MATHEMATICS FET LESSON PLAN

Teacher	Mr S LUTHULI	Date	9 APRIL 2025
School	ZENZELENI MASHAMASE SECONDARY SCHOOL	Grade	GRADE 11B
Duration	1 HOUR	No of learners	60
Content AREA	GEOMETRY		

Lesson Topic: EUCLIDEAN GEOMETRY: The line drawn from the centre of a circle perpendicular to a chord bisect the chord.

Prior knowledge / requisite knowledge	Learners should be knowing: • A basic understanding of circle terminology. • A basic understanding of geometry concept. • The properties of triangle.
Lesson Objectives	At the end of the lesson the learners will be able to: • State the theorem accurately. • Prove the theorem. • Apply the theorem to solve basic problems.
Teaching and learning strategy(ies)	• Direct Instruction • Indirect Instruction
Teaching and learning method(s)	• Demonstration • Problem solving
Assessment strategy/ method	• Formative assessment (through observation and participation) • Classwork (pair assessment)
Assessment tools	• Chalkboard • Chalks • Textbook (CLASSROOM MATHEMATICS)
Lesson Introduction	
Questions to determine the learners' prior knowledge.	• Can you define what a circle is? • Can you explain what a radius is? Draw an example on your paper. • What is a diameter? How is it related to the radius? • What does it mean for two lines to be perpendicular? What angle do they form?

Lesson Presentation/Development	
Teachers, Activities	**Learners' Activities**
Before introducing the theorem: • Review prior knowledge (using questions from the previous response): • Initiate a class discussion or a quick quiz to assess students' understanding of circle terminology (centre, radius, chord, diameter), perpendicular lines, congruent triangles, and isosceles triangles. Introducing the theorem • Real world connection: discuss real world examples where symmetry or equal division in circular objects might be relevant (eg., dividing a pizza equally, the design of certain mechanical parts). • Clearly state the theorem: "the line drawn from the centre of a circle perpendicular to a chord bisect the chord." Visual demonstration and exploration: • Drawing: draw a large circle on the board. Draw a chord and then, using a protractor or by estimation, draw a line from the centre perpendicular to the chord. Visually show how the chord appears to be divided into two equal parts. • Present a formal, step by step proof of the theorem.	During the introduction and exploration • Learners draw various circles and chords within them. • They then attempt to draw a line from centre of each circle that appears to be perpendicular to the chord. • They observe what happen to the chord when this perpendicular line is drawn. • After drawing the perpendicular line, learners use a ruler to measure the length of two segment of the chord. • They record their measurement and compare the lengths • Learners analyse the data they have collected. Do they consistently find that the perpendicular line from the centre divides the chord into two equal parts?
Conclusion	
Summary of the lesson	• Recap the key concepts and steps in proving the theorem. • Emphasize the importance of proving the theorem. How would help learners to apply the theorem.

Expanded opportunities	• Encourage learners to find real-life examples of the theorem • Provide additional practice worksheets for reinforcement.
Teacher reflection of the lesson	**What went well** • Engagement, understanding of concepts. **Challenges** • Time management, some learners struggled with calculations. **Improvement** • Provide more practice exercises, use technology to enhance learning.

PHYSICAL SCIENCES FET LESSON PLAN

Teacher	Mr S LUTHULI	Date	9 APRIL2025
School	ZENZELENI MASHAMASE SECONDARY SCHOOL	Grade	GRADE 10B
Duration	1 HOUR	No of learners	6
Content AREA	Electrostatics		
Lesson Topic: series circuit			
Prior knowledge / requisite knowledge	Learners should be knowing: • A basic electricity. • A circuit components and symbols • A fundamental law in electricity that describes the relationship between voltage (V), current (I), and resistance (R): V = IR		
Lesson Objectives	At the end of the lesson the learners will be able to: • Define a series circuit. • Explain the concept of a single current path in a series circuit. • Apply Ohm's law V = IR		
Teaching and learning strategy(ies)	• Direct Instruction • Indirect Instruction		
Teaching and learning method(s)	• Demonstration • Problem solving		
Assessment strategy/ method	• Formative assessment (through observation and participation) • Classwork (Individual assessment)		
Assessment tools	• Chalkboard • Chalks • Textbook (PREMIER MATHEMATICS)		
Lesson Introduction			
Questions to determine the learners' prior knowledge.	• What is electric current? Can you describe what is actually moving in a wire when there is current? • What is voltage? How is it different from current? • What is resistance?		

