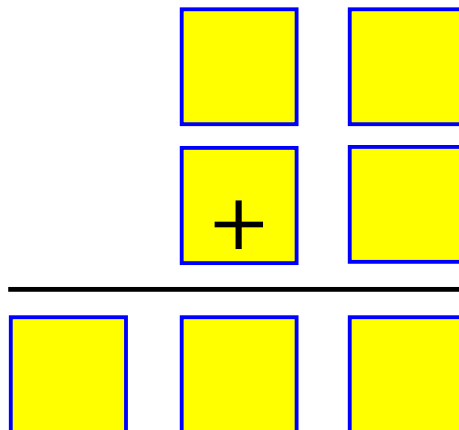




INVESTIGATION



Crazy addition



MathSphere

Crazy addition Investigation

Starter

For this investigation you need a set of 0 - 9 cards.

Use any six of the cards to make this sum correct. Only one number can go in each box.

$$\begin{array}{r} \square \square \\ + \square \\ \hline \square \square \square \end{array}$$

Think about it - a two digit number plus a single digit gives a three digit answer.

(You can not place the 0 in the hundreds column in the answer!)

How many different ways can you find of doing this?

What is the highest total you can make?

What is the lowest total you can make?

Investigate.

Some Ideas

Work in a methodical way, recording your results carefully as you go.

Think about how to set out your results clearly.

Try to find as many rules and patterns as you can - what has to happen to make the sum possible?

Can you be sure that you have got all the possible numbers?

What would happen if you were allowed to use a number twice?

What would happen if you changed the addition sign to a multiplication sign?

What would happen if you tried to use all ten digits in a layout like this:

$$\begin{array}{r} \square \square \square \\ + \square \square \square \\ \hline \square \square \square \square \end{array}$$

Answer Guide

A good class starting point for this investigation would be to place the sum on the board, or an OHP, and by trial and error see if a solution can be reached.

With some logical thinking children should realise that for the answer to be in the hundreds then the tens digit has to be a 9. Also the hundreds digit has to be 1 (there may be some pupils who use a zero in the hundreds - use this as a discussion point).

Working on from this, the zero has to go in the tens column of the answer. This leaves these possibilities:

98	98	98	98	97	97
$\begin{array}{r} + 7 \\ 105 \end{array}$	$\begin{array}{r} + 6 \\ 104 \end{array}$	$\begin{array}{r} + 5 \\ 103 \end{array}$	$\begin{array}{r} + 4 \\ 102 \end{array}$	$\begin{array}{r} + 8 \\ 105 \end{array}$	$\begin{array}{r} + 6 \\ 103 \end{array}$

97	96	96	95	95	94
$\begin{array}{r} + 5 \\ 102 \end{array}$	$\begin{array}{r} + 8 \\ 104 \end{array}$	$\begin{array}{r} + 7 \\ 103 \end{array}$	$\begin{array}{r} + 8 \\ 103 \end{array}$	$\begin{array}{r} + 7 \\ 102 \end{array}$	$\begin{array}{r} + 8 \\ 102 \end{array}$

From this starter there are a number of opportunities for extension: using the multiplication sign is a good investigation for group work - a calculator may aid the less confident.