Objective: Solve multi-step problems involving all four operations in context, deciding which operations and methods (including mental and efficient jottings and diagrams) to use and why.

- **Year 5 Task 4:**

This task is taken from the NRich website. To view the task, follow the link:
https://nrich.maths.org/1013?utm_source=primary-map **Included on the website are tips on how to get started and worked solutions.**
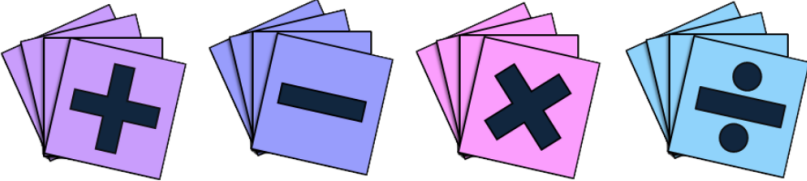
Make 100

Age 7 to 11 ★★

Find at least one way to put in some operations signs ($+$, $-$, $\times$, $\div$) to make these digits come to 100.

$$1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad 7 \quad 8 \quad 9 \quad = \quad 100$$

Getting started

One way of beginning to tackle this problem is just to add the numbers together. This gives a total which is less than 50. If we consider which other operations we could use to make our total larger multiplication would seem to be a good option.

We could try multiplying the largest two numbers:

8 x 9 = 72

We could now add this total to the remaining numbers:

1 + 2 + 3 + 4 + 5 + 6 + 7 = 28

72 + 28 = 100

Another way to record this would be:

1 + 2 + 3 + 4 + 5 + 6 + 7 + (8 x 9) = 100

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Here is another possibility using addition, multiplication and subtraction:

1 + 2 + 3 + 4 + 5 = 15, 15 x 6 = 90, 90 – 7 = 83, 83 + 8 = 91, 91 + 9 = 100

Now have a go for yourself and see what you can do!

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Examples of solutions and strategies from the NRich website:

$6 + 1 = 7$, $7 \times 7 = 49$, $9 \times 5 = 45$, $49 + 45 = 94$, $7 + 8 = 15$,
$2 + 3 + 4 = 9$, $15 - 9 = 6$, $94 + 6 = 100$

$6 + 5 = 11$, $11 \times 7 = 77$, $4 + 3 + 9 + 8 = 24$, $24 - 2 = 22$, $22 + 1 = 23$,
$77 + 23 = 100$

$6 + 7 = 13$, $13 \times 5 = 85$, $9 + 8 = 17$, $17 - 4 = 13$, $13 + 3 = 16$,
$16 - 2 = 14$, $14 + 1 = 15$, $85 + 15 = 100$

$4 + 3 = 7$, $7 \times 9 = 63$, $8 \times 6 = 48$, $5 \times 2 = 10$, $48 - 10 = 38$, $38 - 1 = 37$,
$63 + 37 = 100$

$4 + 5 = 9$, $9 \times 6 = 54$, $7x3 = 21$, $21 + 9 = 30$, $2 \times 8 = 16$, $30 + 16 = 46$,
$46 \times 1 = 46$, $46 + 54 = 100$

$4 + 6 = 10$, $10 \times 7 = 70$, $7 + 8 = 15$, $15 + 9 = 24$, $24 + 5 + 2 = 31$,
$31 - 1 = 30$, $70 + 30 = 100$

$4 + 7 = 11$, $11 \times 3 = 33$, $9 \times 6 = 54$, $8 \times 1 = 8$, $54 + 8 = 64$, $64 + 5 = 69$,
$69 - 2 = 67$, $67 + 33 = 100$

$(1 + 9)(2 + 8)((7 - 3) \div 4)(6 - 5) = 100$

$((1 + 2 + 3 + 4) \times (5 + 6)) + 7 - 8 - 9 = 100$

Here are some of the accounts that described the all-important processes that were used.

We started it by picking out two numbers and multiplied them together to get an answer and then we multiplied another pair of numbers to get an answer and added them together to get 87 and added the remaining digits to get a subtotal of 100. (Courtney and Michelle from Denfield Park Junior School)

We needed to get the biggest possible number so we multiplied the biggest numbers (9 and 8). Then we added all the other numbers up in random order. We found we reached 100 using every number.(Nadia and Millie, Greenacre School for Girls)

Our aim was to get to 50 and double it, so we timesed 7 by 9 to get to 63 and then minused it down to 60 and then down to 50. Then we timesed by 2 to get 100. (Karla and Gemma, Greenacre School for Girls)

We thought it would be good to start with number bonds to 10. As we only had one 5, we decided to use the other four number bonds to 10 ($6 + 4$, $7 + 3$, $1 + 9$, $2 + 8$), and then use addition and subtraction to make 20 and then times that by 5 to get to 100. (Maddie and Harriet A., Greenacre School for Girls)

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