Lesson Presentation/Development	
Teachers, Activities	**Learners' Activities**
• Engage student: start with real world example or a question to pique their interest in electrical circuit. • Activate prior knowledge: ask questions (as suggested previously) to gauge their understanding of basic electricity concepts (current, voltage, resistance, circuit). • Introduce the concept of series circuit: define what a series circuit is, emphasizing the single path for current. • Explain the flow of current in a series circuit: emphasize that the current is the same at all points in the circuit. • Explain voltage distribution in a series circuit: explain that the total voltage is divided across the components. • Explain the addition of resistance in a series circuit. $R_{total} = R_1 + R_2$	• Answering teacher's question: responding to questions about their prior knowledge of basic electricity and circuit. • Observing demonstration: watching the teacher's initial demonstrations of simple circuits or real world and circuits. • Participating in discussion: sharing their initial thoughts and ideas about how electrical components might be connected. • Taking notes: recording key definitions, formulas and concept in their notebooks.

Conclusion	
Summary of the lesson	• Review key concepts of a series circuit. • Ask learners to share what they learned.
Expanded opportunities	• Encourage learners to find real-life examples of series connection. • Provide additional practice worksheets for learners to reinforce their understanding.
Teacher reflection of the lesson	**What went well** • Engagement, understanding of concepts. **Challenges** • Time management, some learners struggled with calculations. **Improvement** • Provide more practice exercises, use technology to enhance learning.

MATHEMATICS SENIOR PHASE LESSON PLAN

Teacher	Mr S LUTHULI	Date	9 APRIL 2025
School	ZENZELENI MASHAMASE SECONDARY SCHOOL	Grade	GRADE 8B
Duration	1 HOUR	No of learners	60
Content AREA	Algebraic expression		
Lesson Topic: scientific notation			
Prior knowledge / requisite knowledge	Learners should be knowing: • Understanding the value of each digit in a whole number and decimal number. • Understanding the concept of exponents as a shorthand for repeated multiplication. • Knowing how to read and interpret exponents.		
Lesson Objectives	At the end of the lesson the learners will be able to: • Define scientific notation as a way to express very large or small numbers using powers. • Convert whole numbers greater than or equal to 1 and less than 10 into scientific notation. • Convert numbers written in scientific notation back to standard form.		
Teaching and learning strategy(ies)	• Direct Instruction • Indirect Instruction		
Teaching and learning method(s)	• Demonstration • Problem solving		
Assessment strategy/ method	• Problem-Solving assessment • Formative assessment		
Assessment tools	• Chalkboard • Chalks • Textbook (CLASSROOM MATHEMATICS)		
Lesson Introduction			

Questions to determine the learners' prior knowledge.	• What does the digit '3' represent in the number 5,321? • What happens to the decimal point when you divide a number by 10? By 100? By 1000? Can you give an example? • What does 5^3 means? How would you calculate it?

Lesson Presentation/Development	
Teachers, Activities	**Learners' Activities**
• Assess prior knowledge: review student records and administer a quick diagnostic activity (like the questions mentioned previously) to understand their existing knowledge of place of value, powers of 10, and exponent. • Introduction and engagement: • Start with captivating real world example involving very large numbers (eg., the distance to a star, the size of a virus). • Clearly define scientific notation and its two components (coefficient and power of 10). • Model the process of converting from scientific notation back to standard form, explain the movement of the decimal point based on the exponent.	• Think: individually consider a question posed by the teacher (eg., why do we need a special way to write very large numbers?) • Pair: discuss their thoughts ideas with partner. • Work out on how to move a decimal point until there is one non-zero digit to its left.

Conclusion	
Summary of the lesson	• Review key concepts on how to move a decimal. • Ask learners to share any insights or questions.
Expanded opportunities	• Understanding the scale of the universe. • Provide additional practice exercises or real-world examples.

Teacher reflection of the lesson	**What went well** • Engagement, understanding of concepts. **Challenges** • Time management, some learners struggled with calculations. **Improvement** • Provide more practice exercises, use technology to enhance learning.

MATHEMATICS SENIOR LESSON PLAN

Teacher	Mr S LUTHULI	Date	11 APRIL 2025
School	ZENZELENI MASHAMASE SECONDARY SCHOOL	Grade	GRADE 8A
Duration	1 HOUR	No of learners	60
Content AREA	Algebraic expression		

Lesson Topic: laws of exponent: product of power

Prior knowledge / requisite knowledge	Learners should be knowing: • Understanding multiplication as repeated addition. • Identify the base and exponent • Understand the meaning of exponent: they should understand that 5^3 means 5×5×5.
Lesson Objectives	At the end of the lesson the learners will be able to: • State the product of powers laws of exponents. • Identify the base and exponents in given power.
Teaching and learning strategy(ies)	• Direct Instruction • Interactive Instruction
Teaching and learning method(s)	• Demonstration • Discussion
Assessment strategy/ method	• Summative assessment • Formative assessment
Assessment tools	• Chalkboard • Chalks • Textbook (CLASSROOM MATHEMATICS)

Lesson Introduction

Questions to determine the learners' prior knowledge.	• What is 3×4? Can you explain what this means in terms of repeated addition? • What does it mean to multiply two numbers together? • In the expression 5^3, what is the base? What is the expont?

