Lab Manual
in Mathematics

Class VIII

PSEB

- Syllabus
- Activities
- Exam pattern

English Version

Scheme of Evaluation

Time : 2 hours   **Year-end Evaluation of activities : 10 marks**

The break up of 10 marks could be as under :
(i)   Evaluation of two activities out of four   :   4×2=8 marks
(ii)   Viva   :   2 marks

Important :

The year-end assessment of practical skills will be done during an organized session in small groups as per t he convenience of the schools. All the activities   given in the document, every   student may be asked to complete these activities during the academic year. He/she should be asked to maintain a proper activity record for this work done during the year. The activities should be preferably carried out individually and not in a group as it helps the each student to build interest and confidence in learning the subject.

With Best Wishes

Bhinder Singh Math Master
GHS Malkana (Bathinda)
Mob: 88729-12537
Email : bs.bhinder0001@gmail.com

LIST OF HANDS-ON ACTIVITIES IN MATHEMATICS

1. To verify that the sum of interior angles of a quadrilateral is 360^0 by an activity.

2. To verify that the sum of measures of the exterior angles of any polygon is 360^0 by paper cutting and pasting.

3. To make the following by paper folding and cutting
   - a. a kite
   - b. a rhombus

4. To verify that
   - diagonals of a rectangle are of equal length
   - diagonals of a square are of equal length
   - diagonals of a rhombus and a parallelogram are not of equal length

5. To observe the following number patterns and generate it up to next three steps

   i)
   $$1^2 = 1$$
   $$11^2 = 121$$
   $$111^2 = 12321$$

   ii)
   $$1+3 = 4 = 2^2$$
   $$1+3+5 = 9 = 3^2$$
   $$1+3+5+7 = 16 = 4^2$$

   (Note: Teacher may take any other such number patterns)

6. To verify that algebraic identity $(a + b)^2 = a^2 + b^2 + 2ab$ by paper cutting and pasting

7. Draw front view, top view and side view of the shapes made by unit cubes on isometric dot sheet.

8. To obtain the formula for total surface area of cuboid.

9. To make cuboids and cubes of given dimensions (4x3x2 , 3x3x3) using unit cubes and to calculate volume of each.

10. To obtain the formula for total surface area of cylinder.

ACTIVITY-1

To verify that the sum of interior angles of a quadrilateral is 360^0 by an activity.

Pre-requisite : **Knowledge of a quadrilateral and its interior angles. Idea of a complete angle .**

Materials Required : **A coloured sheet of a paper, a plain sheet of a paper,glue, a pair of scissors, a ruler and a pencil/pen.**

Procedure : **Draw a quadrilateral ABCD on a plain sheet of a paper and cut angles A, B,C and D with help of scissor and paste these angles around a point O as shown in picture below**
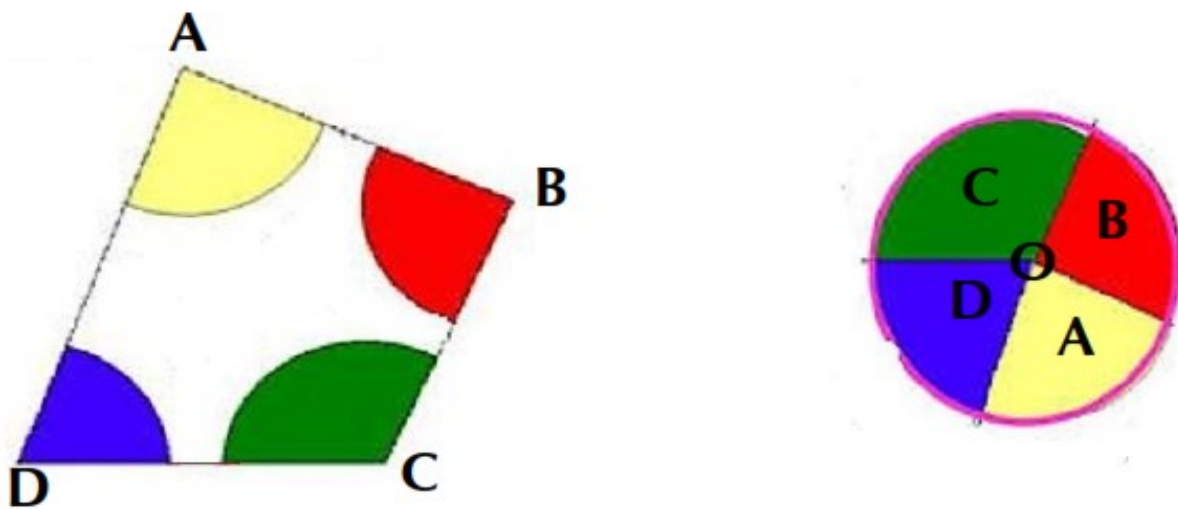
Observations :

