

VEDIC MATHEMATICS, SCIENCE & TECHNOLOGY TEACHER COURSE

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CUBE: THE REPRESENTATIVE REGULAR BODY OF 3-SPACE

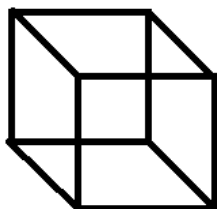
This day the course focus is upon 'Cube, the Representative regular body of 3-space'. Its four aspects being taken up are as follows:

1. Cube
2. Seven versions of cube
3. Eight octaves
4. Three dimensional frame

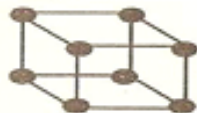
The values being covered are to be taught as lessons numbers 1 to 4 to the students of 3-space Vedic Mathematics, Science & Technology.

LESSON-1

CUBE



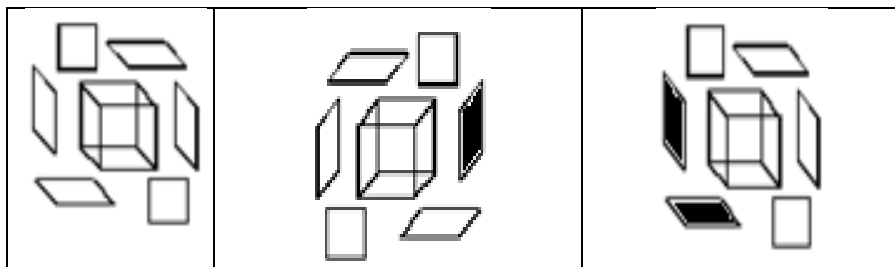
1. Let us visit and revisit the 'cube'.
2. Let us visit and revisit the cube to have a glimpse of its structural set up.
3. It brings us face to face with 'volume' being within a geometric envelop.
4. The geometric envelop of the volume is stitched by
 - (i) 8 corner points
 - (ii) 12 edges, and
 - (iii) 6 surfaces
5. This set up of '8 corner points, 12 edges and 6 surfaces', together make a structural set up of triple features, namely of 'points, lines and surfaces'.
6. Let us visit and revisit 'point, line and surface'.
7. 'Surface' is of features of 'length and breadth'.
8. Here, in case of 'surface', third axis is not play its role.
9. It may be taken as that surface has a pair of axis.
10. Simultaneously it may be view as that here, third axis, namely height is missing.
11. This may be taken as that here there is presence of a pair of axis while there is an absence of one axis.
12. The same may be express as '+2, -1' as that there is a presence of 2 axes and also simultaneously, there is an absence of 1 axis.
13. Now let us visit 'line'.
14. It has length, while area and volume are missing.
15. It is so, as here there is a presence of one axis and there is an absence of 2 Axis.
16. It would permit expression as '+1, -2'.
17. Now let us visit a 'point'.
18. Here, 'Length, Breadth, Volume' are missing.

