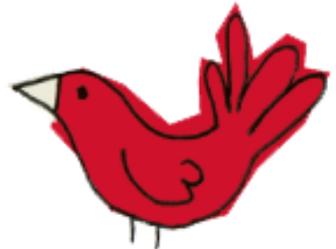
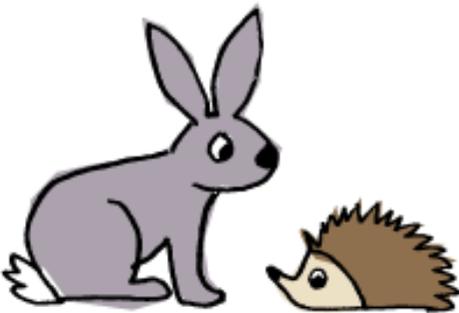




THE PARAGON
JUNIOR
BATH

How I can help my child with Mathematics in Year 6



At The Paragon, we make Maths come alive by showing how important it is in everyday life - a vital tool in working out how long it's going to take to save up for that new computer game or measuring the ingredients for a chocolate cake.

We strive to develop a positive attitude to Mathematics as an interesting and purposeful subject in which all children can gain a degree of success and pleasure.

An important role of any parent is to support this positive attitude towards Maths. In this way, pupils at The Paragon can develop a secure understanding of Mathematical concepts and processes, combined with a genuine procedural fluency and joy in the subject.

Always begin by asking your child what they already know. It is important that children are learning with consistency whether at home or in school. If you are unsure of how to best support your child's understanding of a mathematical concept, class teachers are more than willing to answer any questions.

On the following pages you will find many of the methods and thinking that we introduce and encourage in class. More able mathematicians will often develop their own processes and recording methods. This is encouraged but we do stress the importance of clearly recording all key steps towards a solution.

Algebra

Solve simple equations:

It is important to consider the equation a balance – to discover the value of the unknown we must do the same to both sides of the equation.

$$\begin{array}{r}
 3x - 1 = 2x + 3 \\
 (-2x) \quad (-2x) \\
 \hline
 x - 1 = 3 \\
 (+1) \quad (+1) \\
 \hline
 x = 4
 \end{array}$$

Remainders

Given as a fraction:

$$\begin{array}{r}
 137 \text{ r } 5 \\
 7 \overline{) 964} \\
 \underline{7} \\
 26 \\
 \underline{21} \\
 54 \\
 \underline{49} \\
 5
 \end{array}$$

This would give the solution $137 \frac{5}{7}$

Given as a decimal:

$$\begin{array}{r}
 035.5 \\
 4 \overline{) 142.20} \\
 \underline{4} \\
 102 \\
 \underline{80} \\
 220 \\
 \underline{200} \\
 20
 \end{array}$$

Time

To calculate time passing

Since time does not work in base 10, conventional add and subtract column methods are not valid. We encourage a counting on/counting back method

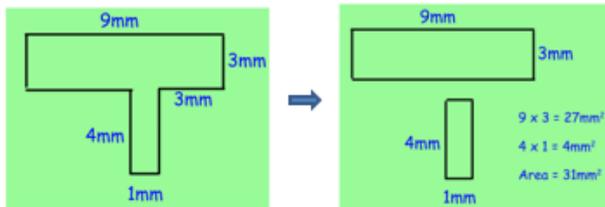
Eg Grandpa takes a nap at 2:32pm and sleeps until 4:19pm. For how long was he asleep?



Area

Break up compound shapes into simple shapes

Breaking up a compound shape area into simple shapes allows you to calculate two separate areas to add together...



Addition

Using place value

Partitioning

e.g. $2.4 + 5.8$ as $2 + 5$ and $0.4 + 0.8$ and combine the totals: $7 + 1.2 = 8.2$

Record addition using the column method:

$$\begin{array}{r} 15.68 \\ + 27.86 \\ \hline 11.1 \\ \hline 43.54 \end{array}$$

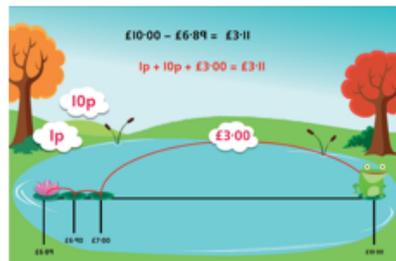
Subtraction

Counting up

Find a difference between two numbers by counting up from the smaller to the larger.

