**SHAPES AND SPATIAL UNDERSTANDING**
This unit can help young children build math skills by encouraging them to explore and compare shapes and spatial relationships.

SPATIAL RELATIONSHIPS
Spatial Relationships explore the concept of where objects are in relationship to something else. Some spatial concepts are:
  (i) Above, below
 (ii) Before, after
(iii) High, low
 (iv) Small, big
  (v) Outside, inside
 (vi) On top of, under
(vii) Near, far
(viii) In front of, in back of, behind

(a)   (b)   (c)   (d)
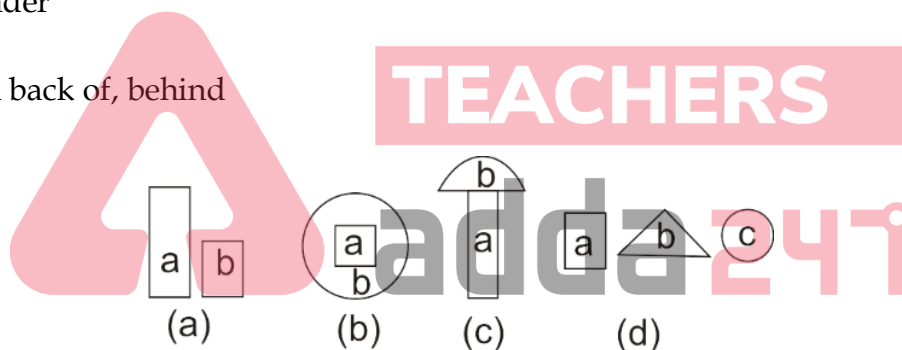
If we see above group (a), (b), (c) and (d) carefully, then we get the following results:
(a) a is bigger than b.
(b) a is inside and b is outside
(c) b is above and a is below.
(d) b is between a and c and a is far from c and is near to be.

OPEN AND CLOSED CURVES
A curve with end points or the ends didn't join up is called open curve.
A curve that joins up so there are no end point is called closed curve.
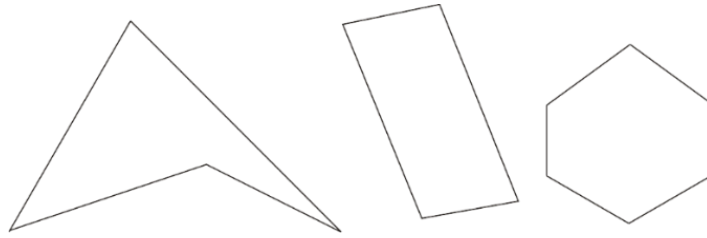

Open Curves   Closed Curves

Polygon: A closed plane figure made up of several line segments that are joined together. The sides do not cross each other. Exactly two sides meet at every vertex.

Some Polygons are-

Polygon Parts:

- **Side-** one of the line segments that's make up the polygon.
- **Vertex-** point where two sides meet. Two or more of these.
- **Diagonal-** a line connecting two vertices that is not a side.
- **Interior angle-** Angle formed by two adjacent sides inside the polygon.
- **Exterior Angle-** Angled formed by two adjacent sides outside the polygon.
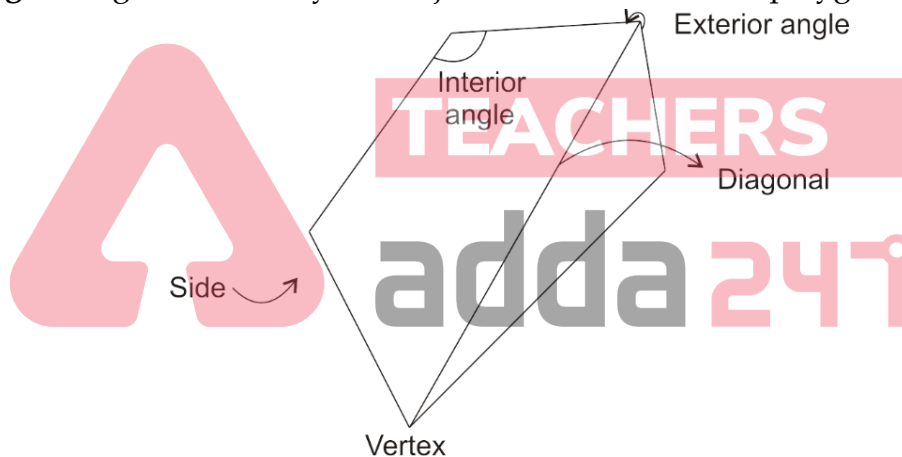
Example: Which one of the following figure is an open curve?

(A)

(B)

(C)

(D)
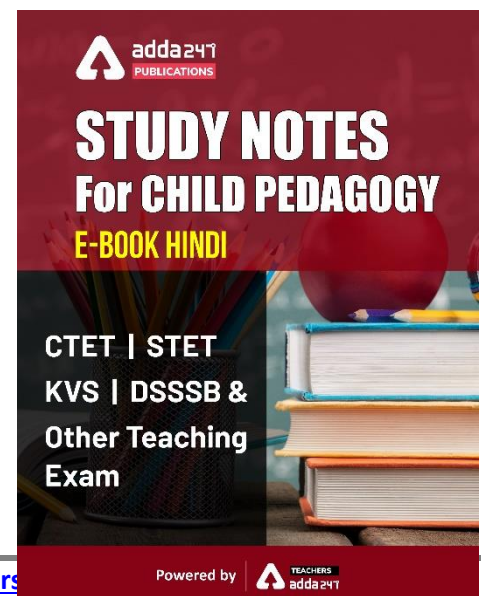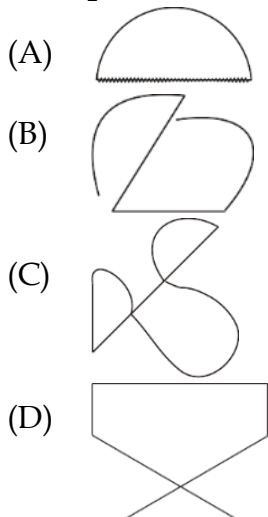
SOLID AROUND US

We live in a three-dimensional world. Every object you can see or touch has three dimensions that can be measured: length, width, and height.

Rectangular Room: The room you are sitting in can be described by these three dimensions such as L, B and H.

Dice: In a game of ludo, dice is in shape of cube.

Soccer ball: A soccer ball is a shape of sphere.

Conical Cape: A magician person or birthday cap are of conical shape.

Example: If Ram have three marbles of radius. If all marbles are same in colour and size, then total volume will be
(a) $4\pi r^3$ cubic unit
(b) $4/3 \, \pi r^3$ cubic unit
(c) $3\pi r^2$ cubic unit
(d) ¾ $\pi r^3 d$ cubic unit

Solution: Total volume $= 3 \times \frac{4}{3}\pi r^3 = 4\pi r^3 =$ cubic unit