

Exasperating 80 grand

Children use the digits 0 to 9 only to create pairs of five-digit numbers, with a total as close to 80,000 as possible.

Skills practised:

- Using column addition to add pairs of five-digit numbers
- Estimating totals

Conjecture: It is possible to get within 100 of 80,000 by adding a pair of five-digit numbers using the digits 0 to 9 only once.

What to do:

Children work individually or in pairs.

1. Use the digits 0 to 9 once only to create a pair of five-digit numbers. Use column addition to find the total, e.g.

$$\begin{array}{r} 73458 \\ + 12096 \\ \hline 85554 \end{array}$$

2. Your challenge is to create a pair of five-digit numbers with a total as close to 80,000 as you can! Can you get an answer within 100 of 80,000?

HINT: In the example above, the number of 1000s is $73 + 12 = 85$, so the person who wrote this addition could improve on that. What do the ten thousand and thousand digits need to sum to? If they add up to 80, what will happen when you add the two whole numbers together? What if the ten thousand and thousand digits have a total of 79? What do the next pair of remaining digits need to sum to?

3. Come up with your own target total of a multiple of 10,000. Use what you have learned to come up with a pair of numbers with a total as close to that number as possible. Is it easier to get answers close to some multiples of 10,000 than others?

Aims:

- To consider the effect of 'carry' digits on totals when using column addition
- To use estimation, trial and improvement to work closer to a given total

Minimum number of calculations expected

10