enjoy e.g. football, comic characters. Make sure that they include all the operations (+, -, x, ÷)

Money

- Ask children to add sums of money and work out change
- Allow children to experience the use of real money
- Ask children to find fractions of amounts of money
- Ask children to work out the new price when a product has e.g. 10% off or 25% off.

Measures and shape

- Encourage children to wear an analogue watch and give them opportunities to tell the time using analogue and digital format. What times of the day do they do different things? How long do they spend on each activity?
- Involve your child with cooking; encourage them to weigh the different ingredients.
- Play shape bingo. Draw six shapes and ask someone to read out clues and see if you can cross them off.
- Discuss angles in relation to turns. Is this turn greater or less than a right angle? What do you predict it would be in degrees?
- Compare the volume of different containers used in cooking.
- Encourage children to assist in converting from imperial to metric measurements when using older/American recipes.

Statistics

- Discuss the timetable when catching buses or trains
- Find the mean of data that occurs in interests e.g. the mean number of goals scored by teams in the Rugby Premier League or the mean number of views attained by a youtubers videos.

How we teach addition, subtraction, multiplication and division

Throughout Key Stage 2 your child will be encouraged to choose the most efficient and suitable method to solve a calculation. This will include choosing whether a mental method or written method is most suitable. Children may still write down some written workings to help them when using mental methods e.g. number lines.

Children are taught maths through a process of fluency, problem solving and then reasoning about their work and answers.

In Upper KS2, children will also use many of the methods below when working with decimal numbers.

Addition and subtraction

In **year 6** children will work choosing the most efficient and suitable methods, including those examples below, with numbers up to **10,000,000**.

Addition vocabulary: plus, add, and, more than, more, sum.

Subtraction vocabulary: subtract, minus, take away, less than, less, difference

Rounding and adjusting (mental method for addition and subtraction)

$$£3.98 + £4.67 \quad \rightarrow \quad £4 + £4.67 = £8.67 \quad \rightarrow \quad £8.67 - 2p = £8.65$$

To add the two prices together, first round £3.98 to £4 as this gives an easier number to add onto. Then in your head add on the £4.67 to the £4 to give £8.67. Finally subtract the 2p you added on in the first step in order to adjust your final answer and make it correct.

Further example: $6389 - 2999 \rightarrow 6389 - 3000 = 3389 \rightarrow 3389 + 1 = 3390$

Sequencing (mental method for addition and subtraction)

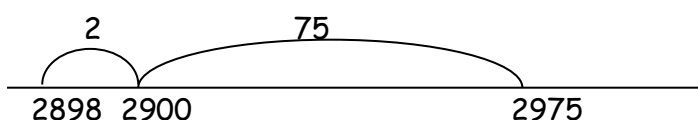
$$1152\text{km} + 836\text{km} \rightarrow 1152 + 800 + 30 + 6 = 1988\text{km}$$

Count on from the first number by partitioning the smaller number and then adding on the hundreds first, then the tens and finally the ones.

Further example: $2745\text{km} - 323\text{km} \rightarrow 2745 - 300 - 20 - 3 = 2422\text{km}$

Counting on to find the difference (mental method for subtraction)

$$2975 - 2898 = 77$$



$$75 + 2 = 77$$

Counting on can be useful when the numbers in the subtraction calculation are close together. We start with the lower number and count on until we reach the higher number. In this calculation we have counted on a step of 2 and another step of 75. The difference between the two numbers is therefore 77.

Partitioning (mental method for addition and subtraction)

$$350 + 470 \rightarrow 300 + 400 = 700 \quad 50 + 70 = 120 \quad \rightarrow 700 + 120 = 820$$

First the numbers are partitioned into their place value parts (Hundreds, Tens and Ones). Then these are combined together e.g. $300 + 400$ and $50 + 70$. The totals of these combined parts are then added to give the overall total.

Further example: $860 - 350 \rightarrow 800 - 300 = 500 \quad 60 - 50 = 10 \rightarrow 500 + 10 = 510$

When subtracting, the numbers are partitioned and then the hundreds subtracted from each other followed by the tens and ones. Remaining hundreds, tens and ones are then added back together to recombine the number.

