Province of the
EASTERN CAPE
DEPARTMENT OF EDUCATION

MATHEMATICS

EXEMPLAR LESSON PLANS ON GRADE 10

Attached herewith, please find suggested lesson plans for term 1 of MATHEMATICS Grade 10.
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 Lesson Plan: Multiplication and Factorization Duration: 4H 30 Min			Grade 10 Number of Activities 3 Week 1 / Date
Context: Mathematical , Algebraic expressions			
Link with previous lesson: Multiplication of mathematical expressions in grade 9			
KNOWLEDGE (K): Algebraic expressions SKILLS (S): Problem solving, calculating VALUES (V): appreciation			
	ACTIVITY 1	**ACTIVITY 2**	**ACTIVITY 3**
Activity Content	Revision: Multiplication	Factorization of expressions	Methods of factorization
LO,s and AS's	10.2.4(a)	10.2.4b	10.2.4c
Detail of Activity	Teacher facilitates revision of multiplication of 1, Monomial x polynomial 2. binomial x binomial 3.binomial x trinomial Using various methods i.e. distributive laws, FOIL, Inspection	Learners given worksheet to revise factorization of expressions using the following methods; 1. Common factor 2. Difference of two squares 3. trinomial	Learners discover and use different ways of factorizing the following expressions 1. Grouping 2. Sum/ difference of two cubes
Teaching Methods	Question and answer, Discussion,	Question and answer, Discussion,	Question and answer, Discussion,
Assessment Strategy :Form : Tool :Method	Worksheet, class work, assignment Memo, checklist Self, peer, group, educator	Worksheet, class work, assignment Memo, checklist Self, peer, group, educator	Worksheet, class work, assignment Memo, checklist Self, peer, group, educator
Expanded Opportunities:	Sum and difference of two cubes	Sum and difference of two cubes	Sum and difference of two cubes
Resources	Worksheet,	Worksheet,	Worksheet,
Teacher reflection			

LESSON PLAN: 2

Subject: Mathematics Lesson Plan: Factorization, algebraic expressions Duration: 4h30			Grade 10 Number of Activities 3 Week 2 / Date
Context: Factorization, algebraic expressions , solution of equations simple quadratics equations which factorize			
Link with previous lesson: Multiplication, factorization			
KNOWLEDGE (K): Factorization, algebraic expressions SKILLS (S): problem solving, calculating VALUES (V): appreciation			
	ACTIVITY 1	**ACTIVITY 2**	**ACTIVITY 3**
Activity Content	Factorization	Algebraic expressions	Solution of Simple quadratics equations
LO,s and AS's	10.2.4 a,b, c	10.2.4d	LO2 AS 10.2.5a,b,c
Detail of Activity	Teacher facilitates revision of complex expressions through a discussion where learners internalize the route by means of a flow chart: 1. Take out the common factor 2. Count the number of terms in the expressions 3. If 2 terms – check for difference of two squares or sum/difference of 2 cubes 4. 3 terms- factorize as trinomial 5. 4 terms – factorize by grouping	Teacher gives learners a worksheet where they factorize expressions in fractions with monomial denominators - Using various methods of factorization - Cancelling out the common factor where possible. - To see where the common factor cannot be cancelled out.	Learners given worksheet where they solve simple quadratic equations which factorize. - Using various methods of factorization - Cancelling out the common factor where possible. - To see where the common factor cannot be cancelled out.
Teaching Methods	Question and answer,	Question and answer, Discussion,	Question and answer, Discussion,
Assessment Strategy :Form : Tool :Method	Class work, homework, discussion, investigation Memo, checklist, rubric, Peer, self, group, educator	Class work, homework, discussion, investigation Memo, checklist, rubric, Peer, self, group, educator	Class work, homework, discussion, investigation Memo, checklist, rubric, Peer, self, group, educator
Expanded Opportunities:	Division of algebraic expressions and solve equations that cannot factorize		

