

Cubes and Dices

Introduction:

Cubes and cuboid:

- In a cube or a cuboid there are six surfaces, 8 corners and 12 edges in each.
- In a cube length, breadth and height are same while in cuboid these are different.
- In a cube the number of unit cubes = (side)³.
- In cuboid the number of unit cube = (l x b x h).

If a cube is painted its surfaces with a same/different color

$n = (\text{side of big cube} / \text{side of small cube})$

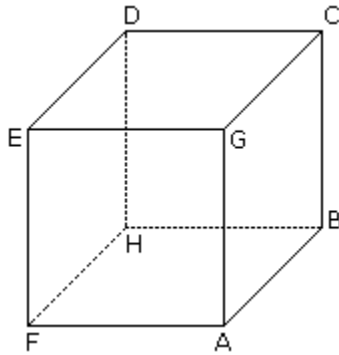
- the No. of pieces of smaller cubes with 3 surfaces painted = number of corners = 8
- the No. of pieces of smaller cubes with two surfaces painted = $(n - 2) * \text{number of edges} = (n - 2) * 12$
- the No. of pieces of smaller cubes with one surface painted = $(n - 2)^2 * \text{number of surfaces} = (n - 2)^2 * 6$
- No. of pieces of smaller cubes with no surface painted = $(n - 2)^3$

Generally paintings of the big cube can be classified as :

- All the surfaces of the cube with the same color.
- All surfaces of the cube with different colors .
- Two pairs of opposite surfaces of the cube are painted.
- Only one pair of opposite surfaces of the cube are painted.
- Two pairs of adjacent surfaces of the cube are painted.
- One pair of adjacent surfaces of the cube are painted.

Dices :

Dices are three dimensional figures, which can be either cubes or cuboids.



There are 6 faces in the cube - ABCG, GCDE, DEFH, BCDH, AGEF and ABHF.

Always four faces are adjacent to one face. Opposite of ABCG is DEFH and so on.

CDEG is the upper face of the cube.

ABHF is the bottom of the cube.

The labeling of the six faces of the dice can be done as follows:

