



basic education

Department:  
Basic Education  
REPUBLIC OF SOUTH AFRICA

## MATHEMATICS LESSON PLAN

### GRADE 9

TERM 2: April - June

PROVINCE:	
DISTRICT:	
SCHOOL:	
TEACHER'S NAME:	
DATE:	
DURATION:	1 Hour

**1. TOPIC: GEOMETRY OF 2D SHAPES: Solving problems (Lesson 10)**

**2. CONCEPTS & SKILLS TO BE ACHIEVED:**

**By the end of the lesson learners must know and be able to solve geometric problems involving unknown sides and angles in triangles and quadrilaterals, using known properties of triangles and quadrilaterals, as well as properties of congruent triangles.**

<b>3. RESOURCES:</b>	DBE workbook, Sasol-Inzalo Book 1, textbooks
<b>4. PRIOR KNOWLEDGE:</b>	<ul style="list-style-type: none"> <li>• minimum conditions for congruent triangles</li> <li>• properties of triangles</li> <li>• properties of straight lines</li> </ul>

**5. REVIEW AND CORRECTION OF HOMEWORK** (suggested time: 10 minutes)

Homework provides an opportunity for teachers to track learners' progress in the mastery of mathematics concepts and to identify the problematic areas which require immediate attention. Therefore, it is recommended that you place more focus on addressing errors from learner responses that may later become misconceptions.

**6. INTRODUCTION** (Suggested time: 10 Minutes)

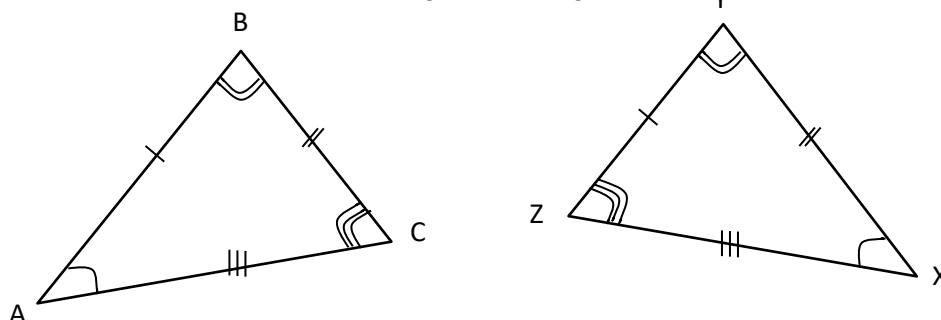
**Activity 1**

Ask learners to state the four conditions for congruent triangles

- SSS (all corresponding sides are equal)
- SAS (two corresponding sides and the angle between the two sides are equal)
- AAS (two corresponding angles and any corresponding side are equal)
- RHS (both triangles have a  $90^\circ$  angle and have equal hypotenuses and one other side equal).

**Activity 2**

Discuss the correct notation for congruent triangles with learners.



The order in which we write the letters when stating that two triangles are congruent is very important. The letters of the corresponding vertices between the two triangles must appear in the same position in the notation. For example, the notation for the triangles above should be:  $\triangle ABC \equiv \triangle XYZ$ , because it indicates that  $\hat{A} = \hat{X}$ ,  $\hat{B} = \hat{Y}$ ,  $\hat{C} = \hat{Z}$ ,  $AB = XY$ ,  $BC = YZ$  and  $AC = XZ$ .

It is incorrect to write  $\triangle ABC \equiv \triangle ZYX$ . Although the letters refer to the same triangles, this notation indicates that  $\hat{A} = \hat{Z}$ ,  $\hat{C} = \hat{X}$ ,  $AB = ZY$  and  $BC = YX$ , and these statements are not true.

Write down the equal angles and sides according to the following notations:

1.  $\triangle KLM \equiv \triangle PQR$
2.  $\triangle FGH \equiv \triangle CST$

**Note:**

Guard against the misconception that the use of the angles to notate the congruency might create the impression that equal angles in triangles are a condition for congruency.