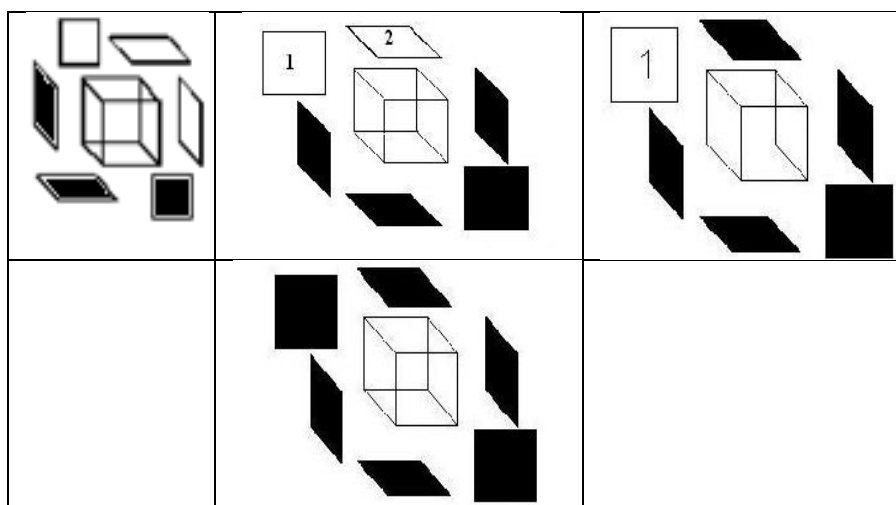


19. In the set up of a point, neither of the 3 axes is playing its role.
20. As such, point permits expression as '0, -3'.
21. One may have a pause here and take note that, 'volume' is the set up where all the 3 axes are playing their roles.
22. It is accepting expression as '3, 0'.
23. One may have a pause here and take note that the above features also bring us face to face with the values as that the cube, with its volumes as one structural component and its geometric enveloped being of $(8+12+6) = 26$ structural component, together make cube as of '27' structural components.
24. These 27 structural components together with 4 structural component of a 3 dimensional frame of 3 dimensions and one origin, shall be leading us to this set up being of $27+4 = 31$ structural components.
25. It would be blissful to take note that NVF (CUBE).
26. It would be blissful to take note that $27 = 3^3$, a third member of the sequence $(1^3, 2^3, 3^3, 4^3, \dots)$. ■

LESSON-2

SEVEN VERSIONS OF CUBE





1. 'Cube' has 6 surface plates.
2. The presence and absence of these surface plate, make a range of following 7 versions:-
 - (i) Cube with its all the six surface plate being intact.
 - (ii) This version permit expression as 6×0 to express about the presence of 6 surface plates and absence of '0' number of plates.
 - (iii) Cube with its only 5 surface plates being intact, and 6th surface plate being absent, makes another versions of the cube which would permit expression as $(5, -1)$ explaining that it is expression to mark the presence of 5 surface plate and absence of 1 surface plate.
 - (iv) Next version on the cube would be with its only 4 surface plate is being intact and remaining 2 surface plates being absent and the same would permit expression as $(4, -2)$.

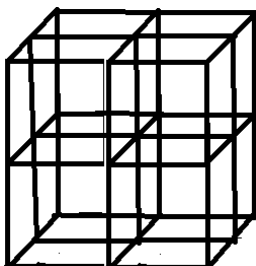
- (v) Like that, we shall be reaching at a range of 7 versions of the cube being (6, 0), (5,-1),(4, -2), (3, -3), (2, -4), (1, -5) and (0, -6)
3. The another way to approach these 7 versions of cube is to view as that the first version of the cube is which is not having any of its surface plates being intact, and then second to seventh version of the cube shall be sequentially having (1, 2, 3, 4, 5 and 6) surface plates intact.
 4. Still another way to glimpse and to reach at this range of seven version range would be begin with the cube which has half number of plates (means, 3 surface plates being intact) and another half number of plates (means, 3 plates) being missing.
 5. Then we can sequentially proceed on either side of the range from (3, -3) version, by having sequential addition and removal of the surface plate for this middle placement version.
 6. Taking, the above middle placement version, being of (3, -3) = 0 signature version, we shall be reaching at 7 signature range of seven versions of the cube being (-3, -2, -1, 0, 1, 2, 3) signature range.
 7. Orientation wise above range may be of expression as (3, 2, 1, 0, -1, -2, -3).
 8. One may have a pause here and take note that these seven versions of cubes, together shall be availing $(6+5+4+3+2+1+0) = 21$ number of surface plates.
 9. It also would be blissful to take note that number value 21 permits re-organization as $21 = 1 \times 3 \times 7 = 3 \times 7$.
 10. It would be blissful to take note that Arthrav Veda in its very first quarter of first mantra enlightens with

formulation ‘trishapta, which laterally means 3 and 7, and one of the value of this formulation brings us face to face with cube, (3-space body), being of seven versions.



LESSON 3

EIGHT OCTAVES



1. It is going to be a blissful exercise to cut a soap-cake (cube) into 8 part (8 sub cubes) by having 3 cuts with a knife blade by using it parallel to 3 axes.
2. This cut (split) of soap cake (cube) into 8 parts (8 sub cubes) is there as a split of 3-space into 8 octants format
3. One shall chase this split of cube into eight sub cube, parallel to it the split of 3-space into 8 octants, in three sequential steps:-

FIRST STEP:- knife blade shall be put along X-axis of the top surface of the cube and same shall be taken along the vertical axis till its reach uptill the X-axis of the bottom surface of the cube it shall be a cutting the cube the soap cake into two block.

SECOND STEP:- Now the knife blade put along the Y-axis of the top surface of the cube (as a set up of both blocks reached at during first step).

The knife blade shall be taken through both the block uptill Y-axis of the bottom surface.

