Province of the
EASTERN CAPE
DEPARTMENT OF EDUCATION

MATHEMATICS

EXEMPLAR LESSON PLANS ON

GRADE 11

Attached herewith, please find suggested lesson plans for term 1 of MATHEMATICS Grade 11
Please note that these lesson plans are to be used only as a guide and teachers are encouraged to develop their own learner activities to supplement and/or substitute some of the activities given here (depending on the school environment, number and type of learners in your class, the resources available to your learners, etc).

Lesson planning is a necessary exercise for each and every individual teacher however it helps when teachers sometimes plan together as a group. This interaction not only help teachers to understand how to apply the Learning Outcomes (LOs) and Assessment Standards (ASs) but also build up the confidence of the of teachers in handling the content using new teaching strategies.
The Learning Outcomes for the other subjects with which one can integrate have not been identified. The other subjects with which possible integration can be made have been listed. The Lesson plan could therefore change if the other subject/s, their LOs and Ass could be clearly stated. Do not forget to build in the tasks for the Programme of Assessment into your Lesson Plans.
Strengthen your efforts by supporting each other in clusters and share ideas.
Good Luck with your endeavors to improve Teaching, Learning and Assessment.

LESSON PLAN: 1

Subject: Mathematics		Grade 11	
Lesson Plan: Number patterns		Number of Activities 3	
Duration: 4H 30 Min		Week 1-2 / Date	
Context: Number patterns			
Link with previous lesson: Grade 10 Revision on Number Patterns – linear			
CORE CONTENT: (KSV) KNOWLEDGE (K): Investigating number patterns, general term, term value and number of terms SKILLS (S): Investigating, calculating, VALUES (V): appreciation , respect			
	ACTIVITY 1	**ACTIVITY 2**	**ACTIVITY 3**
Activity Content	Investigating number patterns	Determining general term	Calculating term value and number of terms
LO,s and AS's	11.1.3 (a), (b)	11.1.3 (a), (b)	11.1.3 (a), (b)
Detail of Activity	Learners given worksheets to Investigate and identify number patterns including but not limited to those with constant difference between consecutive terms (linear patterns) and constant second difference (quadratic patterns) also constant ratios (exponential patterns)	The educator gives worksheet to learners to extend the pattern and explain how the terms are generated and determine the general term e.g Determine the general term of the following sequence: 5;11;21;35	Learners work I n groups to calculate the term value and the number of terms in a sequence of any pattern. e.g Determine the next 2 terms for the sequence and state whether the general term is linear , quadratic or cubic
Teaching Methods	Discussion, question and answer	Question and answer	Discussion, question and answer
Assessment Strategy :Form : Tool :Method	Class work home work Memo Educator, individual	Class work home work Memo Educator, individual	Class work, home work , test Memo Educator, individual
Expanded Opportunities:	Different examples and remedial work	Different examples and remedial work	Mixed questions and remedial work
Resources	Work sheets, calculator	Work sheets, calculator	Work sheets, calculator
Teacher reflection			

LESSON PLAN: 2

Subject: Mathematics		Grade 11
Lesson Plan: Non Real Numbers; exponents and surds		Number of Activities 3
Duration: 4H 30 Min x2		Week 3-4 / Date

Context: Mathematical – non real numbers and exponents
Link with previous lesson: Real numbers systems in AS 10.1.1. and 10.1.2
KNOWLEDGE (K): Working with numbers
SKILLS (S): Calculating (operating/adding multiplying, dividing various types of numbers)
VALUES (V): appreciation of numbers and error of margins

	ACTIVITY 1	ACTIVITY 2	ACTIVITY 3
Activity Content	Non real numbers	Exponents	Surds
LO,s and AS's	11.1.1	11.1.2a	11.1.2 b, c
Detail of Activity	Teacher gives learners a class work for them to revise rational and irrational numbers from grade 10. Introduces numbers of type $\sqrt{-1}$; $\sqrt{-4}$; $\sqrt[4]{-16}$ ext. Teacher asked learners to try classify these numbers . Learners discover or teacher introduces the concept of non real numbers, imaginary numbers	Educator gives learners a class work where they will revise all the laws of exponents. Educator introduces learners to rational exponents . Derivation of these laws and allows discussions. Educator gives more examples for learners to work out. $a^0 \div a = a^{0-1} = a^{-1}$ ext	Educator gives learners a worksheet to work on multiplication and division off surds. Learners are given class work to demonstrate error margins in context of rounding off answers correct to one, two or three decimal places where required. *Example: Rounding off the interest rate to one decimal place may not yield the desired result.* Educator to note that error margins are seen in the context of rounding off answers connected to one, two or three decimal required.
Teaching Methods	Discussion, question and answer	Discussion, Question and answer	Discussion, Question and answer
Assessment Strategy :Form : Tool :Method	Class work home work Memo Educator, individual ,peer,	Class work home work Memo Educator, individual, peer	Class work home work Memo Educator, individual, peer
Expanded Opportunities:	Different examples and remedial work	Different examples and remedial work	Different examples and remedial work
Resources	Work sheets, calculator	Work sheets, calculator	Work sheets, calculator