♦   **All angles together forms a complete angle .**
♦   **The sum of four angles of a quadrilateral is 360^0.**

Learning Outcome : **We learn that the sum of interior angles of a quadrilateral is 360^0**

ACTIVITY-2

To verify that the sum of measures of the exteriorangles of any polygon is 360^0 by paper cutting and pasting.

Pre-requisite : **Knowledge of exterior angles of a polygon and a complete angle .**

Materials Required : **A coloured sheet of a paper, a plain sheet of a paper,glue, a pair of scissors, a ruler and a pencil/pen.**

Materials Required : **A coloured sheet of a paper, a plain sheet of a paper,glue, a pair of scissors, a ruler and a pencil/pen**.

Procedure : (a) For triangle :
Step 1. Draw a triangle ABC on a coloured sheet . Make exterior angles P,Q and R in an order at each vertex of this triangle as shown in figure (i) .

Step 2. Cut out all the three exterior angles. Paste them at a point O so that there is no gap between them as shown in figure (ii).
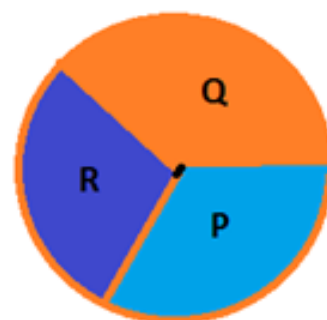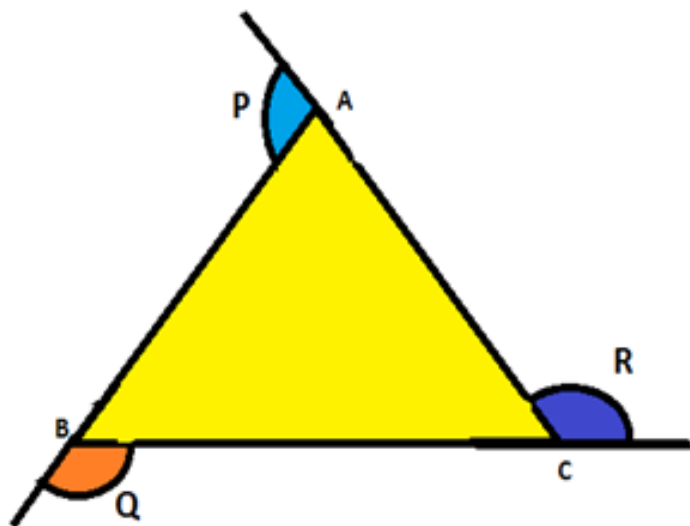

(b) For quadrilateral : **Draw a quadrilateral on a coloured sheet of paper . Mark their exterior angles taken in order at each vertex as shown in figure (iii).**

Repeat Step 2 as for triangle.

For more activities like these visit on : www.successsadda .in
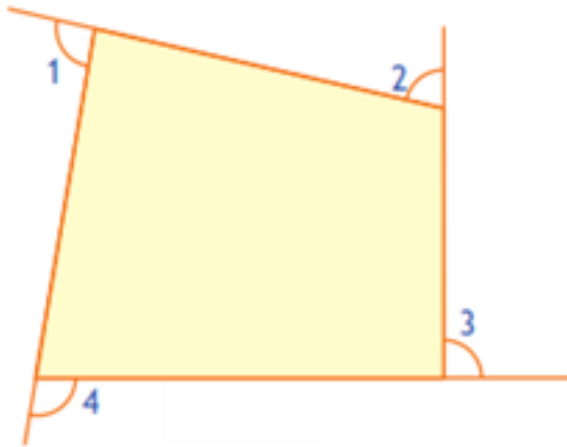
(c) For other polygons : Draw a pentagon and a hexagon on a coloured sheet of paper. Mark their exterior angles taken in order at each vertex.

