# Open Ended Tasks

These are open ended questions and are not intended for use in a competition format.

It is expected that these will be used in the classroom with groups of pupils and would foster research on the part of the pupils (and maybe the teacher!).

Some guidelines are given but the intention is for the pupils to do some research by whatever means is appropriate, other than simply asking someone else.
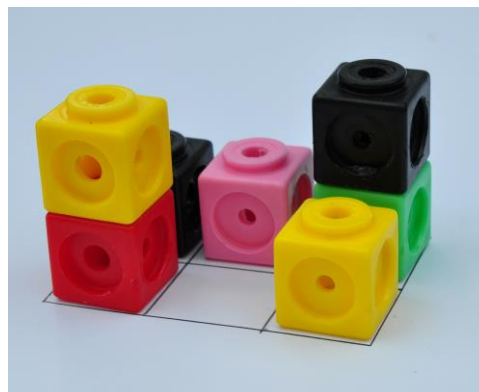
# Task One

## Towers

Little boxes, little boxes… made of ticky, tacky!

Place five multi-cubes into a three by two grid. How many different ways can you do this?



Now take two more cubes. How many different two -storey houses can you make?



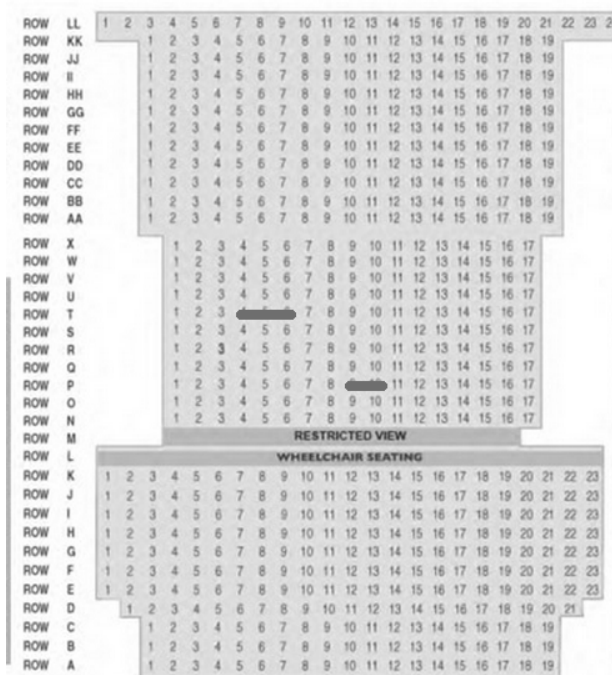Now take two more cubes. How many different three-storey houses can you make?

# Task Two

## At the cinema recently

Five of us, Alan, Betty, Colin, Diane and Elli, arrive late and there are few seats left. Luckily, there are five seats available, two together on row P and three together on row T.

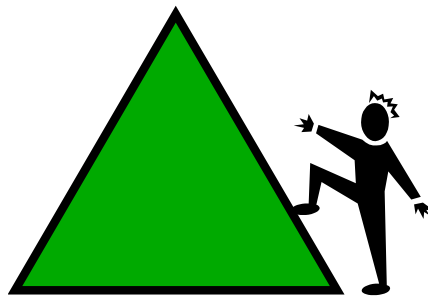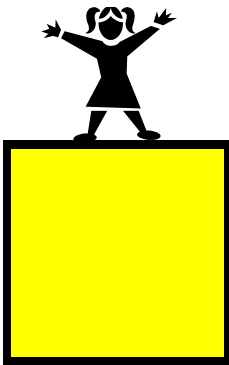In how many different ways could we have sat through the film?



| Seat numbers | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Row T | x | x | x | Alan | Colin | Elli | x | x | x | x |
| | x | x | x | x | x | x | x | x | x | x |
| | x | x | x | x | x | x | x | x | x | x |
| | x | x | x | x | x | x | x | x | x | x |
| Row P | x | x | x | x | x | x | x | x | Betty | Diane |

# Task Three

## Square cutting

Can a square be cut up into triangles, each of which is acute-angled?
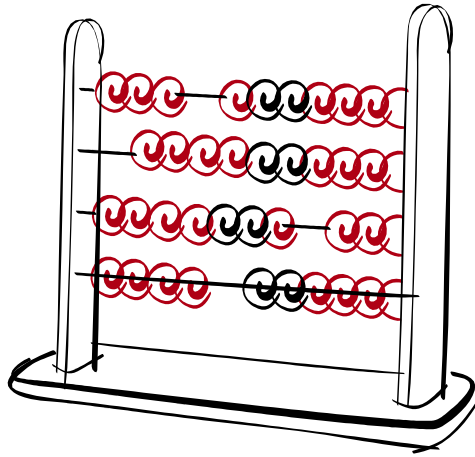
## Task Four

<u>1089 and all that!</u>

The value of $623 + 466$ is 1089.

