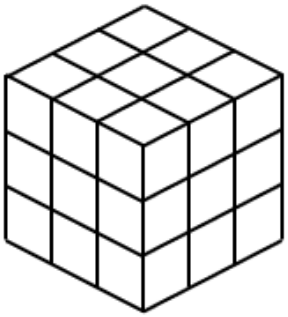
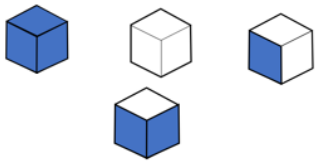
Painting Cubes

A 3 x 3 x 3 cube has its outside sprayed with paint.

It is then broken into 27 smaller cubes.

The smaller cubes have different numbers of faces that are painted.





How many of the smaller cubes have all 3 of their faces painted?

How many of the smaller cubes have 2 of their faces painted?

How many of the smaller cubes have 1 of their faces painted?

How many of the smaller cubes have none of their faces painted?

What if the original cube had been 10 x 10 x 10?

Can you find a formula to link the size of the cube with the number of cubes with 0, 1, 2 or 3 faces painted?