Using place value and known facts (Mental method for addition and subtraction)

$$2300 + 4500 \rightarrow 23 + 45 = 68 \rightarrow 68\text{00}$$

$2300 + 4500$ is the same as 23 hundreds + 45 hundreds. So we can use a mental method to do $23 + 45 = 68$ and then use our knowledge of place value to place two zeros at the end of the number so that the 6 and the 8 move correctly into the thousands and hundreds columns respectively. Note that the zeros are not 'added' on as $68 + 0 + 0$ would still equal 68.

Further example: $7300 - 3100 \rightarrow 73 - 31 = 42 \rightarrow 42\text{00}$

Column Addition (A formal written method for addition)

$$\begin{array}{r} 1237 \\ +2345 \\ \hline 1 \\ \hline 3582 \end{array}$$

$$1237 + 2345 = 3582$$

Add the ones

Carry ten or more into the next column.

Add the tens

Add the hundreds

Add the thousands

The blue digit is a new ten that had been made and placed on the 'carry line' where new tens, hundreds or thousands are placed to be added on.

Column subtraction (A formal written method for subtraction)

$932 - 457$ becomes Each column is subtracted in turn starting from the ones.

$$\begin{array}{r} 8 \quad 12 \quad 1 \\ 9 \quad 3 \quad 2 \\ - 4 \quad 5 \quad 7 \\ \hline 4 \quad 7 \quad 5 \end{array}$$

1. $2 - 7$ cannot give a positive answer so a ten is exchanged for 10 ones giving $12 - 7$ to work out and answer of 5 ones.

2. This leaves 2 tens which is not enough to take away 5 tens from so a hundred is exchanged for 10 tens giving 12 tens in total. We then take 5 tens away from 12 tens giving and answer of 7 tens.

Answer: 475

3. There are 8 hundreds remaining and we can subtract the required 4 hundreds from it giving an answer of 4 hundreds.

Same Difference Method for subtraction (Mental/Written Method)

This is a useful method to use when a calculation would require lots of 'borrowing' which can then lead to a messy looking calculation which is hard to get lost in.

Example: $3,412 - 1999$ becomes $3,413 - 2000 = 1,413$. Because the new calculation has had 1 added to each parting (making a rounder number) this and the original calculation have the same difference and as such the same answer.

Multiplication and Division

In **Year 5** children will be taught to multiply up to 4 digit numbers by a one or two digit number using a standard written method. They will be taught to divide a 4 digit number by a 1 digit number. By the end of **year 5** the national expectation is that children know the multiplication and division facts for all times tables up to 12×12 .

Multiplication Vocabulary: multiply, times, groups of, lots of, multiple, array, repeated addition.

Division vocabulary: divide, shared, how many groups of..., remainder

Using a known fact and then scaling up (Mental method for multiplying and dividing)

$$4 \times 800 \rightarrow 4 \times 8 = 32 \rightarrow 3200$$

The known times table fact $4 \times 8 = 32$ has been used before scaling the answer up and making it 100 times bigger as required in the original calculation. This has been achieved by putting two zeros on the end of 32 which causes the 3 and 2 to move into the thousands and hundreds columns respectively.

$$\text{Another example} \rightarrow 6800 \div 2 \rightarrow 68 \div 2 = 34 \rightarrow 3400$$

Doubling and Halving (Mental method for multiplying and dividing)

Doubling and halving can be used to assist in a variety of calculations:

To multiply by 4 - double and double again e.g. $16 \times 4 \rightarrow$ double 16 = 32 \rightarrow double 32 = 64

To multiply by 8 - double, double and double again e.g. $16 \times 8 \rightarrow$ double 16 = 32 \rightarrow double 32 = 64 \rightarrow Double 64 = 128

To divide by 4 - halve and halve again e.g. $64 \div 4 \rightarrow$ half of 64 = 32 \rightarrow half of 32 = 16

To divide by 8 - halve and halve again e.g. $640 \div 8 \rightarrow$ half of 640 = 320 \rightarrow half of 320 = 160 \rightarrow half of 160 = 80

To multiply by 50 - Multiply by 100 using place value and then halve e.g. $26 \times 50 \rightarrow 26 \times 100 = 2600 \rightarrow$ half of 2600 = 1300.

To multiply by 25 - Multiply by 100 using place value and then halve and halve again e.g. $26 \times 50 \rightarrow 26 \times 100 = 2600 \rightarrow$ half of 2600 = 1300 \rightarrow half of 1300 = 650

To multiply by 5 - Multiply by 10 and then halve e.g. $3800 \times 5 \rightarrow 3800 \times 10 = 38000 \rightarrow$ half of 38000 = 19000

Children will also be encouraged to make links between these strategies and those that can be used when working with decimals e.g. how can the method for multiplying by 25 help us when multiplying by 0.25.

