

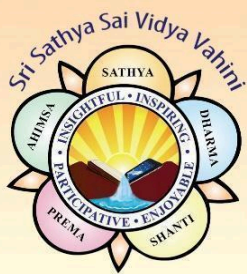
|| Aum Sri Sai Ram ||

*Sri Sathya Sai*  
**VIDYA VAHINI**  
श्री सत्यसाई विद्या वाहिनी



|                  |                           |
|------------------|---------------------------|
| <b>TOPIC</b>     | Perimeter and Area        |
| <b>SUB-TOPIC</b> | Area of the Parallelogram |
| <b>DURATION</b>  | 35 minutes                |

|                                             |                                                                                                                    |                                                                                                                                                           |
|---------------------------------------------|--------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CURRICULAR GOALS</b>                     | CG-4<br>Develops understanding of perimeter and area for 2D shapes and uses them to solve day-to-day life problems |                                                                                                                                                           |
| <b>COMPETENCIES AS PER NCF/NIPUN BHARAT</b> | Remember                                                                                                           |                                                                                                                                                           |
|                                             | Understand                                                                                                         |                                                                                                                                                           |
|                                             | Apply                                                                                                              |                                                                                                                                                           |
|                                             | Analyse                                                                                                            |                                                                                                                                                           |
|                                             | Evaluate                                                                                                           | C-4.1 Discovers, understands, and uses formulae to determine the area of a parallelogram and develops strategies to find the areas of composite 2D shapes |
|                                             | Create                                                                                                             |                                                                                                                                                           |

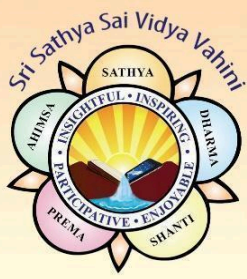


|                                           |                                                                                                              |
|-------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| <b>Strategies As Per NEP</b>              | Experiential Learning                                                                                        |
| <b>Learner Centric Techniques used</b>    | Think-Pair-Share                                                                                             |
| <b>Teacher's Tool Kit</b>                 | Entry Ticket                                                                                                 |
| <b>SDG(Sustainable Development Goals)</b> | SDG 4 : Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all |
| <b>Inter/Multidisciplinary elements</b>   | Yes                                                                                                          |

|                                          |                                                                             |
|------------------------------------------|-----------------------------------------------------------------------------|
| <b>Technology aids</b>                   | NA                                                                          |
| <b>Teaching Learning Materials (TLM)</b> | NA                                                                          |
| <b>Learning Aids</b>                     | EM_LA_Area of the Parallelogram_Worksheet                                   |
| <b>Assessment (As, For, Of)</b>          | Assessment for learning(AFL)<br>Assessment of learning(AOL) - QA(Worksheet) |
| <b>References</b>                        | NA                                                                          |

|                                    |                       |
|------------------------------------|-----------------------|
| <b>Previous Knowledge required</b> | Area of the rectangle |
|------------------------------------|-----------------------|

**Brief Description :** This module presents an **Experiential Learning strategy** for the concept of *Area of the Parallelogram*. The experiential learning activity involves creation of a mini playground in the form of a parallelogram using clay and graph sheets.

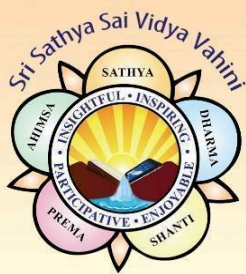


# Sri Sathya Sai VIDYA VAHINI

श्री सत्यसाई विद्या वाहिनी



A follow up graph sheet activity is provided to enhance the understanding of the real life application of the concept.



## 1. SA\_Area of the Parallelogram

**Specific Learning Outcome:** Students will be able to establish the formula for the area of a parallelogram through a hands-on clay modelling project.

**Duration :** 35 minutes

**Aim:** To understand how to find the area of a parallelogram through a hands-on clay modelling project.

### **Resources Required:**

- Clay or playdough / Thermocol sheet
- Rulers
- Measuring tape
- Plastic knives or clay cutting tools
- Flat surface or mat for modelling
- Graph sheet
- A4 sheets for recording observations

**Setting for the Activity:** Indoor

**Type of Activity:** Experiment by students

**Preparation of Activity:** One day prior to the activity, divide the class into teams of 5 or 6 students. Ask the student teams to bring clay with the colour of their choice, plastic cutting-knife, measuring-tape and flat mat. Explain the activity to the students and assign the task of creating a mini playground that is shaped like a parallelogram.

**[Note to the teacher:** Ensure that there is least change in the seating arrangement in the classroom for conducting the activity, so as to save time].

**Role of the Teacher:** Facilitator

### **Procedure:**

**(Entry Ticket)** Begin with a brief discussion on different shapes we encounter daily, focussing on parallelograms. Pose a question: "How can we find the area of a playground that is shaped like a parallelogram?"

### **Step1: Concrete Experience:**

- Explain that students will create a mini playground layout in the shape of a parallelogram using clay.
- Distribute clay, rulers, and cutting tools to the students.
- Ask students to mould the clay into a flat parallelogram with specified base and height, on their work surface. In order to aid them in forming a parallelogram, graph sheets can be used initially to



draw parallelograms and then the clay can be moulded onto the graph sheet above the parallelogram drawn on the sheet. Later on the clay mould in the form of parallelogram can be removed.

