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Visualizing Solid Shapes

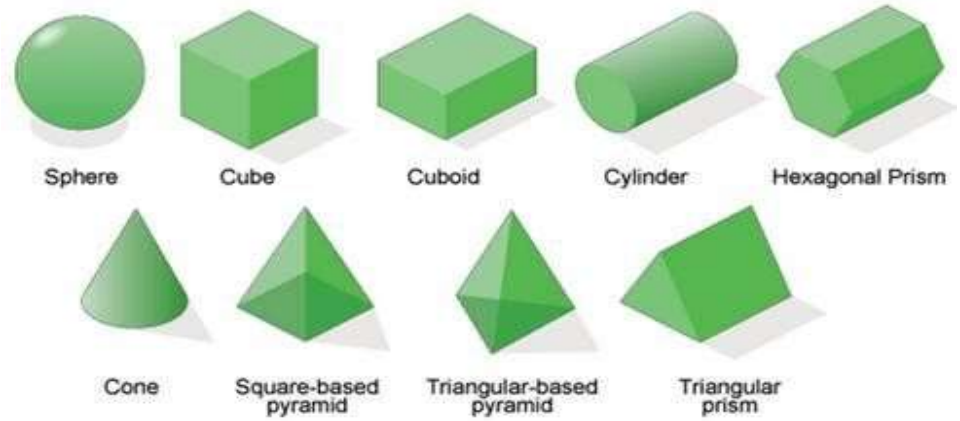
1. Plane Shapes:

- Plane shapes have two measurements like length and breadth.
- For example: Circle, Square, Triangle, Rectangle and Quadrilaterals are plane figures.
- Plane figure are of two – dimensions **(2 – D).**
  The cube, the cuboid, the sphere, the cylinder, the cone, the pyramid are examples of solid shapes.

2. Solid Shapes:

- Solid shapes have three measurements like length, breadth and height or depth.
- For example: Cube, Cuboid, Cone, Cylinder, Sphere, Pyramid are Solid figures.
- Solid figures are of three – dimensions **(3 – D).**

3. 3D Shapes:



- Each side of a solid has a surface called **a face.**
- Two faces meet at a line segment called **an edge.**
- Three edges meet at a point called **a vertex**.
- 3D shapes have **different views** when seen from **different positions**.

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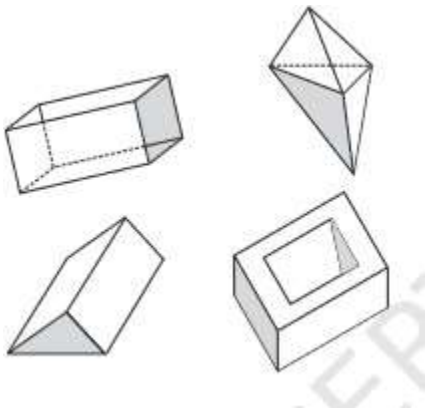
4. Mapping Space around us:

- A map is different from a picture.
- It depicts the location of a particular object/place in relation to other objects/places.
- Symbols are used to depict the different objects/places.
- Perspective is very important for a picture but it is not relevant for a map.
- Maps use a scale which is fixed for a particular map.
- It reduces the real distances proportionately to distances on the paper.

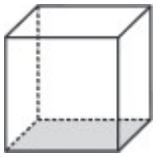
5. Polyhedron:

Polyhedron is a solid figure bounded by plane polygonal faces.



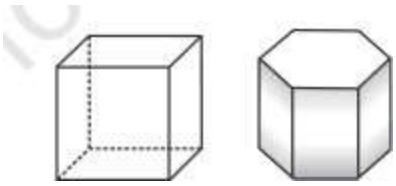
i. Regular polyhedrons:

A polyhedron is said to be regular if its faces are made up of regular polygons and the same number of faces meet at each vertex.



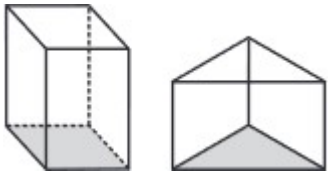
ii. Convex polyhedrons:

Convex Polyhedron is a polyhedron in which a line segment connecting any two vertices of the polyhedron contains only points that are on a face or inside the polyhedron.



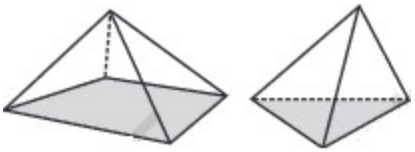
6. Important polyhedrons:

i. Prism:



- Prism is a polyhedron with two parallel opposite faces, called bases, that are congruent polygons and the lateral faces are parallelograms.
- A prism is called a triangular prism if its ends are triangles.

ii. Pyramid:



- Pyramid is a solid whose base is a plane rectilinear figure and whose side faces are triangles having a common vertex, called the vertex of the pyramid.
- A pyramid is said to be a regular pyramid if all the sides of its base are equal.
- A pyramid is called a triangular pyramid if its base is a triangle.
- A triangular pyramid is also called a tetrahedron.
- If the base of a pyramid is a quadrilateral, then it is called quadrilateral pyramid.

7. Euler's formula:

For any polyhedron: **F + V = E + 2**

where,

F = number of faces,
V = number of vertices,
E = number of edges.