Lesson Presentation/Development	
Teachers, Activities	**Learners' Activities**
Activate prior knowledge: • Pose question to review basic multiplication and the meaning of exponent. • Have learners write out expanded forms of exponents and vice versa. • Briefly discuss the term 'base' and 'exponent'. Connect to the topic • Present a problem like $2^2 \times 2^3$ and ask learners for their initial thoughts on how to solve it. • Explain the lesson objective clearly. • State the product of powers law: clearly present the rule: if the bases are the same, we drop one base and add the exponent. • Explain the rule: reinforce why the rule works by referring back to the expanded form examples. Emphasize that the base must be the same. • Provide clear examples: work through a few more examples demonstrating the rule with both numerical and variable bases.	• Learners actively respond to the teacher's questions about basic multiplication and the meaning of exponents. • Learners write out the multiplication form of given exponential expressions. • Learners offer their ideas on how to solve a problem like $2^2 \times 2^3$, even if they do not know the rule yet. • Learners pay attention as the teacher formally states and explains the product of powers law. • Learners may jot down the rule and key examples in their notebooks. • Learners feel comfortable asking for further explanation or example if needed. • Learners watch and listen as the teacher solve problem step- by-step.
Conclusion	
Summary of the lesson	• Review key concepts and definitions. • Ask learners to share their understanding.
Expanded opportunities	• Introduce the quotient of powers rule. • Provide additional resources for further learning.

Teacher reflection of the lesson	**What went well** • Engagement, understanding of concepts. **Challenges** • Time management, some learners struggled with calculations. **Improvement** • Provide more practice exercises, use technology to enhance learning.

MATHEMATICS SENIOR LESSON PLAN

Teacher	Mr S LUTHULI	Date	14 APRIL 2025
School	ZENZELENI MASHAMSE SECONDARY SCHOOL	Grade	GRADE 8A
Duration	1 HOUR	No of learners	60
Content AREA	Algebraic expression		

Lesson Topic: LAWS OF EXPONENT: QUOTIENT OF POWERS

Prior knowledge / requisite knowledge	Learners should be knowing: • Basic understanding of exponents. • Identify the base and exponent. • Multiplication of powers with the same base.
Lesson Objectives	At the end of the lesson the learners will be able to: • State the quotient of powers rule. • Apply the quotient of powers rule to simplify expressions with numerical base.
Teaching and learning strategy(ies)	• Direct Instruction • Indirect Instruction
Teaching and learning method(s)	• Demonstration • Problem solving
Assessment strategy/ method	• Problem-Solving assessment • Formative assessment
Assessment tools	• Chalkboard • Chalks • Textbook (CLASSROOM MATHEMATICS)

Lesson Introduction

Questions to determine the learners' prior knowledge.	• What does 4^3 mean? Can you write it out as repeated multiplication? • In the expression 7^5, what is the base? What is the exponent? • How would you read the expression x^2?

Lesson Presentation/Development	
Teachers, Activities	**Learners' Activities**
• Teacher: write the example on the board like $\frac{2\times2\times2\times2\times2}{2\times2\times2}$ • Teacher: guide students to see that common factors in the numerator and denominator can be cancelled out. Cross the pairs of 2s. • Teacher: lead students to observe the relationship between the original exponents (5 and 3) and the final exponent (2). (5 – 3 = 2) • Teacher: once students have observed the pattern, formally introduced the quotient of powers rule: if the bases are the same drop one base and subtract the exponent. • Teacher: emphasize that the base must be the same for this rule to apply. • Teacher: present examples of common mistakes and discuss why they are incorrect.	• Students work out in pairs to expand given division problems • They then physically cancel out the common factors in the numerator and denominator. • Afterwards, they discuss what is left in the numerator and try to find a relationship between the original exponents and the exponent in the simplified answer. • Learners pay attention as the teacher formally states and explains the quotient of powers law. • Learners may jot down the rule and key examples in their notebooks. • Learners feel comfortable asking for further explanation or example if needed.