Record subtraction using the column method:

$$\begin{array}{r} 55.81 \\ - 13.8 \\ \hline 42.01 \end{array}$$

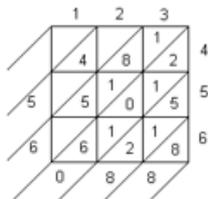


Multiplication

Using number facts

Use times-tables facts up to 12×12 to multiply multiples of 10/100 of the multiplier

e.g. $4 \times 6 = 24$ so $40 \times 6 = 240$ and $400 \times 6 = 2400$

Record multiplication using Napier's Bones: $123 \times 456 = 56,088$ 

Division

Using number facts

Use division facts from the times-tables up to 12×12 to divide multiples of powers of 10 of the divisor

e.g. $3600 \div 9$ using $36 \div 9$

Record division using the 'bus stop' method: $79 \div 3 = 26 \text{ r } 1$

$$\begin{array}{r} 26 \text{ r } 1 \\ 3 \overline{) 79} \\ \underline{6} \\ 19 \\ \underline{18} \\ 1 \end{array}$$

Percentages

Calculate a % of b

At Year 6 level percentages are calculated using 10% as the starting point.

Know that 10% is $\frac{1}{10}$

Eg. Find 35% of 230

$$10\% + 10\% + 10\% + 5\% = 23 + 23 + 23 + 11.5 = 80.5$$

Write a/b as a percentage

This uses knowledge of fractions and requires manipulation so that the denominator is 100.

Eg. Find 19 out of 25 as a percentage

$$\frac{19}{25} = \frac{76}{100} = 76\%$$



Fractions

Equivalent Fractions

Use times table facts to simplify and manipulate fractions:

$$\frac{2}{3} = \frac{6}{9}$$



$$\frac{15}{55} = \frac{3}{11}$$



Adding and Subtracting Fractions

Use knowledge of equivalent fractions:

$$\frac{2}{7} + \frac{4}{9}$$

$$= \frac{18}{63} + \frac{28}{63}$$

$$= \frac{46}{63}$$

$$\frac{2}{3} - \frac{3}{5}$$

$$= \frac{10}{15} - \frac{9}{15}$$

$$= \frac{1}{15}$$

Practise multiplication regularly at home

Children are competing against themselves

First aim- get as many as possible correct

Second aim-time how long this takes and try to beat time

$10 \times 10 =$

$2 \times 10 =$

$1 \times 2 =$

$5 \times 10 =$

$9 \times 10 =$

$2 \times 2 =$

$3 \times 8 =$

$8 \times 10 =$

$1 \times 4 =$

$1 \times 5 =$

$9 \times 9 =$

$1 \times 10 =$

$2 \times 6 =$

$1 \times 6 =$

$1 \times 1 =$

$4 \times 8 =$

$5 \times 9 =$

$7 \times 9 =$

$6 \times 8 =$

$1 \times 3 =$

$4 \times 10 =$

$7 \times 8 =$

$5 \times 6 =$

$4 \times 7 =$

$3 \times 7 =$

$2 \times 8 =$

$3 \times 4 =$

$2 \times 4 =$

$2 \times 7 =$

$5 \times 5 =$

The '55' Club

$4 \times 6 =$

$8 \times 8 =$

$3 \times 5 =$

$5 \times 8 =$

$2 \times 9 =$

$4 \times 5 =$

$4 \times 9 =$

$8 \times 9 =$

$2 \times 5 =$

$6 \times 10 =$

$1 \times 8 =$

$3 \times 9 =$

$1 \times 9 =$

$3 \times 3 =$

$4 \times 4 =$

$6 \times 7 =$

$2 \times 3 =$

$7 \times 7 =$

$6 \times 6 =$

$3 \times 6 =$

$7 \times 10 =$

$9 \times 6 =$

$3 \times 10 =$

$1 \times 7 =$

$5 \times 7 =$

By the end of Year 6 most children will be able to:

- Read and write numbers up to 5 digits and place them on a number line
- Understand place value of numbers up to 5 digits, compare them using $<$ $>$
- Understand place value in decimals to 2 places, place them on a number line
- Compare and order decimals (up to 2 places)
- Round decimals to the nearest whole number
- Round 5 digit numbers to the nearest 10,100,1000
- Write a decimal between two consecutive whole numbers
- Write a one place decimals between two 2-place decimals
- Read and write numbers up to 6 digits and place them on a number line
- Compare and order 6 digit numbers
- Find numbers that lie between 6 digit numbers
- Round two place decimals to the nearest tenth and whole number
- Count up in fractions – use equivalence
- Read and write decimal numbers to 3 places, compare them on a number line
- Understand that the third decimal place represents 1000ths, $0.001=1/1000$
- Understand that negative numbers are less than zero
- Use negative numbers in the context of temperature
- Write dates using Roman numerals
- Know all times table facts up to $12x$
- + and - multiples of 10,100,1000 to numbers to 5 digits
- Add 4 digit numbers using column addition
- Add and take 2 digit numbers using mental strategies
- Know and use bonds to 100
- \times numbers with up to 2 decimal places by 10,100; explain the effect
- \div numbers with up to 2 decimal places by 10,100; explain the effect
- + and – 0.1 to/from one place decimal numbers
- + and – 0.01 to/from two place decimal numbers
- \times 2 and 3 digit numbers by 4 by doubling twice
- \div 2 and 3 digit even numbers by 4 by halving twice
- Use mental strategies to \times by 20, 25
- Use mental strategies to \times by 9
- Use the fact that \times is commutative to change the order in a \times calculation
- Subtract 4 digit numbers using vertical subtraction with decomposition
- Subtract 4 digit numbers using mental strategies of counting up
- Check subtraction by doing addition
- Find the change from a multiple of £10 using counting up
- Recognise which numbers are divisible by 2,3,4,5,6,9,25
- Understand the words multiple and factor, find factors of numbers up to 40
- \times 3 and 4 digit numbers by a single digit using short division

- Use rounding to estimate products
- $\div 3$ and 4 digit numbers by a single digit using short division
- Express division remainders as a fraction
- Use function machines
- Understand that \times and \div are inverses and that $+$ and $-$ are inverses
- \times and \div numbers (incl 2 place decimals) by 10,100,1000
- Add one place decimals using mental strategies
- Mentally add to two place decimals up to the next whole number
- Use mental strategies to solve missing number sentences
- Use rules of divisibility for 2,3,4,5,9,10
- Find factor pairs for numbers up to 50
- Identify prime numbers
- Find square numbers and square roots
- Use mental strategies to divide and \times
- Add money using £. notation and column addition
- Add 2 place decimals using column addition
- Subtract 2 place decimals by using counting up
- \times pairs of 2 digit numbers using a written method
- Use rounding to estimate answers
- Use short division with remainder to $\div 3$ and 4 digit numbers by a single digit
- Use short multiplication to $\times 3$ and 4 digit numbers by single digit
- Add combinations of 2,3,4 digit numbers in column addition
- Add money (written as 2 place decimals) by rounding and adjusting
- Add several amounts of money using mental strategies
- Subtract several amounts of money (give change) using mental strategies
- Solve word problems using the mental $+$ and $-$ of money
- Begin to use a long \times method to $\times 2, 3$ and 4 digit numbers by teen numbers
- \times and \div numbers by 10,100,1000 using 3 place decimals in the calculations
- $+$ numbers up to 5 digits using written column addition
- Subtract numbers up to 5 digits using written column subtraction
- Carry out short division and give the remainder as a fraction
- Find cube numbers up to 6^3
- Classify angles as acute, obtuse or reflex
- Use a protractor to measure and draw angles to 180 in degrees
- Recognise that angles on a line total 180° , solve related problems
- Know that angles around a point total 360° , solve related problems
- Identify and name parts of a circle: radius, diameter, circumference
- Draw circles to a given radius using compasses
- Measure parts of a circle using a ruler or string
- Relate angles to turning and know that 360° is a complete turn
- Solve problems related to turning
- Identify different types of triangles (scalene, isosceles, equilateral, r-angled)
- Sort triangles according to their properties using a Venn diagram
- Know that the angles of a triangle total 180°

