

LESSON PLAN



DLF Public School
THE LEARNING ACADEMY
Managed By *Darbari Lal Foundation*

Class	Subject	Time slot	Lesson	Topic P3
IX	Mathematics	35 Mins 1 Pd	Areas of Parallelograms and Triangles	☐ Proof of Parallelograms on the same Base and Between the same Parallels are equal in area ☐ Ex 9.2

Expected Learning Outcome: Learners will be able to

- 1) Prove that the parallelograms having the same base and lying between the same parallels are equal in area
- 2) Apply the concept to solve the problems

Expected skill development:

- 1) Procedural thinking
- 2) Communicating using mathematical terminology relating to geometry
- 3) Representation skill while drawing the figure as per the requirement of the question
- 4) Developing connections between different properties of Parallelogram and Triangles

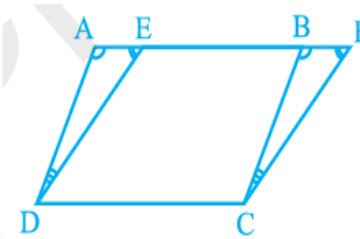
FLOW OF LESSON WITH RESPECT TO TIME (Introduction/ warm-up, Content, Think Line, Closure)

<u>Pedagogy</u>	<u>Content</u>
<u>(10 mins) Warm Up</u> <u>Demonstration By learners</u>	<u>Demonstration by learners</u> Theorem 9.1 : Parallelograms on the same base and between the same parallels are equal in area.

(20 mins) Demonstration by Facilitator on Board

Facilitator will explain the activity through the figure given below.

Theorem 9.1: *Parallelograms on the same base and between the same parallels are equal in area.*



Proof : Two parallelograms ABCD and EFCD, on the same base DC and between the same parallels AF and DC are given in above figure.

We need to prove that $\text{ar}(\text{ABCD}) = \text{ar}(\text{EFCD})$. In $\triangle ADE$ and $\triangle BCF$,

$\angle DAE = \angle CBF$ (Corresponding angles from $AD \parallel BC$ and transversal AF) (1)

$\angle AED = \angle BFC$ (Corresponding angles from $ED \parallel FC$ and transversal AF) (2)

Therefore,

$\angle ADE = \angle BCF$ (Angle sum property of a triangle) (3)

Also, $AD = BC$ (Opposite sides of the parallelogram ABCD) (4)

So, $\triangle ADE \cong \triangle BCF$ [By ASA rule, using (1), (3), and (4)]

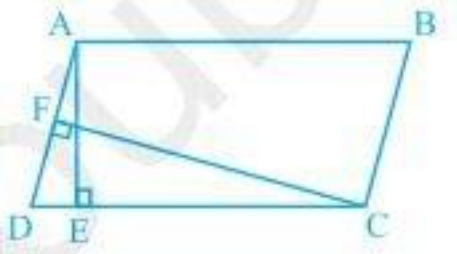
Therefore, $\text{ar}(\triangle ADE) = \text{ar}(\triangle BCF)$ (Congruent figures have equal areas) (5)

Now, $\text{ar}(\text{ABCD}) = \text{ar}(\triangle ADE) + \text{ar}(\text{EDCB})$

$= \text{ar}(\triangle BCF) + \text{ar}(\text{EDCB})$ [From (5)]

$= \text{ar}(\text{EFCD})$

So, parallelograms ABCD and EFCD are equal in area

<u>(5 mins) Inclass Exercise: Closure</u>	Q1. In Fig. 9.15, ABCD is a parallelogram, $AE \perp DC$ and $CF \perp AD$. If $AB = 16$ cm, $AE = 8$ cm and $CF = 10$ cm, find AD. 
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Proposed Questions (must include the questions asked in the classroom <u>and</u> the ones given as class-work in the notebook	
Evaluation/ Assessment: Notebook work, Observation, Black Board Assessment,	
Learners on the way In Fig. 9.15, ABCD is a parallelogram, $AE \perp DC$ and $CF \perp AD$. If $AB = 16$ cm, $AE = 8$ cm and $CF = 10$ cm, find AD. 	Advanced Learner Prove that parallelogram on the same base and equal in area lie between same parallels.
Materials needed/ Resources:- Chalk, Duster, NCERT Text Book	
Common Misconceptions:	Addressing the misconceptions:

☐ **Home Assignment:** Write the converse of the above statement and prove it