Conclusion	
Summary of the lesson	• Review key concepts learned during the lesson. • Ask learners share one thing they learned.
Expanded opportunities	• Students can now simplify expressions involving both multiplication and division of powers with the same base. • Provide additional resources for further learning.
Teacher reflection of the lesson	**What went well** • Learners were engaged during the group work activity. • Learners showed a good understanding of the concept during the guided practice exercise. **Challenges**

	• Some learners struggled to understand the concept at first. • Time management was a challenge, and the lesson could have been completed more efficiently. **Improvement** • Provide more practice examples and illustrations to support understanding. • Consider allocating more time for the group work activity.

MATHEMATICS FET LESSON PLAN

Teacher	Mr S LUTHULI	Date	11 APRIL 2025
School	ZENZELENI MASHAMASE SECONDARY SCHOOL	Grade	GRADE 10B
Duration	1 HOUR	No of learners	6
Content AREA	STATISTICS		
Lesson Topic: parallel circuit			
Prior knowledge / requisite knowledge	Learners should be knowing: • Understand that electricity involves the flow of tiny, charged particles (electrons). • Knowing that current is the rate of flow of electric charge, measured in amperes (A). • Understand that voltage is the electric potential difference that drives the current, measured in volt (V). • Knowing the resistance is the opposition to the flow of current, measured in Ohms.		
Lesson Objectives	At the end of the lesson the learners will be able to: • Define a parallel circuit. • Explain voltage and current in parallel circuits • Calculate equivalent resistance in parallel circuits.		
Teaching and learning strategy(ies)	• Direct Instruction • Interactive Instruction		
Teaching and learning method(s)	• Demonstration • Discussion		
Assessment strategy/ method	• Problem-Solving assessment • Performance assessment		
Assessment tools	• Chalkboard • Chalks • Textbook		
Lesson Introduction			

Questions to determine the learners' prior knowledge.	• What is electric current, in simple terms? What unit do we use to measure it? • What is voltage? What does it do to the flow of current, and what unit is it measured in? • What is electrical resistance? What does it do to the flow of current, and what unit is used to measure it?

Lesson Presentation/Development	
Teachers, Activities	**Learners' Activities**
• Teacher: provide students with basic circuit components (batteries, wires, small light bulbs, switches). Guide them to construct a parallel circuit with two or three light bulbs connected to the same battery. • Ask them to observe the brightness of the bulbs. Then, have them unscrew one bulb. What happens to the other bulbs? How does this compare to what they might have observed in a series circuit? • Provide students with various circuit diagrams, some series and some parallel. Ask them to: • Identify which are series and which are parallel. • Trace the possible paths for current in each circuit. • Have them to calculate the equivalent resistance of each parallel combination	• Construct and experiment with simple parallel circuits: working individually or in small groups, they will physically build parallel circuits using batteries, wires, and light bulbs. They will observe the behaviour of the bulbs when one is removed and compare this to their understanding of series circuits. • Analyze and interpret diagrams: they will examine various diagrams, identifying parallel connection, tracing current paths with arrows, and predicting the behavior of the circuits under different conditions. • They will calculate the total resistance of different parrel resistor combinations using the appropriate formula. • They will participate in a class discuss about how parallel circuits are used in everyday life.

Conclusion	
Summary of the lesson	• Recap the importance of parallel connection • Emphasize the calculation of equivalent resistance.
Expanded opportunities	• Challenge student to build parallel circuits with different types of components. • Once they have a solid grasp of series and parallel circuits, introduce circuits that combine both types of connections.
Teacher reflection of the lesson	**What went well** • Learners were able to understand the concept of parallel connection **Challenges** • Some learners struggled to build the parallel circuit. **Improvement**

	• Provide more examples and practice exercises for parallel circuits.

MATHEMATICS FET LESSON PLAN

Teacher	Mr S LUTHULI	Date	11 APRIL 2025
School	ZENZELENI MASHAMASE SECONDARY SCHOOL	Grade	GRADE 11B
Duration	1 HOUR	No of learners	60
Content AREA	GEOMETRY		
Lesson Topic: Euclidean geometry: the angle at the centre is twice the angle at the circumference			

Prior knowledge / requisite knowledge	Learners should be knowing: • Circle: The set of all point equidistance from a central point • Centre: the fixed point from which all points on the circle are equidistance • Radius: a line segment joining the centre of the circle to any point on the circumference. • Arc: a portion of the circumference of a circle.
Lesson Objectives	At the end of the lesson the learners will be able to: • State the theorem: accurately state the theorem relating the angle at the centre of a circle to the angle at the circumference subtended by a given arc in a circle diagram • Prove the theorem: provide a logical and coherent proof of the theorem.
Teaching and learning strategy(ies)	• Direct Instruction • Indirect Instruction
Teaching and learning method(s)	• Demonstration • Problem Solving
Assessment strategy/ method	• Formative assessment • Summative assessment
Assessment tools	• Chalkboard • Chalks • Textbook (CLASSROOM MATHEMATICS)
Lesson Introduction	
Questions to determine the	• Can you define what a circle is? • What is the centre of a circle?

learners' prior knowledge.	• Can you describe what an arc of a circle?