- *Identify and name different regular and irregular polygons*
- *Identify parallel and perpendicular lines*
- *Draw polygons using dotted, squared and isometric paper*
- *Identify different types of quadrilateral by considering their properties*
- *Draw regular polygons and explore their properties*
- *Draw 2D shapes using given dimensions and angles*
- *Identify 3D shapes from 2D representations*
- *Create 3D shapes from 2D nets*
- *Draw 3D shapes to create a 2D representation*
- *Draw and interpret a line graph (eg in context of miles/km)*
- *Understand that intermediate points on a line graph have meaning*
- *From line graphs, understand the idea of constant rate*
- *Solve problems involving rate*
- *Read and mark coordinates in the first quadrant*
- *Draw polygons in the first quadrant*
- *Translate shapes in the first quadrant noting what happens to the coordinates*
- *Read and mark coordinates in the first and second quadrant*
- *Reflect simple shapes in the y axis noting what happens to the coordinates*
- *Reflect shapes in other vertical lines*
- *Reflect shapes in lines parallel with the x axis*
- *Tell the time using the 12 hour clock using am and pm*
- *Tell the time using the 24 hour clock*
- *Convert between the 12 and 24 hour clocks*
- *Find the time a given number of minutes/hours and mins later*
- *Read a timetable which uses 12 hour times*
- *Read a timetable which uses 24 hour times*
- *Calculate time intervals from a timetable (incl more than an hour)*
- *Measure lengths and find perimeters in mm and cm*
- *Convert between mm and cm*
- *Convert between cm and m*
- *Convert between g and kg*
- *Use scales to weigh items to the nearest $\frac{1}{2}$ division*
- *Convert between l and ml*
- *Convert between m and km*
- *Understand that distance is measured in km and miles*
- *Use a ready reckoner/line graph to convert between km and miles*
- *Name commonly used imperial units and relate them to daily life*
- *Use a tape measure to measure to the nearest cm*
- *Calculate the area and perimeter of rectangles*
- *Estimate the area of irregular shapes*
- *Calculate the area of compound shapes by making rectangles*
- *Use the area and perimeter of rectangles to find missing side lengths*
- *Understand that volume is measured in 3 dimensions*
- *Find the volume of a cuboid by counting cubes*

- *Find the volume of a cuboid by multiplying the three dimensions*
- *Understand the relationship between volume and capacity*
- *Use a scale factor to find new dimensions*
- *Make a scale model*
- *Appreciate the real life applications of scale drawing and models*
- *Compare fractions with the same numerator*
- *Compare fractions with different denominators*
- *Reduce fractions to simplest form*
- *Recognise equivalent fractions*
- *Place fractions on a number line*
- *Recognise common equivalent fractions/decimals: $\frac{1}{2}, \frac{1}{10}, \frac{1}{100}, \frac{1}{5}$*
- *Find unit fractions of amounts up to 3 digits*
- *Find non-unit fractions of amounts up to 3 digits*
- *Place mixed numbers on a number line*
- *Write improper fractions as mixed numbers and vice versa*
- *X proper fractions by whole numbers*
- *Add and subtract fractions with the same denominator*
- *Add and subtract fractions with related denominators eg $\frac{1}{3} +$ or $- \frac{1}{6}$*
- *Understand percentage and how it relates to $\frac{1}{100}$ ths*
- *Convert % to hundredths, simplifying where possible*
- *Find 1,5,10,50% of money amounts*
- *Use equivalent fractions and % knowledge to solve problems*
- *Identify equivalent fractions, decimals, %*
- *Solve problems involving scaling by simple fractions*
- *Look for patterns in number and shape*
- *Try to explain patterns by asking questions and testing ideas*
- *Make sensible choices regarding calculation methods*
- *Read and gather information from word problems*
- *Answer word problems showing correct and clear method*
- *Present written solutions clearly and logically*
- *Find patterns, establish rules and then test them*
- *Use systematic logic to organise a search for patterns/order*
- *Use mathematical reasoning to explain ideas and to solve problems*
- *Pursue a line of enquiry*

Pupils also have access to ‘DoodleMaths’, a Maths app which develops a tailor made programme for each child. Independent studies with schools have shown that students using ‘DoodleMaths’ for 10-15 minutes daily over the course of 4 weeks make an average improvement of 3.5 months in their Maths age.

Your child will be given a username and password which they can use to log in to the DoodleMaths 7+ or 11+ app, as allocated by your class teacher. We recommend that this is used regularly throughout the year to support their Maths learning at home, alongside their homework.

You can record your child’s log in details here:



Username: _____