LESSON PLAN: 3

Subject: Mathematics Lesson Plan: Analytical Geometry Duration: 4H 30 Min x2			Grade 11 Number of Activities 3 Week 5-6/ Date
Context: Mathematical – real life situations			
Link with previous lesson: Number patterns, real numbers			
KNOWLEDGE (K): equation of a line through 2 points , Inclination of a line SKILLS (S): Derive, application, drawing , calculation VALUES (V): Appreciation			
	ACTIVITY 1	**ACTIVITY 2**	**ACTIVITY 3**
Activity Content	Revision Analytical geometry	Derive formula : equation of a line through 2 points	Inclination of a line
LO,s and AS's	LO3 AS 10.3.3	LO3 AS 11.3.3	LO3 AS 11.3.3
Detail of Activity	Teacher does an overview of grade 10 co-ordinate geometry using a worksheet.	Teacher explains how to derive the formula for the equation of a line through two given points, the equation of a line through one point parallel or perpendicular to a given line and class work on relevant section	Learners given a worksheet to use the Cartesian co-ordinate system to derive and apply: • the equation of a line through two given points • the equation of a line through one point and parallel or perpendicular to a given line • the inclination of a line.
Teaching Methods	Discussion, question and answer	Discussion, Question and answer	Discussion, Question and answer
Assessment Strategy :Form : Tool :Method	Class work home work Memo Educator, individual ,peer,	Class work home work Memo Educator, individual, peer	Class work home work Memo Educator, individual, peer
Expanded Opportunities:	Different examples and remedial work	Different examples and remedial work	Different examples and remedial work
Resources	Work sheets, calculator	Work sheets, calculator	Work sheets, calculator

LESSON PLAN: 4

Subject: Mathematics	Grade 11
Lesson Plan: Manipulate algebraic expressions	Number of Activities 3
Duration: 4H 30 Min	Week 7/ Date

Context: Mathematical – real life situations

Link with previous lesson: Number patterns, real numbers

KNOWLEDGE (K): Manipulate algebraic expressions:
SKILLS (S): Derive, application, , calculation VALUES (V): Appreciation

	ACTIVITY 1	**ACTIVITY 2**	**ACTIVITY 3**
Activity Content	Factorization	completing the square	completing the square
LO,s and AS's	LO2 AS 11 .2..4	LO2 AS 11 .2..4	LO2 AS 11 .2..4
Detail of Activity	Facilitates- explains steps involved in solving equations and gives feedback on activities done by the learners. **DISCUSSION:** 1.To solve quadratic equation by **factorization** Simplify until the right-hand side of the equation is 0. Factorise the left-hand side. Use the property of zero-product [if (A) (B)= 0 then A = 0 or B = 0] to get two linear equations. Solve each linear equation Check the answers	To solve quadratic equations by **completing the square:** the goal is to have a perfect square on the LHS. From activity 2 it is clear that a perfect square is found when the last term, c (or the constant) equals $\underline{b^2}$ 2^2, which is the coefficient of x, halved and squared. $ax^2 + bx + c$ can be adapted to a perfect square, if a = 1 and when the coefficient of x, b is halved and squared, it equals c.	Teacher gives a work sheet to the learners to solve for x in $ax^2 + bx + c = 0$ by completing a square. The roots become $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ a formula to solve quadratic equation.
Teaching Methods	Question and answer	Discussion, Question and answer	Discussion, Question and answer
Assessment Strategy :Form : Tool :Method	Class work home work Memo Educator, individual ,peer,	Class work home work Memo Educator, individual, peer	Class work ,home work Memo Educator, individual, peer
Expanded Opportunities:	Different examples and remedial work		

Resources	Work sheets, calculator	Work sheets, calculator	Work sheets, calculator

LESSON PLAN: 5

Subject: Mathematics		Grade 11
Lesson Plan: Algebraic Expression ;		Number of Activities 3
Duration: 4H 30 Min		Week 8/ Date
Context: Simplification and factorization of expressions.		
Link with previous lesson: Factorization		
KNOWLEDGE (K): Simplification and factorization of expressions. SKILLS (S): Simplify, calculate VALUES (V): appreciation		