Lesson Presentation/Development	
Teachers, Activities	**Learners' Activities**
• Teacher: begin by posit some of the questions we discussed earlier to activate prior knowledge about circle terminology, angles, and triangles. • Quickly review the properties of isosceles triangles and exterior angle theorem, as these are often key to the proof. • Clearly state the theorem: the angle subtended by an arc at the centre of a circle is twice the angle subtended by the same arc at any point on the remaining part of the circumference. • Present the formal proof of the theorem, breaking it down int logical steps. • Start with a clear diagram and explain each step, referring back to the prior knowledge (properties of isosceles triangles, exterior angle theorem). • Consider proving the theorem in different cases (centre inside, outside, on the angle at the circumference) separately for clarity. • Encourage students to actively participate by asking questions and explaining steps in their own words.	• Students individually reflect on the question and jot down their initial thoughts. • In a small groups, they draw accurate diagrams illustrating the theorem in each scenario. • They then write a brief explanation in their own words describing the relationship they observe In their diagrams. • The teacher guides the class through the proof step-by-step, but with active student involvement. • Students contribute their reasoning and help build the logical argument of the proof. • Students work in pairs on a worksheet containing problems that require applying the theorem to find unknown angles.

Conclusion	
Summary of the lesson	• Recap the key objectives: • State the theorem accurately • Identify central and circumference angles subtended by the same arc. • Understand and follow a logical proof of the theorem.
Expanded opportunities	• Explore more advanced real-world applications in field like astronomy (parallax) • Advanced dynamic geometry software.
Teacher reflection of the lesson	**What went well** • Learners' participation and understanding. **Challenges** • Some learners struggled with applying the theorem to find unknown angles. **Improvement** • Provide more practice exercises on applying the theorem.

MATHEMATICS SENIOR PHASE LESSON PLAN

Teacher	Mr S LUTHILI	Date	16 APRIL 2025
School	ZENZELENI MASHAMASE SECONDARY SCHOOL	Grade	GRADE 8A
Duration	1 HOUR	No of learners	60
Content AREA	ALGEBRIC EXPRESSION		
Lesson Topic: RASING A POWER TO POWER			
Prior knowledge / requisite knowledge	Learners should be knowing: • Understanding of exponents: they should know what an exponent means. • Should be familiar with terms like 'base,' 'exponent,' and 'power' • Multiplying powers with same base.		
Lesson Objectives	At the end of the lesson the learners will be able to: • State the rule for raising a power to power. • Explain why the rule raising power to power works using the definition of exponent. • Simplify expressing involving multiple exponent rules, including raising a power to power.		
Teaching and learning strategy(ies)	• Direct Instruction • Indirect Instruction		
Teaching and learning method(s)	• Problem solving		
Assessment strategy/ method	• Formative assessment • Summative assessment		
Assessment tools	• Chalkboard • Chalks • Textbook (PREMIER MATHEMATICS)		
Lesson Introduction			
Questions to determine the learners' prior knowledge.	• What does 4^3 mean? Can you write it out as repeated multiplication? • What is the base and what is the exponent in the expression 6^3? • Simplify the expression $5^4 \times 5^3$.		

Lesson Presentation/Development	
Teachers, Activities	**Learners' Activities**
• Teacher: explore what happen when we raise a power to another power. Consider $(2^2)^2$. What does the outer exponent tell us to do with the entire base, which in this case is 2^2? • Multiply 2^2 by itself. $2^2 \times 2^2$ • Explain the rule that says the outer exponent multiply all the exponents of the inner power. • Provide more examples until they understand the rule. • Provide a worksheet with several examples. • Circulate to guide and answer questions, encouraging them to focus on the relationship between the original exponents and the final exponent.	• Learners will work through examples like $(2^2)^2$ by expanding the outer exponent to see repeated multiplication of the inner power. They will then expand the inner powers to count the total number of base being multiplied, looking for a connection between the original exponents and the final exponent. • Learners will complete worksheet with various expressions. • Learners will participate in a class discussion, brainstorming potential scenarios in math, science, or everyday life where the concept of a power raised to another power might appear (even in simplified terms)