- Have students measure the base and height of their clay parallelogram using rulers and measuring-tape.
- Once the clay parallelogram is modelled, explain that students will transform their parallelogram into a rectangle to understand the area calculation.
- Ask students to cut the parallelogram along the height from one vertex perpendicular to the opposite side to create a triangle using plastic knives.
- Move the triangle to the opposite side of the parallelogram to form a rectangle.



Image Source: OC (PPT Shapes)

- Discuss how this transformation helps in understanding why the area formula works.

## Step2: Reflective Observation:

Guide students to observe the new shape (rectangle) and ask:

- "Is the area of the parallelogram equal to the area of the rectangle?"
- "What are the dimensions of the rectangle in terms of the parallelogram's base and height?"
- Ask students what they found interesting and intriguing.
- Discuss the challenges they faced during the process of converting the parallelogram to a rectangle.

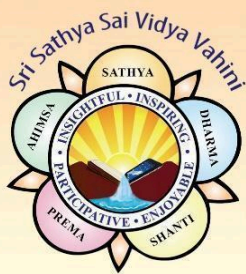
## Step3: Abstract Conceptualisation:

### Explaining the Formula:

Explain that transforming the parallelogram into a rectangle helps us see why the area formula works. The base of the parallelogram becomes the length of the rectangle, and its height is the breadth of the rectangle.

Thus the area of the parallelogram is found using the formula:

Area = base  $\times$  height



Write the formula on the board.

#### **Calculating Area:**

Provide different parallelogram cut-outs with specified base and height.

Ask students to calculate the area using the formula.

Allow students to verify the formula by measuring approximate values of base, height and the area of their clay models(approximate area can be measured by counting the number of unit squares in the corresponding parallelogram on the graph sheet).

#### **Step4: Active Experimentation:**

#### **Real-Life Application:**

Present a question: One side of the roof of a house is a parallelogram. To cover the area of the roof, 300 rectangular tiles of dimensions 30cm x 15 cm are used. If the length of one side of the roof is 4.5 m, find the corresponding height.

Allow students to solve this using the area formula.

For a real-life touch, discuss

- How roofers or construction workers use similar calculations to determine the amount of materials needed for roofing projects.
- Ask students to imagine they are planning the roofing of a new house and need to order the correct number of tiles. Ask them how they would calculate the area, convert units and determine the number of tiles required.

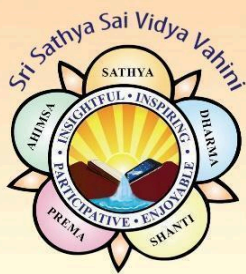
#### **Conclusion:**

Summarise the key points: definition of base and height, transforming a parallelogram into a rectangle, and calculating the area using the formula.

#### **Interactive Q&A:(Think – Pair – Share)**

Engage students with a few quick questions to reinforce their understanding and pair up the students to make them think, analyse and answer these questions.

- 1) If a parallelogram has a base of 5 cm and a height of 3 cm, what is its area?
- 2) Draw another parallelogram on a graph sheet with a different base and height. Calculate its area.



- 3) Given a parallelogram with a base of 18 cm and height of 8 cm, calculate the area and draw another parallelogram on a graph sheet with the same area but a different base and height.

### Followup activity

#### 1. Graph Sheet Activity:

- Explain the conversion of units (e.g. 100 cm in 1 m) and how to adjust measurements for drawing on graph paper.
- Provide an example: If the base of a parallelogram is 2 metres and the height is 1.5 metres, convert these to centimetres for drawing on the graph paper. (2 metres = 200 cm, 1.5 metres = 150 cm)
- Distribute graph sheets and specify measurements in metres that need to be converted into centimetres.
- Divide the students into groups and give them a different set of values of base and height and ask them to draw the parallelogram on the graph paper using the converted measurements.

Allow students to decorate, colour, and add designs to their parallelograms for display on the softboard in the corridor.

#### Understanding the Scale:

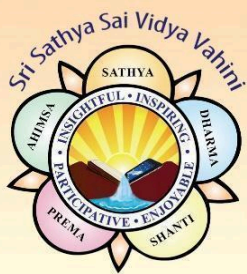
- Each square on the graph sheet represents 1 cm x 1 cm.

#### Scaling Down the Measurement:

- Since it's impractical to draw a 200 cm line directly on the graph sheet, students need to scale down the measurements to fit the graph.
- Decide on a suitable scale. For example, use a scale of 1:10 (meaning 1 cm on the graph sheet represents 10 cm in real life).

#### Applying the Scale:

- For a base of 200 cm:
  - Using the 1:10 scale, 200 cm in real life would be represented as  $200 \text{ cm} / 10 = 20 \text{ cm}$  in graph sheet.
- For a height of 150 cm:
  - Using the 1:10 scale, 150 cm in real life would be represented as  $150 \text{ cm} / 10 = 15 \text{ cm}$  on the graph sheet.



### 3)QA\_Area of the parallelogram

**Specific Learning Outcome:** Students will be able to apply the formula of area of a parallelogram and solve real life problems.

**[Note to the teacher:** The teacher will provide the worksheet “**EM\_LA\_Area of the Parallelogram\_Worksheet.pdf**” to the students as a take-home assignment to reinforce their understanding of the lesson. It can also be taken up in the next class period to assess the understanding.]

