MESSAGE TO TEACHERS:

NOTE TO EDUCATORS:

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 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:** Number patterns  
**Grade:** 11  
**Number of Activities:** 3  
**Duration:** 4H 30 Min  
**Week 1-2 / Date:**

### Context
Number patterns

### 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 Content:** Investigating number patterns

**LO.s and AS’s:** 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)

**Teaching Methods:** Discussion, question and answer

### Activity 2

**Activity Content:** Determining general term

**LO.s and AS’s:** 11.1.3 (a), (b)

**Detail of Activity:** 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

**Teaching Methods:** Question and answer

### Activity 3

**Activity Content:** Calculating term value and number of terms

**LO.s and AS’s:** 11.1.3 (a), (b)

**Detail of Activity:** Learners work in 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

### Assessment Strategy: Form Tool Method

**Class work, home work, test Memo Educator, individual**

### Expanded Opportunities:

**Different examples and remedial work**

**Mixed questions and remedial work**

### Resources

**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  
**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

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<td><strong>Activity Content</strong></td>
<td>Non real numbers</td>
<td>Exponents</td>
</tr>
<tr>
<td><strong>LO,s and AS’s</strong></td>
<td>11.1.1</td>
<td>11.1.2a</td>
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| **Detail of Activity** | Teacher gives learners a class work for them to revise rational and irrational numbers from grade 10.  
Introduces numbers of type $\sqrt{2}$, $\sqrt{3}$, $\sqrt{4}$, $\sqrt{16}$ 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 of 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. |

<table>
<thead>
<tr>
<th><strong>Teaching Methods</strong></th>
<th>Discussion, question and answer</th>
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<p>| <strong>Assessment Strategy : Form</strong> | Class work home work | Class work home work | Class work home work |</p>
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<th><strong>: Tool :Method</strong></th>
<th>Memo</th>
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<tr>
<td>Educator, individual, peer,</td>
<td>Educator, individual, peer</td>
<td>Educator, individual, peer</td>
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<tr>
<th><strong>Expanded Opportunities:</strong></th>
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<tr>
<th><strong>Resources</strong></th>
<th>Work sheets, calculator</th>
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</table>
**Subject:** Mathematics  
**Lesson Plan:** Analytical Geometry  
**Grade:** 11  
Number of Activities: 3  
**Duration:** 4H 30 Min x2  
**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  

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<tr>
<td><strong>Activity Content</strong></td>
<td>Revision Analytical geometry</td>
<td>Derive formula: equation of a line through 2 points</td>
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<tr>
<td><strong>LO,s and AS’s</strong></td>
<td>LO3 AS 10.3.3</td>
<td>LO3 AS 11.3.3</td>
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</tbody>
</table>
| **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 | 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  
**Lesson Plan:** Manipulate algebraic expressions  
**Grade:** 11  
**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

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<tr>
<td><strong>Activity Content</strong></td>
<td>Factorization</td>
<td>completing the square</td>
</tr>
<tr>
<td><strong>LO.s and AS's</strong></td>
<td>LO2 AS 11 .2..4</td>
<td>LO2 AS 11 .2..4</td>
</tr>
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</table>
| **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 b²  
2², which is the coefficient of x, halved and squared.  
ax² + 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 ax² + bx +c= 0 by completing a square.  
The roots become  
\[x= \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}\]  
a formula to solve quadratic equation. | Teacher gives a work sheet to the learners to solve for x in ax² + bx +c= 0 by completing a square.  
The roots become  
\[x= \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}\]  
a formula to solve quadratic equation. |

**Teaching Methods:** Question and answer  
**Assessment Strategy:** Class work, home work, Memo, Educator, individual, peer  
**Expanded Opportunities:** Different examples and remedial work
### 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

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<tbody>
<tr>
<td><strong>Activity Content</strong></td>
<td>Revision</td>
<td>Manipulation of algebraic expressions</td>
</tr>
<tr>
<td><strong>LO,s and AS’s</strong></td>
<td>LO 2 AS 10 2.4 a-d</td>
<td>LO 2 AS 11 4 a, b</td>
</tr>
</tbody>
</table>
| **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 Tool : Method** | Worksheet, class work, assignment  
Memo  
Self, peer, group and educator | Worksheet, classwork, assignment  
Memo  
Self, peer, group and educator | Worksheet, classwork, assignment  
Memo  
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  
**Lesson Plan:** Simple and Compound Decay  
**Grade:** Grade 11  
**Number of Activities:** 3  
**Duration:** 4H 30 Min  
**Week:** Week 9  
**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 Content:** Terminology in finance - Simple and compound growth

**LO.s and AS’s:** 10.1.4 and 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

**Teaching Methods:** Discussion, question and answer

**Assessment Strategy:** Form: Tool: Method  
- Class work, worksheet, Memo  
- Peer, self, group, educator

**Expanded Opportunities:** Additional question papers given

**Resources:** Calculator, exemplars,

### ACTIVITY 2

**Activity Content:** Simple and compound growth

**LO.s and AS’s:** 11.1.4

**Detail of Activity:** 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.

**Teaching Methods:** Discussion, question and answer

**Assessment Strategy:** Form: Tool: Method  
- Class work, worksheet, Memo  
- Peer, self, group, educator

**Expanded Opportunities:** Additional question papers given

**Resources:** Calculator, exemplars,

### ACTIVITY 3

**Activity Content:** Simple and compound decay

**LO.s and AS’s:** 11.1.4

**Detail of Activity:** 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

**Assessment Strategy:** Form: Tool: Method  
- Class work, worksheet, Memo  
- Peer, self, group, educator

**Expanded Opportunities:** Additional question papers given

**Resources:** Calculator, exemplars, worksheet
# LESSON PLAN: 7

**Subject:** Mathematics  
**Grade:** 11  
**Lesson Plan:** Time Line to calculate interest  
**Duration:** 4H 30 Min  
**Number of Activities:** 2  
**Context:** Financial matters  
**Link with previous lesson:** Simple and Compound Decay  
**KNOWLEDGE (K):** Time Line to calculate interest  
**SKILLS (S):** Calculation  
**VALUES (V):** appreciation

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<tr>
<td><strong>Activity Content</strong></td>
<td>Time line</td>
</tr>
<tr>
<td><strong>LO,s and AS’s</strong></td>
<td>11.1.4</td>
</tr>
<tr>
<td><strong>Detail of Activity</strong></td>
<td>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 withdrawals are made. e.g. Paul invested R5000 in a bank for a period of 6 years at 6.5% p.a. compounded biannually for the 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.</td>
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<tr>
<td><strong>Teaching Methods</strong></td>
<td>question and answer</td>
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<tr>
<td><strong>Assessment Strategy :Form : Tool :Method</strong></td>
<td>Class work, worksheet, Memo, Peer, self, group, educator</td>
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<tr>
<td><strong>Expanded Opportunities:</strong></td>
<td>Additional question papers given</td>
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<tr>
<td>Resources</td>
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