Conclusion	
Summary of the lesson	• Review key concepts and features of raising a power to power. • Ask learners to share one thing they learned.
Expanded opportunities	• Provide additional activities allow learners to work on their own. • Encourage learners to find and analyse real-world examples of raising a power to power
Teacher reflection of the lesson	**What went well** • Learners were able to identify key features of raising a power to power **Challenges** • Some learners struggled with understanding the concept **Improvement** • Provide additional practice

MATHEMATICS SENIOR PHASE LESSON PLAN

Teacher	Mr S LUTHULI	Date	14 APRIL 2025
School	ZENZELENI MASHAMASE SECONDARY SCHOOL	Grade	GRADE 10B
Duration	1 HOUR	No of learners	6
Content AREA	ELECTROSTATICS		
Lesson Topic: Ohm's law			
Prior knowledge / requisite knowledge	Learners should be knowing: • Electric charge: the fundamental property of matter that can be positive or negative. • Electric current: the flow of electric charge. • Voltage (potential difference): the electric potential energy difference between two points in a circuit, which drives the flow of charge. • Resistance: the opposition to the flow of electric current in a material or component.		
Lesson Objectives	At the end of the lesson the learners will be able to: • Define Ohm's law in words • Apply Ohm's law to solve problems.		
Teaching and learning strategy(ies)	• Direct Instruction • Indirect Instruction		
Teaching and learning method(s)	• Demonstration • Problem solving		
Assessment strategy/ method	• Formative assessment • Problem Solving assessment		
Assessment tools	• Chalkboard • Chalks • Textbook		
Lesson Introduction			

Questions to determine the learners' prior knowledge.	• Wha is electric current? • What is voltage? In simple terms, what does it puss in a circuit? • What is resistance? What does it do to the flow of electric current?

Lesson Presentation/Development	
Teachers, Activities	**Learners' Activities**
• Teacher: use a simple demonstration with pipes of varying widths (representing resistance) and a pump (representing voltage) to show how the flow rate (represent current) changes. Narrow pipes restrict flow, just like high resistance limits current. Increasing the pump pressure increases flow, similar to how increased voltage increases current. • Set up a basic circuit with a battery, a light bulb, an ammeter, and a variable resistor. As the teacher adjusts the resistance, students can observe the changes in current (ammeter reading) and the brightness of the bulb. Discuss how increasing resistance decrease current and vice versa (at constant voltage	• Learners observe the brightness of the bulb with different battery voltage and different resistors. They discuss how the brightness changes and relate it intuitively to the flow of current. • Even without formal measurements, they can start to see that more 'push' (voltage) leads to more 'flow' (dimmer bulb/ less current). • They calculate the ratio of voltage to current (V/I) and compare it to the known resistance value.

Conclusion	
Summary of the lesson	• Review key concepts • Ask learners to share ideas on what they have learned.
Expanded opportunities	• Provide additional exercise related to Ohm's law questions. • Encourage learners to explore real-world applications of Ohm's law.
Teacher reflection of the lesson	**What went well** • Learners were able to observe the brightness of the bulb **Challenges** • Some learners struggled with calculations. **Improvement** • Provide additional practice on calculations using Ohm's law

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MATHEMATICS SENIOR PHASE LESSON PLAN

Teacher	Mr S LUTHILI	Date	23 APRIL 2025
School	ZENZELENI MASHAMASE SECONDARY SCHOOL	Grade	GRADE 11B
Duration	1 HOUR	No of learners	60
Content AREA	GEOMETRY		
Lesson Topic: EUCLIDEAN GEOMETRY: tangents from the same point are equal			
Prior knowledge / requisite knowledge	Learners should be knowing: • Basic circle terminology • Understanding of a tangent: a line touches a circle exactly one point. • Basic understanding of triangles		
Lesson Objectives	At the end of the lesson the learners will be able to: • Accurately state the theorem that tangents drawn from an external point to a circle are equal in length. • Prove the theorem • Apply the theorem		
Teaching and learning strategy(ies)	• Direct Instruction • Indirect Instruction		
Teaching and learning method(s)	• Problem solving		
Assessment strategy/ method	• Formative assessment • Summative assessment		
Assessment tools	• Chalkboard • Chalks • Textbook (PREMIER MATHEMATICS)		
Lesson Introduction			
Questions to determine the learners' prior knowledge.	• What is a tangent to a circle? How many points of contact does a tangent line have with a circle? • Draw a circle and line that is tangent to it. Label the point of tangency. • What can you say about the angle formed between a radius of a circle and a tangent line at the point of contact?		