Column Multiplication (Written method for multiplication)

Short multiplication

24 × 6 becomes

$$\begin{array}{r} 24 \\ \times 6 \\ \hline 144 \\ \hline 2 \end{array}$$

Answer: 144

342 × 7 becomes

$$\begin{array}{r} 342 \\ \times 7 \\ \hline 2394 \\ \hline 21 \end{array}$$

Answer: 2394

2741 × 6 becomes

$$\begin{array}{r} 2741 \\ \times 6 \\ \hline 16446 \\ \hline 42 \end{array}$$

Answer: 16 446

Dividin

g using manipulatives and sharing (Division)

Phoebe solves $87 \div 4$ using this approach

Step 1 Build the number	Step 2 Share the tens	Step 3 Share the ones																				
<p align="center">$87 \div 4$</p>	<p align="center">$80 - 4 = 20$</p> <table border="1"> <thead> <tr> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr><td>10 10</td><td></td></tr> <tr><td>10 10</td><td></td></tr> <tr><td>10 10</td><td></td></tr> <tr><td>10 10</td><td></td></tr> </tbody> </table>	T	O	10 10		10 10		10 10		10 10		<p align="center">$20 + 1r3 = 21r3$ $87 \div 4 = 21r3$</p> <table border="1"> <thead> <tr> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr><td>10 10</td><td>1</td></tr> <tr><td>10 10</td><td>1</td></tr> <tr><td>10 10</td><td>1</td></tr> <tr><td>10 10</td><td>1</td></tr> </tbody> </table> <p align="right">1 1 1</p>	T	O	10 10	1	10 10	1	10 10	1	10 10	1
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Dividing using short division (Written method of division)

In year 5 children will use this method when appropriate to their learning for dividing 4 digit numbers by 1 digit numbers and divisions including dividing by 11 and 12.

Short division

$98 \div 7$ becomes

$$\begin{array}{r} 14 \\ 7 \overline{) 98} \\ \underline{7} \\ 28 \\ \underline{28} \\ 0 \end{array}$$

Answer: 14

$432 \div 5$ becomes

$$\begin{array}{r} 86r2 \\ 5 \overline{) 432} \\ \underline{40} \\ 32 \\ \underline{30} \\ 2 \end{array}$$

Answer: 86 remainder 2

Division - Long Division (Written method of division)

In Class 3 we primarily focus on this method of long division. Which is then extended later to include expressing remainders as a decimal by placing a decimal point after the ones column and then bringing down zeros in order to work out the tenths, hundredths etc.

Long division

$432 \div 15$ becomes

$$\begin{array}{r} 28\text{ r }12 \\ 15 \overline{) 432} \\ \underline{300} \\ 132 \\ \underline{120} \\ 120 \\ \underline{120} \\ 0 \end{array}$$

1. We can make no lots of 15 hundreds so the hundreds column of the answer is blank.
2. We can then look at the hundreds and tens together. We can make 2 lots of 15 tens out of 43 tens. (So we write 2 in the tens column above in the answer section).
3. $15 \text{ tens}(150) \times 2 = 300$ so this is subtracted leaving 132 left remaining to divide.
4. We can make 8 lots of 15 ones so 8 is written in the answer section.
5. 8 lots of 15 equals 120 so this is subtracted from 132 leaving 12.
6. The remainder is 12.

$$\begin{array}{r} 28.8 \\ 15 \overline{) 432.0} \\ \underline{300} \\ 132 \\ \underline{120} \\ 120 \\ \underline{120} \\ 0 \end{array}$$

120 tenths

Dividing by 10, 100 and 1000 - including giving decimal answers

When dividing by 10 and 100, children are taught that the decimal point never moves and that the numbers move down the place value columns or slide across the place value columns making them ten times smaller each time they move down one column.

Th	H	T	U	t	h
		2	7	• 0	0
		(÷ 10)	2	• 7	0
		(÷ 100)	0	• 2	7

To divide by 10, move the digits one space to the right
 To divide by 100, move the digits two spaces to the right

Year 6 Curriculum Objectives

Please note that a complete list of the year 6 maths objectives can be downloaded from the class web site.

We hope this leaflet has helped you to understand how your child learns maths at Gulworthy and that it will enable you to help your child to really enjoy maths.