Resources	Calculator, exemplars, worksheet

LESSON PLAN: 3

Subject: Mathematics Lesson Plan: Volume and surface area Duration: 4H30			Grade 10 Number of Activities 3 Week3 / Date
Context: Real life situations, mathematical			
Link with previous lesson: Perimeter, area formulae of 2D figures, Surface area of right prisms and cylinders			
CORE CONTENT: (KSV) KNOWLEDGE (K): Surface area and volume SKILLS (S): Calculation investigation VALUES (V): appreciation			
	ACTIVITY 1	**ACTIVITY 2**	**ACTIVITY 3**
Activity Content	Area and surface area	Surface area	Volume
LO,s and AS's	LO3 AS 10.3.1	LO3 AS 10.3.1	LO3 AS 10.3.1
Detail of Activity	Learners provided with a worksheet where they write down perimeter and area of various figures, write down the ratio of the side lengths and find correlation between the ratio and sides and perimeter	Learners are given worksheets to understand and determine the effect on the volume and surface area of right prisms and cylinders, of multiplying any dimension by a constant factor k. e.g 1. Investigate how the surface area of a closed rectangular prism with dimensions a x b x c units will change if (a) 1 of its dimensions is multiplied by 3. 2. Investigate how the surface area of a closed cylinder with radius r and height h will be affected if r is multiplied by 5	Learners are given worksheets to understand and determine the effect on the volume and surface area of right prisms and cylinders, of multiplying any dimension by a constant factor k. e.g What will happen to the volume of a cylinder if only the radius is multiplied by k and k<17
Teaching Methods	, Discussion, investigation	Discussion, investigation	, Discussion, investigation
Assessment Strategy :Form : Tool :Method	Class work, homework, discussion, investigation Memo, checklist, rubric, Peer, self, group, educator	Class work, homework, discussion, investigation Memo, checklist, rubric, Peer, self, group, educator	Class work, homework, discussion, investigation Memo, checklist, rubric, Peer, self, group, educator
Expanded Opportunities:	Transformation	Transformation	Transformation

Resources	Calculator, exemplars, worksheet

LESSON PLAN: 4

Subject: Mathematics Lesson Plan: Rational Numbers Duration: 4h30			Grade 10 Number of Activities 3 Week 4 / Date
Context: Mathematical, Real Life situations			
Link with previous lesson: Rational numbers			
CORE CONTENT: (KSV) KNOWLEDGE (K): Rational Numbers SKILLS (S): Calculation, Problem solving VALUES (V): appreciation			
	ACTIVITY 1	**ACTIVITY 2**	**ACTIVITY 3**
Activity Content	Rational Numbers	Rational Numbers	Rational Numbers
LO,s and AS's	10.1..1	10.1.1.	10.1.1
Detail of Activity	Teacher facilitates the revision of the following: 1. The 4 basic operations . 2. Factors; multiples; powers and roots 3. Common and decimal fractions. 4. Rounding off numbers 5. Calculations using calculator	Worksheet given to learners to introduce number system with emphasis on the following: 1. Rational and irrational numbers in addition to Natural, whole and Integers. 2. How to write terminating and recurring decimals as common fractions and vice versa. 3. Has to locate the integers between which surds lie. 4. Finding the position of surds on a number line.	The educator introduces the learners and give worksheets to the set builder notation and interval notation using number lines. The teacher gives learners homework in rounding of rational and irrational numbers to an appropriate degree of accuracy.
Teaching Methods	Question and answer, Discussion,	Question and answer, Discussion,	Question and answer, Discussion,
Assessment Strategy :Form : Tool :Method	Worksheet, class work Memo, checklist Self, peer, group, educator	Worksheet, class work Memo, checklist Self, peer, group, educator	Worksheet, class work Memo, checklist Self, peer, group, educator
Expanded Opportunities:	Mixed questions , Venn diagrams		
Resources	Calculator, exemplars, worksheet	Calculator, exemplars, worksheet	Calculator, exemplars, worksheet