Lesson Presentation/Development	
Teachers, Activities	**Learners' Activities**
• Teacher: introduce the theorem (informally). State the theorem clearly and concisely. • Have students draw their own circles and an external point. Instruct them to draw two tangents from this point to the circle. Encourage them to visually compare the lengths of the tangent segments. • Construct the proof (step-by-step) lead the students through the formal proof of the theorem • Summarize the proof: after completing the proof, summarize the key steps and the logical flow.	• Learners carefully draw a circle, an external point, and two tangents from that point. Use a ruler to measure the length of the two tangent segment and record their findings. Compare their measurements with classmates. • Actively follow the teacher's step-by-step construction of the proof on their own diagram. Ask clarifying questions if they don't understand a step. • Pay close attention as the teacher works through example problems, noting the steps involved in applying the theorem • Solve the provided practice problem collaboratively in small group: discuss their solutions and reasoning with group members.

Conclusion	
Summary of the lesson	• Review key concepts and features of proving the theorem. • Ask learners to share one thing they learned.
Expanded opportunities	• Provide additional activities allow learners to work on their own. • Encourage learners to find and analyse real-world examples of tangent from the same point.
Teacher reflection of the lesson	**What went well** • Learners were able to identify key features of proving the theorem **Challenges** • Some learners struggled with understanding the concept **Improvement** • Provide additional practice

MATHEMATICS SENIOR PHASE LESSON PLAN

Teacher	Mr S LUTHILI	Date	23 APRIL 2025
School	ZENZELENI MASHAMASE SECONDARY SCHOOL	Grade	GRADE 11B
Duration	1 HOUR	No of learners	60
Content AREA	GEOMETRY		
Lesson Topic: EUCLIDEAN GEOMETRY: tan chord theorem			
Prior knowledge / requisite knowledge	Learners should be knowing: • Basic circle terminology. • Angles in the same segment theorem. • Angle In semicircle theorem		
Lesson Objectives	At the end of the lesson the learners will be able to: • State the tangent chord theorem accurately • Prove the theorem • Apply the theorem		
Teaching and learning strategy(ies)	• Direct Instruction • Indirect Instruction		
Teaching and learning method(s)	• Problem solving		
Assessment strategy/ method	• Formative assessment • Summative assessment		
Assessment tools	• Chalkboard • Chalks • Textbook (PREMIER MATHEMATICS)		
Lesson Introduction			
Questions to determine the learners' prior knowledge.	• What is a tangent? • What is a chord in circle? Can you draw an example? • Can you point out the point of contact (or tangency) in a diagram where a line touches a circle?		

Lesson Presentation/Development	
Teachers, Activities	**Learners' Activities**
• Teacher: clearly state the tangent chord theorem: the angle between a tangent to a chord drawn from the point of contact is equal to the angle in the alternate segment. • Use a well-labelled diagram to visually represent the theorem, clearly highlighting the tangent, the chord, the angle between them, and the angle in the alternate segment. • Prove the theorem formally.	• Learners will actively participate in the review by answering the teacher's questions about basic circle terminology, angle properties, and relevant circle theorem. • Learners will work in a small group with pre-drawn circle. • They will carefully measure the angle between the tangent and the chord using protractors. • They will then measure the angle in the alternate segment. • They will discuss their findings with their group members and try to articulate the observed relationship.

Conclusion	
Summary of the lesson	• Review key concepts and features of proving the theorem. • Ask learners to share one thing they learned.
Expanded opportunities	• Provide additional activities allow learners to work on their own. • Encourage learners to find and analyse real-world examples of tangent from the same point.
Teacher reflection of the lesson	**What went well** • Learners were able to identify key features of proving the theorem **Challenges** • Some learners struggled with understanding the concept **Improvement** • Provide additional practice

MATHEMATICS FET LESSON PLAN

Teacher	Mr S LUTHILI	Date	5 MAY 2025
School	ZENZELENI MASHAMASE SECONDARY SCHOOL	Grade	GRADE 11B
Duration	1 HOUR	No of learners	60
Content AREA	FUNCTIONS AND GRAPHS		

Lesson Topic: The parabola (quadratic function)

Prior knowledge / requisite knowledge	Learners should be knowing: • The concept of a function: understanding that a function is a relationship between two sets of values where each input has a unique output. • Understanding of variables and constant. • Simplifying algebraic expressions.
Lesson Objectives	At the end of the lesson the learners will be able to: • Define a quadratic function and recognise its standard form. • Explain the shape of a parabola and its key features. • Sketch the graph of quadratic function.
Teaching and learning strategy(ies)	• Direct Instruction • Indirect Instruction
Teaching and learning method(s)	• Problem solving
Assessment strategy/ method	• Formative assessment • Summative assessment
Assessment tools	• Chalkboard • Chalks • Textbook (Kevin Smith)

Lesson Introduction

Questions to determine the learners' prior knowledge.	• Explain in your own words what a function is? • If $f(x) = 2x - 3$, find the value of $f(4)$. • Describe one way you can represent a function (other than an equation). (looking for a table or graph).