Repeat Step 2 for each of these polygons .
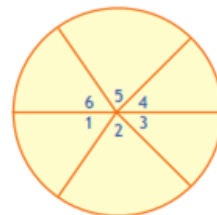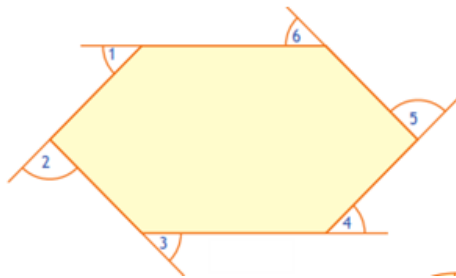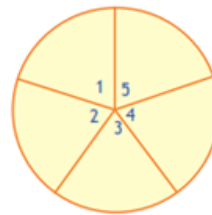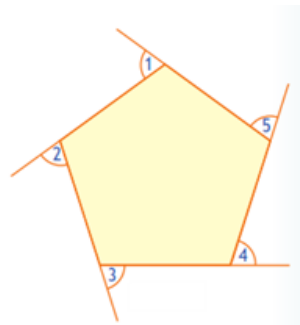
Observations :

The sum of exterior angles of a triangle taken in an order is …………
The sum of exterior angles of a quadrilateral taken in an order is ……
The sum of exterior angles of a pentagon taken in an order is …………
The sum of exterior angles of a hexagon taken in an order is ....
The sum of exterior angles in each polygon taken in an order is ……

Learning Outcomes : We learn that the sum of exterior angles of polygon is 360^0

ACTIVITY-3

To make the following shapes by paper folding and cutting.
(a) A kite   (b) A rhombus

Pre-requisite : Familiarity with a quadrilateral and its parts.

Materials Required : Sheets of paper, a pair of scissors, a ruler and a pencil/pen.

Procedure : Take a rectangular sheet of paper as shown in fig. (a) and follow steps as shown in figures below, then we will get required kite & rhombus :

4(a)

4(b)

4(c)

4(d)

4(e)

4(f)

4(h)
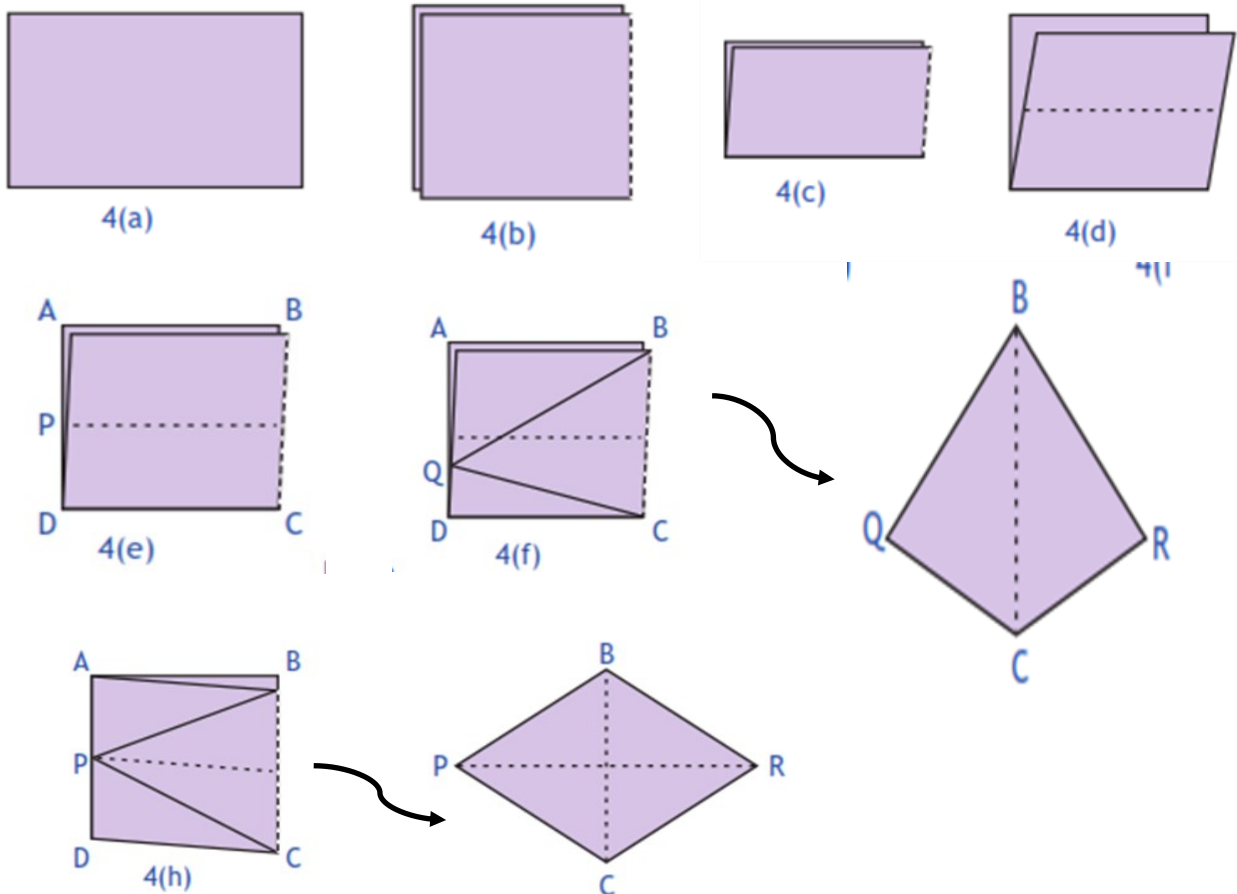
Observations :