Teacher reflection			

LESSON PLAN: 5

Subject: Mathematics Lesson Plan: Rational Numbers Duration: 4h30			Grade 10 Number of Activities 3 Week 5 / Date
Context: Mathematics and Real Life situations			
Link with previous lesson: Rational numbers			
KNOWLEDGE (K): Exponents, SKILLS (S): Calculation, problem solving VALUES (V): appreciation			
	ACTIVITY 1	**ACTIVITY 2**	**ACTIVITY 3**
Activity Content	Exponents	Exponents	Number Patterns
LO,s and AS's	10.1.2	10.1.2	10.1.3
Detail of Activity	Educator facilitates revision by given a worksheet of the Laws of integral exponents. 1. $a^m.a^n = a^{mn}$ 2. $a^m/a^n = a^{m-n}$ 3. $(a^m)^n = a^{m+n}$ 4. $(a.b)^n = a^nb^n$ 5. $(a/b)^n = a^n/b^n$ 6. $a^0 = 1$	Educator provides learners with a worksheet where they use the laws of exponents to simplify expressions. 1. To simplify fractions involving powers with different bases. 2. To simplify expressions by taking out a common factor. 3. Solve simple exponential equations 4. Solve exponential equations by trial and error using a calculator. $2^x = 5$ $2^2=4$ and $2^3 =8$ $4<2^2<8$ show on a number line the solution.	The teacher provides a worksheet to the learners where they investigate number patterns where there is a constant difference between consecutive terms. Learners can then make conjectures. Provide explanations and justifications for them to prove
Teaching Methods	Discussion, investigation, question and answer	Discussion, investigation, question and answer	Discussion, investigation, question and answer
Assessment Strategy :Form : Tool :Method	Class work, homework Memo Peer, self, educator	Class work, homework Memo Peer, self, educator	Class work, homework Memo Peer, self, educator
Expanded Opportunities:	Cartesian plane	Cartesian plane	Cartesian plane
Resources	Calculator, exemplars, worksheet	Calculator, exemplars, worksheet	Calculator, exemplars, worksheet
Teacher reflection			

LESSON PLAN: 6

Subject: Mathematics Lesson Plan: TRIGONOMETRIC FUNCTIONS Duration: 4h30			Grade 10 Number of Activities 3 Week 6&7 / Date
Context: *Engineering, Survey, Architect, Navigation* Mathematics and Real Life situations			
Link with previous lesson:			
KNOWLEDGE (K): , *TRIGONOMETRIC FUNCTIONS* SKILLS (S): Calculation, problem solving VALUES (V): appreciation			
	ACTIVITY 1	**ACTIVITY 2**	**ACTIVITY 3**
Activity Content	Trigonometry functions	Trigonometry functions	Solving triangles
LO,s and AS's	LO3 AS 10.3.5 AS 10.3.6	LO3 AS 10.3.5 AS 10.3.6	LO3 AS 10.3.5 AS 10.3.6
Detail of Activity	Teacher hands out squared papers, worksheet, and mathematical sets to learners while learners do the activity the teacher uses a check list to check on the progress of the learners DISCUSSION; Teacher will need to give a feedback Explain the definitions as you go along the activity. Different tasks can be give to emphasise the definitions.	Educator revise the Theorem of Pythagoras and give learners a worksheet to find the value of trigonometric functions by means of a calculator (rounding off of answers should be mentioned).	Discuss the use of calculator skills and knowledge of trig ratios to solve. Learners solving these triangles means finding the values of unknown sides and angles. Exercises involving the solution of triangles are given to learners.
Teaching Methods	Discussion,	Question and answer	Discussion, question and answer
Assessment Strategy :Form : Tool :Method	Class work, homework Memo Peer, self, educator	Class work, homework Memo Peer, self, educator	Class work, homework Memo Peer, self, educator
Expanded Opportunities:	Find out more about GPS and how it works. When would an ordinary person need to use GPS?		
Resources	Calculator, exemplars, worksheet		
Teacher reflection			