Lesson Presentation/Development	
Teachers, Activities	**Learners' Activities**
• Teacher: introduce the turning point equation and the standard form of quadratic function. • The teacher refers to the textbook (Kevin Smith) on page 81. • Facilitate observation and discussion about: • The U-shape (parabola) • The effect of the sign of "a" (opening upward and downward). • The effect of the magnitude of "a" (narrower or wider parabola). • Work with shifting the parabola horizontally (left and right) as well as vertically. When sketching a parabola, the equation of a parabola will usually be presented in 2 ways: ➢ $Y= a(x-p)^2 +q$ ➢ $Y= ax^2+bx+c$ ➢ Explain that when the parabola has the form of $Y= a(x-p)^2 +q$ ➢ a-shape ➢ p- x value of the turning point ➢ q- y value of the turning point • lead them on how to sketch a parabola when given a turning point equation.	• Learners will actively participate in the review by answering the teacher's questions about basic prior knowledge of parabola function. • Taking notes: recording key definitions, formulas and concept in their notebooks. • Learners work individual or in small groups to find and document real-world example of parabolic shapes (either physically around the school/ home or through provided images/ videos). • As a class, they can share their findings and discuss why these shapes might be mathematically significant.

Conclusion	
Summary of the lesson	• Review key concepts and features of quadratic function. • Ask learners to share one thing they learned.
Expanded opportunities	• Provide additional activities allow learners to work on their own. • Encourage learners to find and analyse real-world examples of quadratic function.
Teacher reflection of the lesson	**What went well** • **Challenges** • **Improvement** •

MATHEMATICS SENIOR PHASE LESSON PLAN

Teacher	Mr S LUTHILI	Date	5 MAY 2025
School	ZENZELENI MASHAMASE SECONDARY SCHOOL	Grade	GRADE 8A
Duration	1 HOUR	No of learners	60
Content AREA	FUNCTIONS AND GRAPH		

Lesson Topic: Functions and relationship: input and output values

Prior knowledge / requisite knowledge	Learners should be knowing: • They should be proficient in addition, subtraction, multiplication, and division with whole numbers, fractions, and decimals. • Patterns and sequences • Variables and simple algebraic expressions
Lesson Objectives	At the end of the lesson the learners will be able to: • Determine the input and output values. • Determine rule for patterns and relationships using flow diagrams
Teaching and learning strategy(ies)	• Direct Instruction • Indirect Instruction
Teaching and learning method(s)	• Problem solving
Assessment strategy/ method	• Formative assessment • Summative assessment
Assessment tools	• Chalkboard • Chalks • Mathematic lesson plan • chart

Lesson Introduction

Questions to determine the learners' prior knowledge.	• What does it mean when we use a letter like "x" in maths? • Look at this sequence: 1, 2, 3, 4…what's the rule for getting from one number to the next • If I say 'a number plus 3 equals 7' how could you find that number?

Lesson Presentation/Development	
Teachers, Activities	**Learners' Activities**
• Teacher: present a few simple patterns • Ask students to identify the next term and the rule. • Define the function as a specific type of relationship where each input has exactly one output. • Introducing input and output terminology: • Explicitly define 'input' as the starting value and 'output' as the resulting value. • Use arrows or diagrams to visually represent the flow from input to output through the 'function rule' • Show how to organize input and output values in flow diagram.	• Their task is to identify the pattern, determine the next few terms, and try to describe the rule in their own words. • They can work individually or in small groups and then share their findings with the class. • In pairs or small group, learners brainstorm where one quantity depends on another. • This active participation reinforces the idea of a function as a hidden rule linking inputs and outputs.

Conclusion	
Summary of the lesson	• Review key concepts and features of quadratic function. • Ask learners to share one thing they learned.
Expanded opportunities	• Provide additional activities allow learners to work on their own. • Encourage learners to find and analyse real-world examples of quadratic function.
Teacher reflection of the lesson	**What went well** • **Challenges** • **Improvement** •