- **Are all the sides of the kite obtained in Fig. equal? ....(Yes / No)**

- **Are pairs of opposite sides equal? .... (Yes / No)**

- **Which pairs of adjacent sides are equal? ....**

- **Are all the sides of the rhombus equal? .... (Yes / No)**

- **How a kite is different from a rhombus? ....**

Learning Outcomes : **We have understand the shape of a kite and that of a rhombus.**

ACTIVITY-4

To verify that
    (i)   diagonals of a rectangle are of equal length
    (ii)   diagonals of a square are of equal length
    (iii) diagonals of a rhombus and a parallelogram are not of
        equal length

**Pre-requisite :** Knowledge of diagonals of a quadrilateral.

Materials Required : A thick piece of thread, a sheet of paper, a ruler, a pencil, and a sketch pen.

Procedure :

    (i) Draw a rectangle on a sheet of paper and name its vertices as A, B, C and D. Join diagonals AC and BD and take a thread, place it on point A. Stretch the thread along AC. Mark both the points A and C on the thread with a sketch pen. Now stretch the marked portion of the thread placing it along BD and check whether AC and BD are equal or not .

(a)   (b)   (c)
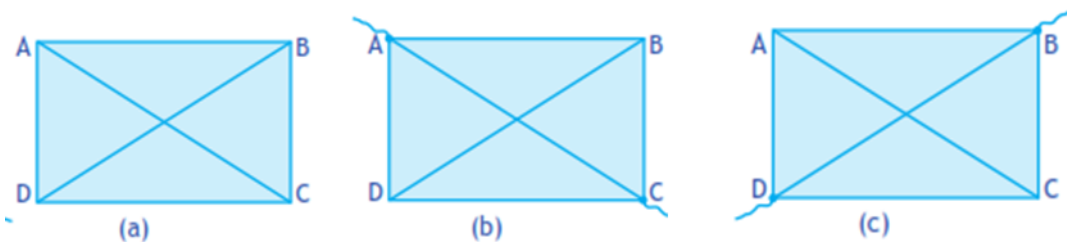
    (ii) Draw a square on a sheet of paper and repeat Steps as in part(i). Check whether AC and BD are equal or not.

