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 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  
**Grade:** 10  
**Number of Activities:** 3  
**Duration:** 4H 30 Min  
**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 Content:** Revision: Multiplication  
- **LO.s and AS’s:** 10.2.4(a)

#### 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

#### Teaching Methods
- Question and answer, Discussion

#### Assessment Strategy: Form Tool
- Worksheet, class work, assignment  
- Memo, checklist  
- Self, peer, group, educator

#### Expanded Opportunities:
- Sum and difference of two cubes

#### Resources:
- Worksheet,

#### Teacher reflection

### ACTIVITY 2
- **Activity Content:** Factorization of expressions  
- **LO.s and AS’s:** 10.2.4b

#### Detail of Activity
- Learners given worksheet to revise factorization of expressions using the following methods:  
  1. Common factor  
  2. Difference of two squares  
  3. trinomial

#### Teaching Methods
- Question and answer, Discussion, Question and answer, Discussion, Question and answer, Discussion

#### Assessment Strategy: Form Tool
- Worksheet, class work, assignment  
- Memo, checklist  
- Self, peer, group, educator

#### Expanded Opportunities:
- Sum and difference of two cubes

#### Resources:
- Worksheet,

#### Teacher reflection

### ACTIVITY 3
- **Activity Content:** Methods of factorization  
- **LO.s and AS’s:** 10.2.4c

#### Detail of Activity
- 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
- Worksheet, class work, assignment  
- Memo, checklist  
- Self, peer, group, educator

#### Expanded Opportunities:
- Sum and difference of two cubes

#### Resources:
- Worksheet,

#### Teacher reflection
## LESSON PLAN: 2

**Subject:** Mathematics  
**Grade:** 10  
**Lesson Plan:** Factorization, algebraic expressions  
**Number of Activities:** 3  
**Duration:** 4h30  
**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

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<td>10.2.4 a,b, c</td>
<td>10.2.4d</td>
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| **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, Discussion, Question and answer, Discussion, Question and answer, Discussion

**Assessment Strategy:**  
**Form:** Class work, homework, discussion, investigation  
**Tool:** Memo, checklist, rubric, Peer, self, group, educator  
**Method:** Class work, homework, discussion, investigation  
**Expanded Opportunities:** Division of algebraic expressions and solve equations that cannot factorize
## LESSON PLAN: 3

**Subject:** Mathematics  
**Lesson Plan:** Volume and surface area  
**Duration:** 4H30  
**Grade:** 10  
**Number of Activities:** 3  
**Week:** 3 / **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

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<td>Surface area</td>
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<td>LO3 AS 10.3.1</td>
<td>LO3 AS 10.3.1</td>
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</table>
| **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

### Assessment Strategy
Class work, homework, discussion, investigation

### Expanded Opportunities:
Transformation

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**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 Content:** Rational Numbers  
**LO,s and AS’s:** 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.

**Teaching Methods:** Question and answer, Discussion.

**Assessment Strategy:** Worksheet, class work, Memo, checklist.

**Expanded Opportunities:** Mixed questions, Venn diagrams.

**Resources:** Calculator, exemplars, worksheet.

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### ACTIVITY 2

**Activity Content:** Rational Numbers  
**LO,s and AS’s:** 10.1.1

**Detail of Activity:** 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.

**Teaching Methods:** Question and answer, Discussion.

**Assessment Strategy:** Worksheet, class work, Memo, checklist.

**Expanded Opportunities:**  

**Resources:** Calculator, exemplars, worksheet.

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### ACTIVITY 3

**Activity Content:** Rational Numbers  
**LO,s and AS’s:** 10.1.1

**Detail of Activity:** The educator introduces the learners and give worksheets to the set builder notation and interval notation using number lines.  

**Teaching Methods:** Question and answer, Discussion.

**Assessment Strategy:** Worksheet, class work, Memo, checklist.

**Expanded Opportunities:**  

**Resources:** Calculator, exemplars, worksheet.
# LESSON PLAN: 5

**Subject:** Mathematics  
**Lesson Plan:** Rational Numbers  
**Grade:** 10  
**Number of Activities:** 3  
**Duration:** 4h30  
**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  

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<td>Exponents</td>
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<tr>
<td><strong>LO,s and AS’s</strong></td>
<td>10.1.2</td>
<td>10.1.2</td>
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| **Detail of Activity** | Educator facilitates revision by given a worksheet of the Laws of integral exponents.  
1. \( a^m \cdot a^n = a^{m+n} \)  
2. \( a^m / a^n = a^{m-n} \)  
3. \( (a^m)^n = a^{mn} \)  
4. \( (a \cdot b)^n = a^n b^n \)  
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.  
5. \( 2^x = 5 \)  
6. \( 2^2 = 4 \) and \( 2^3 = 8 \)  
7. \( 4 < 2^2 < 8 \) 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. |

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<tr>
<th><strong>Teaching Methods</strong></th>
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<th>Discussion, investigation, question and answer</th>
<th>Discussion, investigation, question and answer</th>
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<td><strong>Assessment Strategy :Form :Tool :Method</strong></td>
<td>Class work, homework Memo Peer, self, educator</td>
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<td><strong>Expanded Opportunities:</strong></td>
<td>Cartesian plane</td>
<td>Cartesian plane</td>
<td>Cartesian plane</td>
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<td><strong>Resources</strong></td>
<td>Calculator, exemplars, worksheet</td>
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**Teacher reflection**
**Subject: Mathematics**  
**Lesson Plan: TRIGONOMETRIC FUNCTIONS**  
**Grade 10**  
**Number of Activities: 3**  
**Duration: 4h30**  
**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**

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<td>LO3 AS 10.3.5 AS 10.3.6</td>
<td>LO3 AS 10.3.5 AS 10.3.6</td>
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</table>
| 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  
**Grade:** 10  
**Lesson Plan:** Various graphs  
**Number of Activities:** 3  
**Duration:** 4h30  
**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

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<tr>
<td><strong>LO,s and AS’s</strong></td>
<td>10.2.2</td>
<td>10.2.2</td>
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<tr>
<td><strong>Detail of Activity</strong></td>
<td>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: $y= ax+q$</td>
<td>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</td>
</tr>
</tbody>
</table>

**Teaching Methods:** Discussion, question and answer, discovery  
**Assessment Strategy:** Form Tool : Method  
- Class work, homework  
- Memo  
- Peer, self, educator  
- Peer, self, educator  
- Peer, self, educator

**Expanded Opportunities:** Drawing of various graphs  
**Resources:** Calculator, worksheet  
**Teacher reflection**
### LESSON PLAN: 8

**Subject:** Mathematics  
**Grade:** 10  
**Lesson Plan:** Cartesian Plane, Real Life situations  
**Number of Activities:** 3  
**Duration:** 4h30  
**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

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<td>10.2.2</td>
<td>10.2.2</td>
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| **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:**  
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**