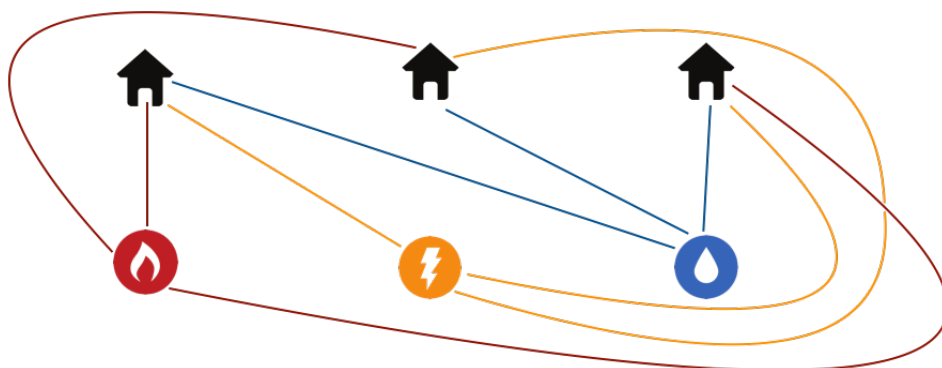


# Puzzles from the Team!

## SOLUTIONS

### MAKING CONNECTIONS

#### Sam's Puzzle

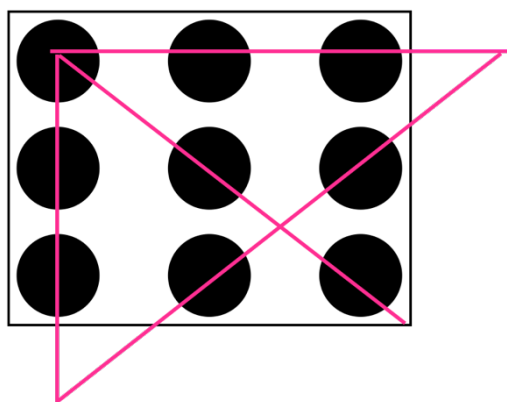


This is one 'almost solution', but there are other ways of doing it.

Now, you can re-create the 'almost solution' on the surface of a mug, using a pen that rubs off. If you can work out how to use the handle to get rid of the crossing point, you can show that the Utilities Puzzle can be solved on the surface of a mug!

You can draw the houses and utilities on the mug (eg as dots). Or you can print off some of our utilities puzzle stickers!

Stickers File (designed to be printed on Avery L7160-40 labels – can be bought on Amazon), to be stuck on a mug so you can solve the Utilities Puzzle on a mug: <https://think-maths.co.uk/wp-content/uploads/2024/11/Utilities-Puzzle-stickers-for-Avery-L7160-40-labels-sheet-of-21.pdf>



#### Ashleigh's Puzzle

This (or a rotation or reflection of this) is the solution with 4 lines.

It's not possible with 3 lines.

## MATHS IN HISTORY

### Brigitte's puzzle

The Mary Somerville bust was in the library.

## PLAYING WITH NUMBERS

### Goran's Puzzle

We've made two solutions to this one.

If you tried this with only add, subtract, multiply and divide, the highest number is made by doing the following:

$$\begin{aligned}2 + 1 &= 3 \\5 \times 3 \times 2 &= 30\end{aligned}$$

If you used the operators above and also powers, the highest number that can be made is:

$$\begin{aligned}1 + 5 &= 6 \\2^6 &= 64 \\2^{64} &\approx 1.84 \times 10^{19}\end{aligned}$$

This means about 1,840,000,000,000,000,000

There are some other operations that can be used to get an even bigger number, which you might meet if you study more maths as you get older!

### Sam's Second Puzzle

Prime numbers between 80 and 100 are: 83,89,97

## LATERAL THINKING

### Mike's Puzzle

You are looking at the numbers upside down. So, they are consecutive numbers from 86 to 91, and the car is parked in place 87.

### Goran's Second Puzzle(s)



The symbols are the whole numbers from 1 and their mirror image, then all rotated 90 degrees anti-clockwise. This puzzle appeared in an episode of the Simpsons!

1,  
1,1  
2,1  
1,2,1,1,  
3,1,1,2  
1,3,2,1,1,2

A line of the sequence describes how many of each number in the line before.

For example, the second line is '1,1' and that's because there was 1 instance of the digit 1 in the line above. There was 'one 1' in the line above.

The missing line is '1,3,2,1,1,2' because there was one 3, two 1s, and one 2 in the line before