It shall be resulting into split of both blocks of first stage cut, into two sub-blocks of each block.

There by there would be a reach at quadruple sub blocks.

THIRD STEP:- Now the knife edge be put along the third axes Z axes, of the 3 dimensional frames and there shall be cut up-till the reach at the Z-axis along the opposite surface.

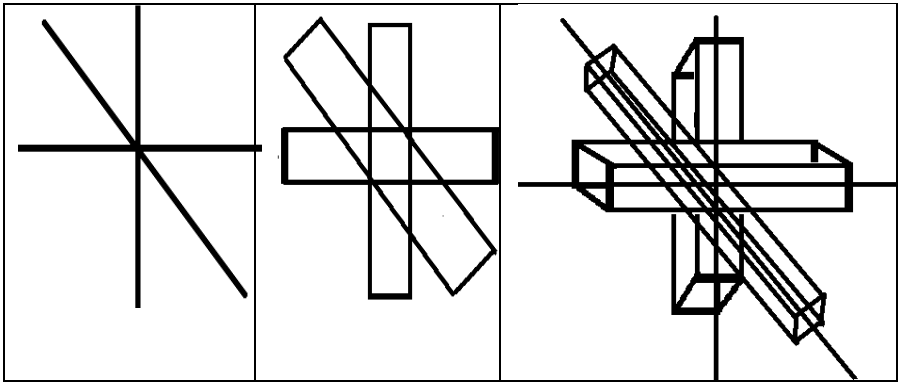
As a result each of the quadruple sub-block shall be splitting into a pair of parts and thereby would be a reach at eight parts of soap cake (8 sub cubes of cube).

4. This reach at the split of cube into 8 sub cubes shall be bringing us face to face with the reach at the split of 3-space itself into eight octants.
5. One shall sit comfortably and to glimpse and imbibe this happening of parallel split of cube into 8 sub cubes, on the one hand, and of 3-space into eight octants, on the other hand.
6. One shall further sit comfortably and to glimpse and imbibe as to how the knife blade which is of spatial (surface) set up, is playing its role parallel to the linear set ups of axes of the 3 dimensional frames.
7. It would be very blissful to construct parallel to linear axis of 3 dimensional frames, the set up of a 3 dimensional frames of 3 spatial (surface/ planes) axes.



LESSON 4

THREE DIMENSIONAL FRAME



1. 3 dimensional frames may be define and accepted as a set up of 3 distinct linear axes, which are not complainer but are meeting at common in between point of the axes.
2. The non coplanar feature of 3 axes means that all the 3 of them cannot be of complete placement with a single plane.
3. The in between common meeting point of axis means that each axis extends along both sides of the meeting points.
4. The said meeting point of the axis is designated as origin of the 3 dimensional frames.
5. With it, 3 dimensional frames becomes a set up of 3 linear axis and 4th origin.
6. The origin split each axes into two parts;
7. With it, triple axes lead to a set of six parts, individually designated as half dimensions (half axis).

8. In the light of the above, 3 half dimensions of 3 axes, together with the origin shall be constituting a 3 dimensional frame of half dimensions.
9. One may have a pause here and take note that, a 3 dimensional frame of full dimension leads to a pair of 3 dimensional frames of half dimensions.
10. One may further have a pause here and take note that both 3 dimensional frames of half dimensions shall be having a common origin.
11. It would be a blissful exercise to glimpse and imbibe the existence of a 3 dimensional frame of half dimensions.
12. Let us revisit the set up of the cube and we shall be finding that each corner points of the cube is embedded a 3 dimensional frame of half dimensions.
13. It is this feature and the existence phenomenon of a 3 dimensional frames of half dimensions, which deserves to be comprehended well.
14. It would be a blissful exercise to revisit the set up of a 3 dimensional frame of full dimensions as a synthesis set up of a pair of a 3 dimensional frames of half dimensions being of opposite orientation.
15. It is this feature of the set up of a 3 dimensional frame, which deserves to be comprehended well, particularly in reference to the orientations of a pair of half dimensions of a dimension.
16. It would be a blissful exercise to revisit the set up of a 2 dimensional frame as a synthesis set up of a pair of 2 dimensional frames of half dimensions of opposite orientations.
17. A step ahead, one shall visit the set up of a one dimensional frame as a synthesis set up of a pair of one

dimensional frame of half dimensions of opposite orientations. ■