

# DELHI MODERN PUBLIC SCHOOL PAMPORE

Subject: Mathematics

Term Ist: Study Material

Class: 6th

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## Chapter No: 5

### Topic: Understanding elementary shapes

#### Day 1: Introduction

Understanding elementary shapes deals with development of tools to measure shapes and their sizes. All the shapes around us are formed using curves or lines. They can be organized into line segments, angles, triangles, polygons and circles. They have different sizes and measures.

**Comparing line segments:** We can compare two line segments when we need to find which one is longer or shorter. We use different methods to compare line segment:

(i) Comparing using a tracing paper.

(ii) Comparing using a divider.

(iii) Comparing by observation.

**Collinear points:** Three or more points are said to be collinear if they lie on a single straight line.

**Note:** Write these key points on your notebook.

#### Innings 5.1

Q.No.1: Do yourself (measure length, breadth and height of your math's book, window of your house and your geometry box).

Q.No.2: (a) Shortest side =  $AB = 2\text{cm}$

Longest side =  $AC = 3.4\text{cm}$

(b) Do yourself.

Q.No.3:



Yes, the points D, E and F are collinear and point D lies between E and F.

Q.No.4: (a)  $PQ = 3.1\text{cm}$ ,  $QR = 2.5\text{cm}$ ,  $PR = 3\text{cm}$

$$PQ + QR = (3.1 + 2.5)\text{cm} = 5.6\text{cm} > PR$$

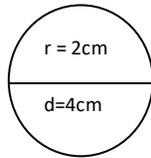
$$PQ + PR = (3.1 + 3)\text{cm} = 6.1\text{cm} > QR$$

$$QR+PR = (2.5+3) \text{ cm} = 5.5\text{cm} > PQ$$

Hence, in  $\Delta PQR$ , sum of any two sides is greater than the third side.

(b) Do yourself.

Q.No.5:



Hence the diameter is double the radius.

### Day2:

**Angle:** An angle is a figure formed by two rays, called the sides of the angle, sharing a common end

Point called the vertex of the angle.

Angle of  $0^\circ$  = zero angle

Angle of  $90^\circ$  = Right angle

Angle of  $180^\circ$  = Straight angle

Angle of  $360^\circ$  = Complete angle

Angle between  $0^\circ$  and  $90^\circ$  = Acute angle

Angle between  $90^\circ$  and  $180^\circ$  = Obtuse angle

Angle between  $180^\circ$  and  $360^\circ$  = Reflex angle

**Note:** Write these key points on your notebook.

### Innings 5.2

Q.No.1:  $\angle ABC < \angle XYZ < \angle MNP < \angle PQR < \angle GEF < \angle TUV < \angle RST < \angle UVW < \angle WXY$

Q.No.2: (a)  $\angle ABC = 30^\circ$ , which is acute                      (b)  $\angle PQR = 100^\circ$ , which is obtuse

(c)  $\angle TSR = 200^\circ$ , which is reflex

Do other parts by yourself.

Q.No.3:  $\angle a = 90^\circ$ , right angle                       $\angle b = 20^\circ$ , acute angle                       $\angle c = 70^\circ$ , acute angle

Therefore,  $\angle a + \angle b + \angle c = 90^\circ + 20^\circ + 70^\circ = 180^\circ$ .

Hence verified.

Q.No.4: Do yourself.

**Day3:**

Q.No.5:  $\angle EFB$  is obtuse angle.

$\angle EFA$  is acute angle.

$\angle EFD$  is obtuse angle

$\angle CFA$  is reflex angle

$\angle CFE$  is straight angle

Q.No.6: (a) (i) the hour hand of a clock turn through one quarter ( $\frac{1}{4}$ ) fraction of clockwise revolution when it goes from 2 to 5.

Do other parts by yourself.