## 7. LESSON PRESENTATION/DEVELOPMENT (Suggested time: 20 minutes)

### Teaching activities

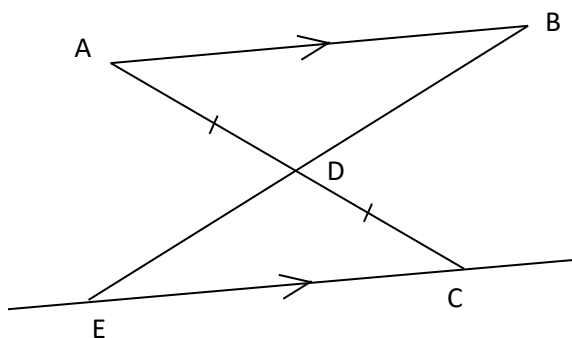
Work through the example with the learners showing them how to use the four conditions of congruency for triangles to prove that two triangles are congruent.

Give learners the following hints when proving two triangles congruent:

- Provide a reason for every statement.
- You must give three statements to prove any two triangles congruent.
- The order in which you write the letters when stating that two triangles are congruent is very important. The letters of the corresponding vertices between the two triangles must appear in the same position in the notation.

**Example:**

In the sketch:  $AB \parallel EC$  and  $AD = DC$ . Prove that the triangles are congruent.



### Learning activities (Learners are expected to:)

- follow the presentation and respond to questions as the presentation unfolds.
- copy example in their notebooks.



*Solution:*

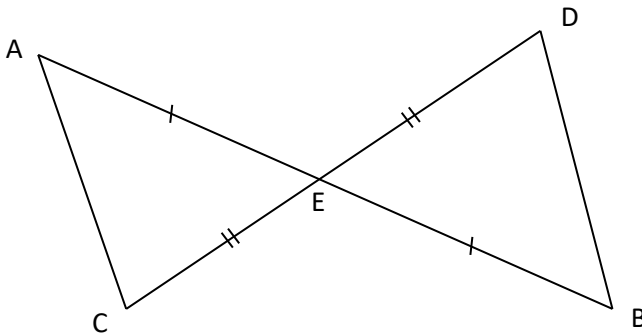
Statement	Reason
In $\triangle ABD$ and $\triangle CED$ : 1) $AD = DC$ 2) $\widehat{ADB} = \widehat{CDE}$ 3) $\widehat{BAD} = \widehat{ECD}$ $\therefore \triangle ABD \cong \triangle CED$	Given Vert. opp. $\angle$ s Alt. $\angle$ s ( $AB \parallel EC$ ) AAS

**Note:**

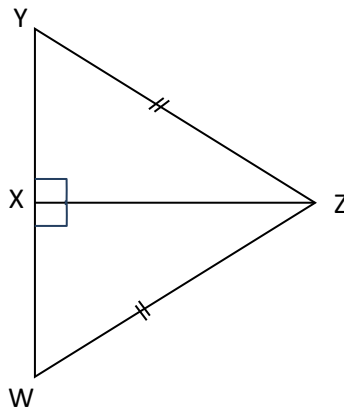
Purposely do not name the triangles at first so that learners can practice the correct notation of congruent triangles

### 8. CLASSWORK (Suggested time: 15 minutes)

1. Prove that  $\triangle ACE \cong \triangle BDE$ .



2. Prove that  $\triangle WXZ \cong \triangle YXZ$ .



## 9. CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)

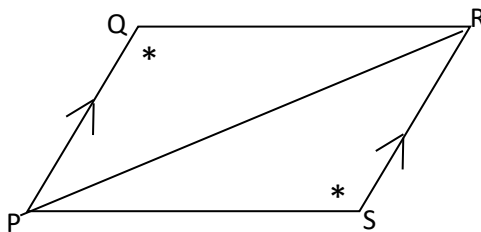
### a) Emphasise that:

- to prove two triangles congruent, one of the four conditions for congruency must be met.
- use the correct notation for congruency.
- always provide a reason for the conclusion.

- b) The primary purpose of Homework is to give each learner an opportunity to demonstrate mastery of mathematics skills taught in class. Therefore Homework should be purposeful and the principle of 'Less is more' is recommended, i.e. give learners few high quality activities that address variety of skills than many activities that do not enhance learners' conceptual understanding.

### Homework:

1. Prove that  $QR=SR$ . (Hint prove that the triangles are congruent)



2. Prove that the triangles below are congruent. Then find the size of  $\widehat{QMP}$ .