(d)   (e)   (f)
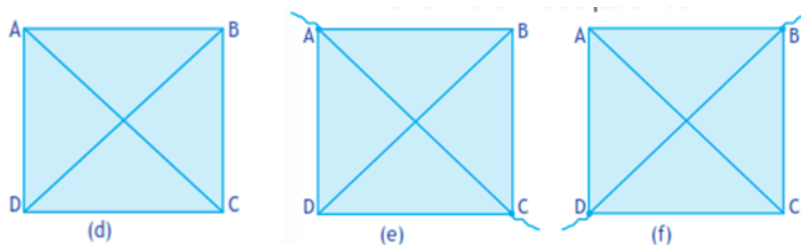
    (iiI) Draw a rhombus or a parallelogram. Check whether AC and BD are equal or not by thread as in part (i) and (ii)

(g1)   (g2)
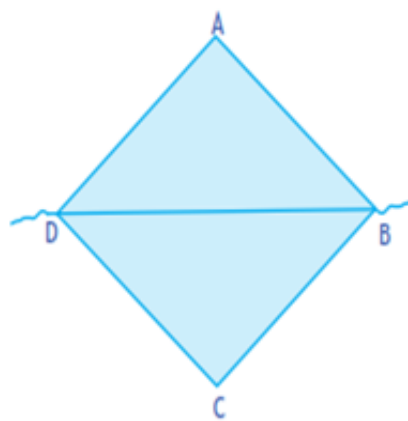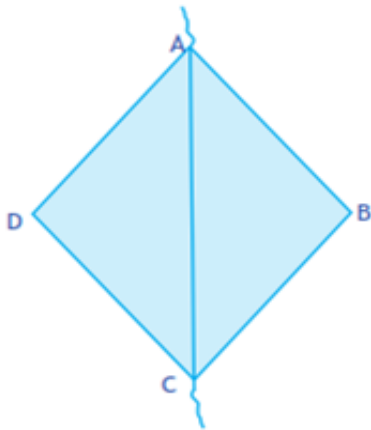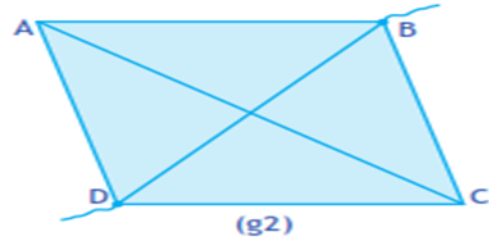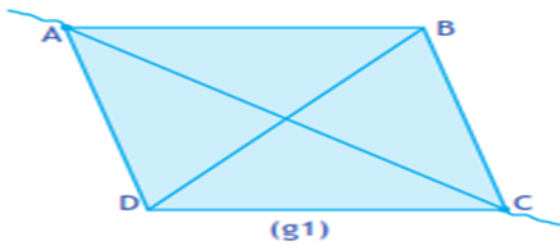
Observations :

Write the correct options –

Diagonals of a rectangle are .... (equal/unequal).

Diagonals of a square are ....(equal/unequal).

3. Diagonals of a parallelogram are ....(equal/unequal).

4. Diagonals of a rhombus are ....(equal/unequal).

Learning Outcomes : We learn that the properties of the diagonals of a square, a rectangle, a parallelogram and a rhombus.

ACTIVITY-5

To verify that algebraic identity $(a + b)^2 = a^2 + b^2 + 2ab$ by paper cutting and pasting.

Pre-requisite : Knowledge of number patterns .

Materials Required : Some patterns involving numbers.

Procedure :

Step 1. Observe carefully the following number patterns:

(a) $1^2 = 1$

$11^2 = 121$

$111^2 = 12321$

(b) $1 + 3 = 4 = 2^2$

$1 + 3 + 5 = 9 = 3^2$

$1 + 3 + 5 + 7 = 16 = 4^2$

Step 2. Identify the rule involved in each pattern.

Step 3. Complete next three rows of each pattern on the basis of the identified rule in Step 2.

Observations :

I.   4th row in pattern (a) is : $1111^2 = 1234321$

5th row is : $11111^2 =$.........................

6th row is : .... = 123456 ....

II.   4th row in pattern (b) is : $1+3+5+7+9 = 25 = ($...............$)^2$

5th row is : $1+3+5+7+9+11=$......................... $= ($...............$)^2$

6th row is : $1+3+5+7+$.............$= 49 = ($...............$)^2$

Learning Outcomes : We learnt that number patterns and to generalise them.

Activities of other classes are also available

Activities of class 6th

Activities of class 7th

Activities of class 8th

Activities of class 9th

Activities of class 10th

Visit on my website click :   www.successadda.in