Surface Areas and Volume of a Cuboid and Cube Ex 18.1 Q6

Answer :

Let,

$a \rightarrow$ Side of each cube

$S_1 \rightarrow$ Surface area of each cube

So, $S_1 = 6a^2$

Hence,

Sum of surface areas of three cubes,

$3S_1 = 3 \times 6a^2$

$= 18a^2$

The length (say l) of the newly formed cuboids is;

$l = 3a$

Its breadth (say b) and height (say h) will be the same as that of each cube.

$b = a$

$h = a$

Total surface area of the new cuboids is;

$S_2 = 2(lb + bh + hl)$

$= 2(3a \times a + a \times a + a \times 3a)$

$= 2(7a^2)$

$= 14a^2$

Required Ratio,

$= \frac{S_2}{3S_1}$

$= \frac{14a^2}{18a^2}$

$= \frac{7}{9}$

The total surface area of the new cuboids to that of the sum of the surface area of the three cubes is

$\boxed{7:9}$

Surface Areas and Volume of a Cuboid and Cube Ex 18.1 Q7

Answer :

We can define the following notations as follows

$L \rightarrow$ Side of $4\,\text{cm}$ cube

$V \rightarrow$ Volume of $4\,\text{cm}$ cube

$l \rightarrow$ Side of $1\,\text{cm}$ cube

$v \rightarrow$ Volume of $1\,\text{cm}$ cube

Let;

$n \rightarrow$ Number of cubes formed

$s \rightarrow$ Surface area of a single small cube

We know,

$$V = L^3$$
$$= 4^3$$
$$= 64\,\text{cm}^3$$

And;

$$v = l^3$$
$$= 1^3$$
$$= 1\,\text{cm}^3$$

The number of cubes formed,

$$n = \frac{V}{v}$$
$$= \frac{64}{1}$$
$$= 64$$

Total surface area of all the small cubes formed

$$= n \times s$$
$$= 64 \times \left(6l^2\right) \qquad \left\{s = 6l^2\right\}$$
$$= 64 \times \left(6 \times 1^2\right)$$
$$= 384\,\text{cm}^2$$

The total surface area of all the small cubes is $\boxed{384\,\text{cm}^2}$.

********** END **********