How many other 'sums' can be found that total 1089?

## Task Five

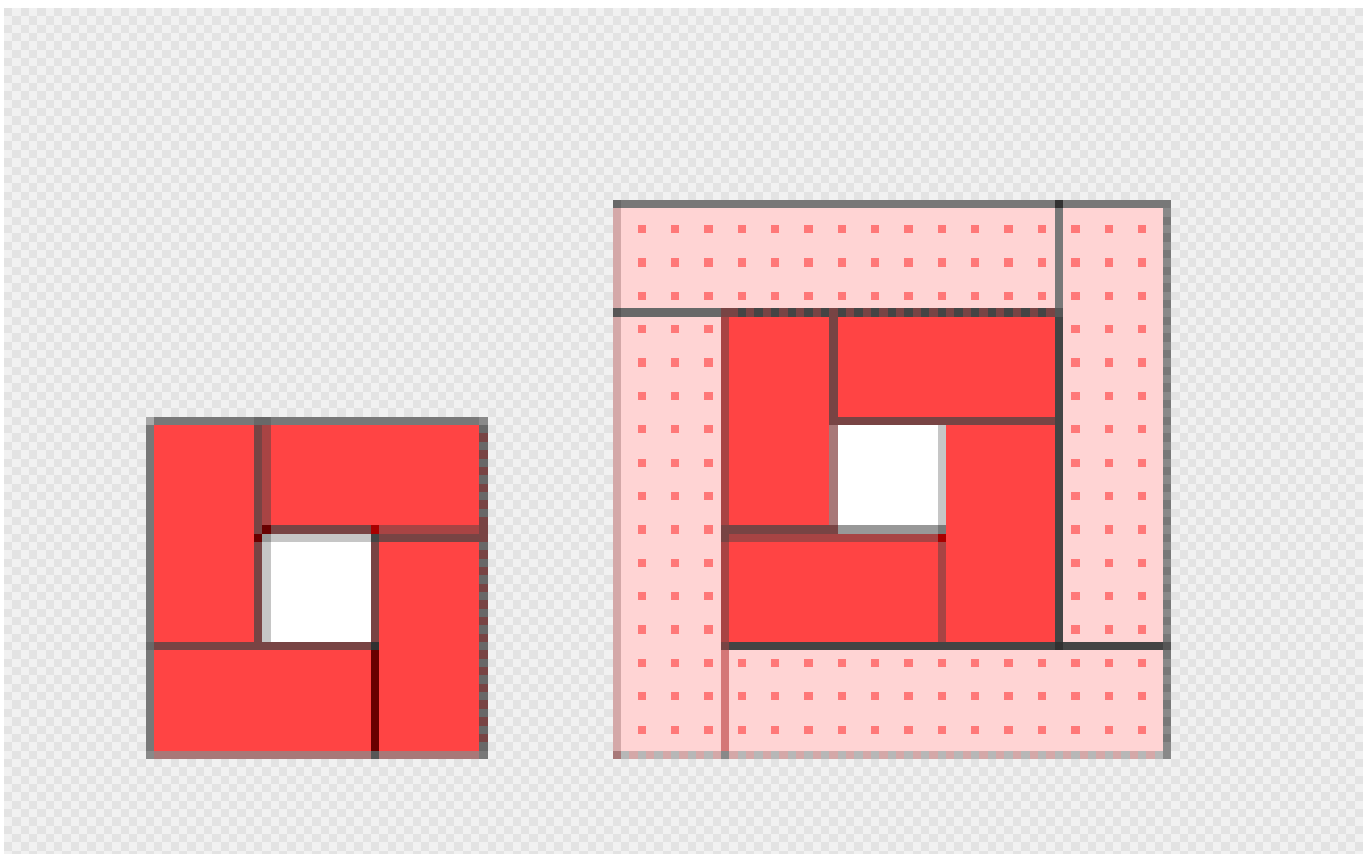All the digits, one to nine.
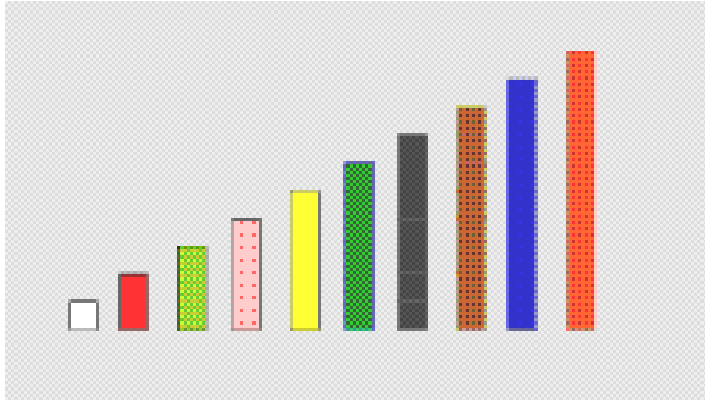
$$12 + 34 + 56 + 7 - 89 = 20$$

