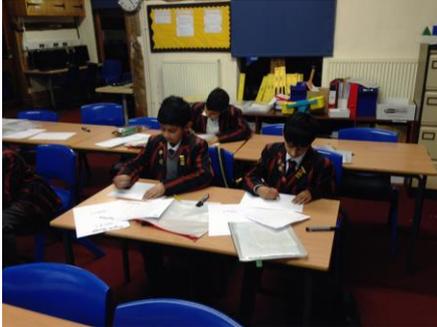


Y5 and upwards Maths Club

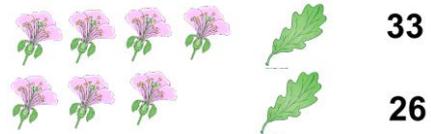
What do we do in the Maths Club? The Club operates from 16 15 to 17 15 on Thursdays. Pupils from Y5 upwards are welcome to join.



Recently we have been looking at some quite advanced Maths. However, this is not done through direct teaching, but by designing tasks for the pupils to work through, mostly collaboratively so that it enhances their abilities to reason, justify, and explain to one another and to the whole group. Here is a flavour of what we do and how we approach problems.

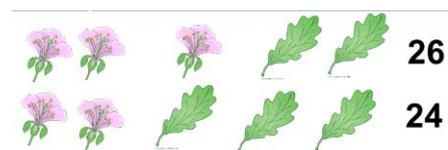
Simultaneous equations (two or more unknowns) by **logic**, rather than through procedural rules:

In the diagram, by comparing the two lines we can conclude that the extra flower in the top line accounts for the extra 7 (33-26), so the flower is worth 7. Therefore, in the 2nd line, the leaf is worth $26 - 3 \times 7 = 5$



In the diagram:

Either (i) a leaf in the 2nd line has been replaced by a flower in the top row – this means that the flower is worth 2 (26-24) more than the leaf. Each of the flowers in the 2nd row can be replaced by a leaf + 2. This substitution in the 2nd row thus gives us that 5 leaves + 4 = 24, from which we deduce that a leaf is worth 4. From the 2nd line we now get that 2 flowers + 12 = 24, therefore the flower is worth 6.



Or (ii) Altogether, the 5 flowers and 5 leaves are worth 50 (26+24); therefore 1 flower + 1 leaf are worth 10 (50/5); therefore, in the 2nd line, 2 flowers + 2 leaves = 20 (2x10), so the remaining leaf is worth 4 (24-20). By using this value for the leaf, we can work out that the flower is worth 6

In the 1st diagram, by comparing the first two lines, we can deduce that the G is worth 4 (16-12) more than the Y.

R	Y	12
R	G	16
Y	G	20

So, we substitute both G's with a Y and 4.

In the 2nd diagram, the 3rd row is now of use to us because it has only one unknown – we can deduce that if $2Y + 4 = 20$, then $Y = 8$, which leads us to $G = 12 (8+4)$ and $R = 4 (12-8)$

R	Y	12
R	Y	4
Y	Y	4

Or, we can look at the whole thing and conclude that $2R + 2Y + 2G = 48$ and take it from there, as in the flower/leaf example.

Harder example:

In the left diagram, in the 2nd row, 2 cars and 2 cogs are worth 84, so we can deduce that 1 car and 1 cog are worth 42 (84/2).

We can use that fact in the right diagram, if we look at the last column – use the fact that 1 car and 1 cog are worth 42 to work out that the car at the top of that column is worth 17 (59-42) – the rest is easy.

				76
				84
				94
68	60	67	59	

				76
				84
				94
68	60	67	59	

We have also worked with Pythagoras and Pascal's Triangle. We are starting to look at Combinations, such as ways of selecting 2 books from 5 books, and how these link to Pascal's Triangle.

Pythagoras Questions

3
5 cm
6 cm
x

$$x^2 = 5^2 + 6^2$$

$$x = \sqrt{5^2 + 6^2}$$

$$x = 7.8 \text{ cm (1 dp)}$$

Counting numbers
Triangular numbers
Tetrahedral numbers
Square base
Pyramid numbers

B. Westacott (Head of Maths)