(b): (i) The hour hand will stop at 4

(ii) The hour hand will stop at 3

(iii) The hour hand will stop at 11

(c): (i) No. of right angles = 3

(ii) No. of right angles = 2

(iii) No. of right angles = 1

Q.No.7: (a) South direction      (b) West direction      (c) East direction

**Day 4:**

**Triangle:** A triangle is the simplest polygon, having three sides, three vertices and three angles.

**Types of triangle on the basis of sides.**

**(i)Equilateral triangle:** All the sides are of equal length; each angle is of  $60^\circ$ .

**(ii)Isosceles triangle:** Two sides are of equal length; angles opposite to equal sides are equal.

**(iii) Scalene triangle:** All the sides and angles are of different measure.

**Types of triangle on the basis of angles.**

**(i)Acute angled triangle:** All the angles are acute.

**(ii)Right angled triangle:** One angle is right angle.

**(iii)Obtuse angled triangle:** One angle is obtuse

**Note:** Write these key points on your notebook.

### **Innings 5.3**

Q.No.1: (a) A triangle is called acute if all of its angles are acute.

(b) A scalene triangle can be a right angled triangle.

(c) A triangle whose one angle is obtuse is called an obtuse angled triangle.

Do other parts by yourself.

Q.No.2: In fig.5.19, there are 11 triangles.

(a)  $\triangle ABC$

(b)  $\triangle FJG$

(c)  $\triangle CLN$

Q.No.3: The smallest regular polygon is an equilateral triangle. The measure of each of its interior angle is  $60^\circ$ .

Q.No.4: Yes, an isosceles triangle can be right angled.

Q.No.5: (a) acute isosceles triangle

(b) Right isosceles triangle

(c) Right scalene triangle

(d) acute equilateral triangle

(e) Obtuse scalene triangle

Q.No.6: In a right angled triangle, the other two angles have a sum =  $90^\circ$  (sum of three angles of a  $\triangle = 180^\circ$ )

### **Day 5:**

**Quadrilaterals:** A quadrilateral is a two dimensional shape made of four sides and four vertices. Squares and rectangles are special types of quadrilaterals.

**Note:** Write the special types of quadrilaterals given on page no.88 and 89 on your notebooks.

**Regular polygon:** A polygon in which all the sides are of equal length.

**Irregular polygon:** A polygon whose sides are not of equal length.

**Note:** Write these key points on your notebook.

### **Innings 5.4**

Q.No.1: (a) Rhombus

(b) Rectangle

(c) Parallelogram

(d) Square

Q.No.2: A polygon with six equal sides is a regular hexagon.

Q.No.3: No, it is not a square because the lengths of diagonals of a square are equal.

Q.No.6: (a) 7

(b) Octagon

(c) Regular

Q.No.4 and 5: Do yourself.

**Day 6:**

**Three dimensional shapes:** The solid that do not lie in one plane and have three dimensions (length, breadth and height) are called three dimensional (3D) shapes.

**Some common 3D shapes:**

**Cuboid:** A 3D shape having six rectangular faces e.g. a geometry box.

**Cube:** A cuboid whose length, breadth and height are equal.e.g. a die.

**Cone:** A 3D shape bounded by one curved and one plane face.e.g.an ice-cream cone.

**Sphere:** A 3D shape bounded by one curved face. It has no vertices and no edges.e.g. a ball.

**Pyramid:** A 3D shape that has only one base and all the lateral faces are triangles.

**Note:** Write these key points on your notebook.

**Day 7:**

**Innings 5.5**

Q.No.1: Do yourself (identify 3D shapes from your surroundings and classify them)

Q.No.2: Tetrahedron.

Q.No.3: A pentagonal pyramid has six faces, six vertices and ten edges.

A triangular prism has five faces, six vertices and nine edges.

Q.No.4: Cuboid.

Q.No.5: (a) False, In a pyramid all the lateral faces are triangles.

(b) True.

Do other parts by yourself.

Q.No.6: (a) Triangular prism

(b) Cylinder

No. of faces = 5

No. of faces = 6

No. of vertices = 6

No. of vertices = 0

No. of edges = 9

No. of edges = 2