	ACTIVITY 1	**ACTIVITY 2**	**ACTIVITY 3**
Activity Content	Revision	Manipulation of algebraic expressions	Manipulation of algebraic expressions
LO,s and AS's	LO 2 AS 10.2.4 a-d	LO 2 AS 11 4 a, b	LO2 AS 11 .2.4 b
Detail of Activity	Teacher provides learners with worksheet, class work, assignment to revise the following 1. Multiplying expressions 2. Factorizing expressions 3. Simplifying fractions with monomial denominators	Teacher provides learners with a worksheet to : 1..Manipulate algebraic expressions using various methods of factorization. 2. Simplify algebraic fractions with binomial denominators	Teacher gives learners class work to do mixed questions. Teachers must note that at this stage learners may use the long division method to factorize the third degree polynomials in order to simplify some expressions
Teaching Methods	Discussion, question and answer	Discussion, question and answer	Discussion, question and answer
Assessment Strategy :Form	Worksheet, class work, assignment	Worksheet, classwork, assignment	Worksheet, classwork, assignment
: Tool	Memo	Memo	Memo
:Method	Self, peer, group and educator	Self, peer, group and educator	Self, peer, group and educator
Expanded Opportunities:	Different examples and remedial work	Different examples and remedial work	Different examples and remedial work
Resources	Worksheet, calculator	Worksheet, calculator	Worksheet, calculator
Teacher reflection			

LESSON PLAN: 6

Subject: Mathematics			Grade 11
Lesson Plan: Simple and Compound Decay			Number of Activities 3
Duration: 4H 30 Min			Week9/ Date

Context: Finance
Link with previous lesson: Grade 10 Simple and compound growth
CORE CONTENT: (KSV) KNOWLEDGE (K): Simple and Compound Decay SKILLS (S): Calculate, problem solving VALUES (V): appreciation

	ACTIVITY 1	ACTIVITY 2	ACTIVITY 3
Activity Content	Terminology in finance	Simple and compound growth	Simple and compound decay
LO,s and AS's	10.1.4 and 11.1.4	11.1.4	11.1.4
Detail of Activity	Teachers introduces learners to the vocabulary : Growth/ appreciation Decay/depreciation Book value Scrap value Flat rate depreciation Straight line depreciation Reducing balance depreciation Nominal rate Effective rate	Teacher gives learners worksheets on simple growth and compound growth. - The simple growth ; $A= P(1+ni)$ - The compound growth $A = P(1+i)^n$ e.g 1.What will R5600 amount to if it is invested for 6 years at (a) 6,3% p.a Simple interest (b) 6,3 % p.a compound interest. 2.What will R16200amount to in 5 years at 8,8 % compounded quarterly.	Teacher gives learners worksheets on simple decay and compound decay. - The simple decay ; $A= P(1-ni)$ - The compound decay $A = P(1-i)^n$ e.g 1. Calculate the book value of a machine which cost R45 000 at the end of 4 years if depreciation is calculated at 16% p.a. (i) at a flat rate (ii) on a reducing balance
Teaching Methods	Discussion, question and answer	Discussion, question and answer	Discussion, question and answer
Assessment Strategy :Form : Tool :Method	Class work, worksheet, Memo Peer, self, group, educator	Class work, worksheet, Memo Peer, self, group, educator	Class work, worksheet, Memo Peer, self, group, educator
Expanded Opportunities:	Additional question papers given	Additional question papers given	Additional question papers given
Resources	Calculator, exemplars,	Calculator, exemplars, worksheet	Calculator, exemplars, worksheet

	worksheet		

LESSON PLAN: 7

Subject: Mathematics			Grade 11
Lesson Plan: Time Line to calculate interest			Number of Activities 2
Duration: 4H 30 Min			Week10 / Date
Context: Financial matters			
Link with previous lesson: Simple and Compound Decay			
KNOWLEDGE (K): Time Line to calculate interest		SKILLS (S): Calculation, VALUES (V): appreciation	
	ACTIVITY 1	**ACTIVITY 2**	
Activity Content	Time line	Finding Interest: Mixed Questions	
LO,s and AS's	11.1.4	11.1.4	
Detail of Activity	Teacher introduces learners of the use of a time line to show the information where the interest rates or the compounding periods change or where a number of deposits or deposits or withdrawals are made. e.g. Paul invested R5000 in abank for a period of 6 years at 6,5 % p.a. compounded biannually for he first 2 years and at 7,2% p.a. compounded monthly for the remaining period. Calculate how much his investment is worth after 6 years.	Teacher provides learners with a worksheet to calculate a mixed number of questions relating to compound decay, compound growth and time line to calculate interest.	
Teaching Methods	question and answer	Discussion, question and answer	
Assessment Strategy :Form : Tool :Method	Class work, worksheet, Memo Peer, self, group, educator	Class work, worksheet, Memo Peer, self, group, educator	
Expanded Opportunities:	Additional question papers given		

| Resources | Calculator, exemplars, worksheet |