$$1 + 2 + 345 - 67 - 89 = 192$$

Using addition and subtraction only, what numbers can be 'made' using all the digits, one to nine?
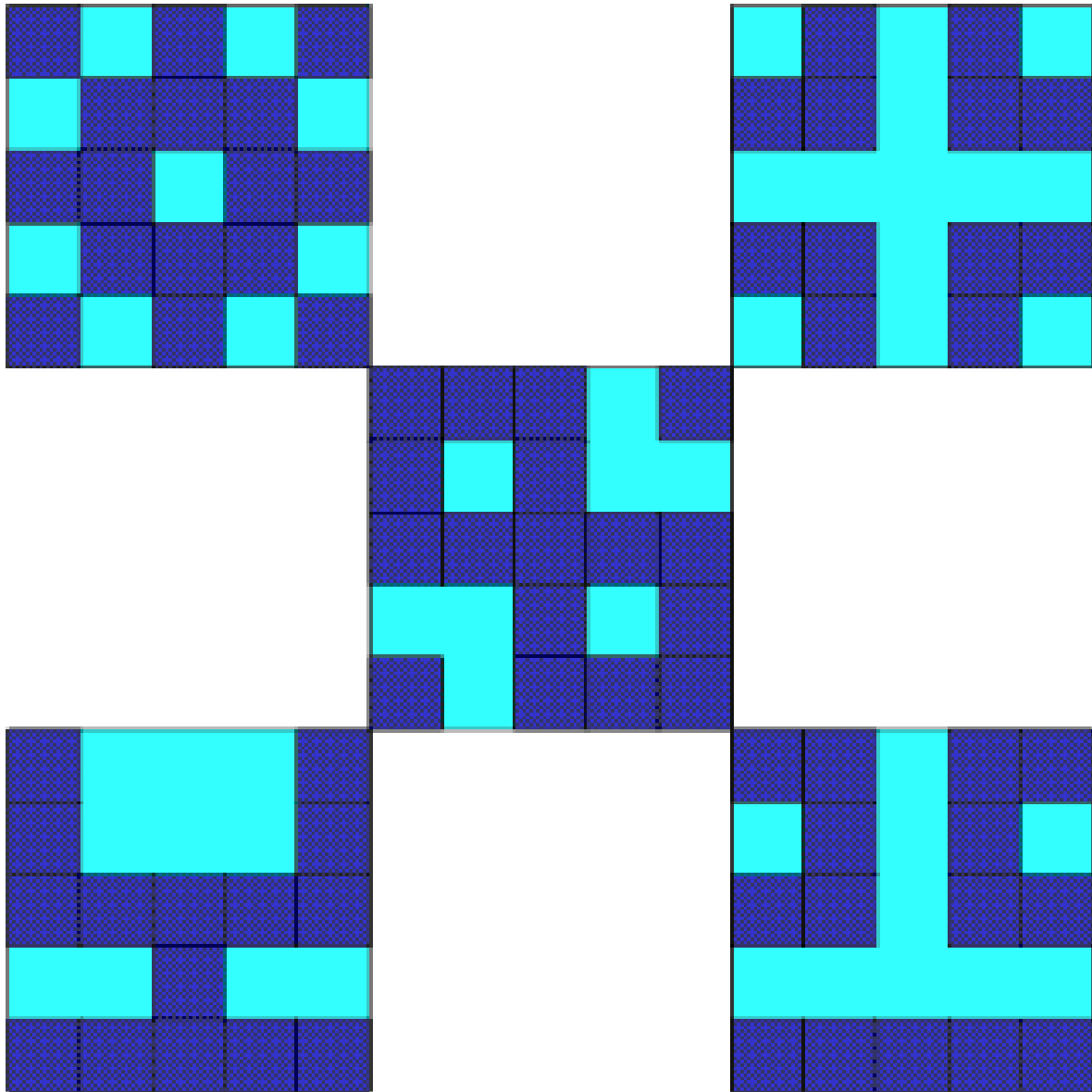
What numbers can't?

# Cuisenaire Rods



What are the next two arrangements?

# Birte's Squares



How many more symmetric designs can
you create bin a 5 by 5 array?