LESSON PLAN: 7

Subject: Mathematics Lesson Plan: Various graphs Duration: 4h30			Grade 10 Number of Activities 3 Week 8 & 9 / Date
Context: Cartesian Plane, Real Life situations			
Link with previous lesson: Relation, ordered number pairs, the Cartesian plane, domain range, straight line graph			
KNOWLEDGE (K): Cartesian Plane, Line graph, Parabola, Hyperbola SKILLS (S): Drawing, interpretation VALUES (V): appreciation			
	ACTIVITY 1	**ACTIVITY 2**	**ACTIVITY 3**
Activity Content	Line Graph	Parabola	Hyperbola
LO,s and AS's	10.2.2	10.2.2	10.2.2
Detail of Activity	Learners given a worksheet where they on graph paper or use table method generate as many graphs as necessary, initially by means of point-by-point plotting, supported by available technology, to make and test conjectures and hence to generalise the effects of the parameters *a* and *q* on the graphs of functions including: y= ax+q	Given $y-= ax^2 + q$ Learners given a worksheet where they on graph paper or use table method generate as many graphs as necessary, initially by means of point-by-point plotting, supported by available technology, to make and test conjectures and hence to generalise the effects of the parameters *a* and *q* on the graphs of functions	y=a/x +q Learners given a worksheet where they on graph paper or use table method generate as many graphs as necessary, initially by means of point-by-point plotting, supported by available technology, to make and test conjectures and hence to generalise the effects of the parameters *a* and *q* on the graphs of functions
Teaching Methods	Discussion, question and answer, discovery		
Assessment Strategy :Form : Tool :Method	Class work, homework Memo Peer, self, educator	Class work, homework Memo Peer, self, educator	Class work, homework Memo Peer, self, educator
Expanded Opportunities:	Drawing of various graphs	Drawing of various graphs	Drawing of various graphs
Resources	Calculator, worksheet	Calculator, exemplars, worksheet	
Teacher reflection			

LESSON PLAN: 8

Subject: Mathematics Lesson Plan: Cartesian Plane, Real Life situations Duration: 4h30			Grade 10 Number of Activities 3 Week 10/ Date
Context: Cartesian Plane, Real Life situations			
Link with previous lesson: Relation, ordered number pairs, the Cartesian plane, domain range, straight line graph, parabola, hyperbola			
KNOWLEDGE (K): Exponential SKILLS (S): Drawing VALUES (V): appreciation			
	ACTIVITY 1	**ACTIVITY 2**	**ACTIVITY 3**
Activity Content	Exponential	Mixed graphs	Mixed graphs
LO,s and AS's	10.2.2	10.2.2	10.2.3
Detail of Activity	Given standard form of exponential graph $y=ab^x+q$ Learners given a worksheet where they on graph paper or use table method generate as many graphs as necessary, initially by means of point-by-point plotting, supported by available technology, to make and test conjectures and hence to generalise the effects of the parameters *a* and *q* on the graphs of functions including: $y= ax+q$	Given $y-= ax^2 + q$ Learners given a worksheet where they on graph paper or use table method generate as many graphs as necessary, initially by means of point-by-point plotting, supported by available technology, to make and test conjectures and hence to generalise the effects of the parameters *a* and *q* on the graphs of functions	Learners will have to identify characteristics of the graphs use applicable characteristics to sketch graphs of functions including (a) domain and range (b) intercepts with the axes (c) turning points, minima and maxima (d) asymptotes (e) shape and symmetry
Teaching Methods	Discussion, question and answer, discovery	Discussion, question and answer, discovery	Discussion, question and answer, discovery
Assessment Strategy :Form : Tool :Method	Class work, homework Memo Peer, self, educator	Class work, homework Memo Peer, self, educator	Class work, homework Memo Peer, self, educator
Expanded Opportunities:	Drawing of various graphs	Drawing of various graphs	Drawing of various graphs
Resources	Calculator, worksheet	Calculator, exemplars, worksheet	Calculator, exemplars, worksheet
Teacher reflection			