Maths Problem Solving Part 3

Have you had enough of working on My Maths?

Would you rather get out some pen and paper and investigate maths problems?

THIS BOOKLET IS FOR YOU!

There are 10 problems for you to make your way through. None of them are quick so be patient and don't give up!

GOOD LUCK!

Perimeter

Which hexagons can you remove to increase the perimeter of the whole shape?
By only removing individual hexagons, what is the largest perimeter the whole shape can have in unit side-lengths? (you must keep the structure as one continuous shape and not break it into 'islands')

Missing Numbers

$$192 \times 4.7 = \underline{\hspace{1.5cm}}$$

$$1920 \times 47 = \underline{\hspace{1.5cm}} \qquad\qquad 193 \times 47 = \underline{\hspace{1.5cm}}$$

$$192 \times 47 = 9024$$

$$\underline{\hspace{1.5cm}} \times 47 = 90.24 \qquad\qquad 192 \times \underline{\hspace{1cm}} = 28\,220$$

$$\underline{\hspace{1.5cm}} \times 47 = 90\,710$$

Based on the equation in the middle of the diagram, can you fill in the gaps in the other equations using derived facts?

Percentages

Flynn's Electronic Emporium is holding an 'Everything for £35' day, where every item is on sale for (you guessed it!) £35.

20% profit   ???   20% loss

A customer bought a keyboard, speakers and webcam. The shop made 20% profit on the keyboard and 20% loss on the webcam. Overall the shop broke exactly even (to the nearest penny).

Did the speakers sell for a loss or a profit and by how much?

Nuts

Sally the squirrel is collecting nuts for the winter. She starts collecting on Monday but the nuts are becoming harder to find, so every day she collects four fewer nuts than she collected the previous day.

By the end of Friday, she has collected a total of 165 nuts.

How many nuts did she collect on Wednesday?

Missing Vowels

We've taken the vowels out of these mathematical terms.
Can you figure out the full terms?

MGCSQR

CRDNT

PLCVL

NMBRLN

DDCGN

Digits

Three different digits are represented by:

A, B, C

The three-digit number ABC is odd and divisible by 5

The three-digit number ACB is even and **not** divisible by 5

The two-digit number AC is divisible by 7

The two-digit number BA is prime

What digits could B represent?

Fireworks

Sam's school is having a fireworks display. They have four types of firework, each has a different number of stars.
To make the best display for their celebration they would like there to be 48 stars in the sky at once.

Which fireworks should they use for 48 stars?

Trouble Sleeping

I'm having trouble sleeping.
I look at my clock and notice the time is 01:32

01:32

To amuse myself, I try and work out how many minutes it will be until the next time the clock shows all the digits 0, 1, 2 and 3.
What is the answer?

Further challenge: what are the gaps in minutes between the next four times showing 0, 1, 2 and 3?

01:32, __:__ , __:__ , __:__ , __:__ , __:__
? ? ? ? ?

This document will help you to...
Investigate Mathematical Problems!

Beans

If you took all the beans in a can and lay them end to end, how long would that chain of beans be?

Countdown

Use the numbers available to make the total required.
You can add, subtract, multiply and divide.
You can only use a number once but you do not need to use every number.