basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

Curriculum and Assessment Policy Statement: Technical Occupational

Year 1- 4

MECHANICAL TECHNOLOGY:

MOTOR MECHANICS

CONTENT

SECTION 1:

INTRODUCTION TO THE CURRICULUM AND ASSESSMENT POLICY STATEMENT: TECHNICAL OCCUPATIONAL

1.1 Background

The South African Constitution, Act 108 of 1996, enshrines the right of every child to access quality basic education without there being any form of discrimination. There are learners participating in the General Education and Training Band who have an interest and talent in applied knowledge and in technical and vocational skills subjects which are currently not available in the National Curriculum Statement, Grades R to 12 (2011). This cohort of learners should be given an opportunity to achieve a formal qualification or recognition of achievement towards a qualification that is related to any vocational and occupational learning within their area of interest and aptitude.

This Subject Statement has been developed to respond more effectively to the needs of these learners who have been identified and assessed through the protocols approved by the Department of Basic Education and who will benefit from curriculum content that is aligned to the Senior Phase of the National Curriculum Statement at a more applied and functional level in accordance with their interest and aptitude.

It is critical, that through differentiated methodologies, the learners enrolled for this qualification will be able to progress with regard to applied competencies, even where they might not be able to attain the minimum theoretical requirements of the respective grades of the senior phase. There should always be high expectations for all learners and the necessary scaffolding and learning support to master foundational competencies (language and numeracy) relevant to the specific subject, so that they are in a position to demonstrate the practical competencies that they have mastered which will make it possible for them to progress to further education and training pathways.

The learning programme will be structured in such a way that it would adequately prepare learners to progress onto the academic, technical vocational or technical occupational pathways of the Further Education and Training Band, albeit with endorsement. It will also enable learners across the range of competencies and aptitudes to obtain a recognised and accredited qualification or certificate of attainment.

The programme aims at contributing to the ideal of education to produce learners who will function **meaningfully** and **effectively** in the society, be able to enter future **careers** and be equipped to meet the requirements of the **economy** (local and global).

1.2 Overview

Through the policy document the Minister of Basic Education will be able to prescribe the minimum norms and standards for technical occupational education in the General Education and Training band.

The following legal framework will be adhered to:

(i) National Curriculum Statement, Grades R to 12 (2011) together with the National Protocol for Assessment and the National Policy pertaining to the Programme and Promotion Requirements of the National Curriculum Statement, Grades R to 12;

(ii) Draft Technical Vocational Subject Statements listed in the Draft General Certificate of Education: Technical Occupational, a Qualification at Level 1 on the National Qualification Framework;

(iii) General and Further Education and Training Quality Assurance Act, 2001 (Act No.58 of 2001); the General and Further Education and Training Amendment Act, 2008 (Act No 50 of 2008); the NQF Act, 2008 (Act no 67 of 2008) and the Continuing Education and Training Act, 2006 as amended by Act No 3 of 2012 and Act No 1 of 2013;

(iv) The General and Further Education and Training Qualifications Sub- Framework (August 2013);

(v) Standards and quality assurance for General and Further Education and Training (June 2008, Revised April 2013);

(vi) Policy and regulations pertaining to the conduct, administration and management of assessment for the General Education and Training Certificate in Skills and Vocational Training: A qualification at Level 1 on the National Qualification Framework (NQF);

(vii) Education White Paper 6 on Special Needs Education: Building an Inclusive Education and Training System (2001);

(viii) The United Nations Convention on the Rights of Persons with Disabilities adopted by the United Nations General Assembly on 13 December 2006 and ratified by the South African parliament on 5 June 2007;

(ix) The White Paper on the Rights of Persons with Disabilities, 2015;

(x) Section 11 of the Children's Act (2007);

(xi) Chapter 5, section 76 of the Children's Act as amended (2007);

(xii) Umalusi's Quality Assurance of Assessment: Directives, Guidelines and Requirements;

(xiii) Skills Development Act, 1998 (Act 97 of 1998); and

(xiv) Assessment Policy for Qualifications and Part Qualifications on the Occupational Qualifications Sub-Framework (OQSF), 2014 of the QCTO.

1.3. General Aims of the Technical Occupational Curriculum

(a) The National Curriculum Statement, Grades R to 9 gives expression to the knowledge, skills and values worth learning in South African schools. The Technical Occupational Curriculum aims to ensure that learners, irrespective of their abilities, have the opportunity to develop competences for meeting challenges and taking up opportunities in the fast changing 21st century and are also guided to apply knowledge and skills in ways that are meaningful to their own lives. In this regard, the curriculum promotes knowledge in local contexts, while being sensitive to global imperatives, including the demands of the fourth industrial revolution. Sustaining development-relevance in the face of constant and rapid change requires curricula to be lifelong learning systems in their own right, capable of constant self-renewal and innovation.

(b) The curriculum serves the purposes of:

- Equipping learners, irrespective of their socio-economic background, race, gender, physical ability or intellectual ability, with the knowledge, skills and values necessary for self-fulfilment, and meaningful participation in society as citizens of a free country;
- Promoting critical thinking, creativity and innovation, communication, collaboration, information, media and ICT literacies, flexibility and adaptability, initiative and self-direction, social and cross-cultural, productivity and accountability, leadership and responsibility and life-long learning;
- Facilitating the transition of learners from education institutions to the workplace;
- Providing employers with a sufficient profile of a learner's competences.
- Being sensitive to issues of diversity such as poverty, inequality, race, gender, language, age, and other factors;
- Valuing indigenous knowledge systems: acknowledging the rich history and heritage of this country as important contributors to nurturing the values contained in the Constitution; and
- Credibility, quality and efficiency: providing an education that is comparable in quality, breadth and depth to those of other countries.

(c) The curriculum is based on the following principles:

- Social transformation: ensuring that the educational imbalances of the past are redressed, and that equal educational opportunities are provided for all sections of the population;
- Active and critical learning: encouraging an active and critical approach to learning, rather than rote and uncritical learning of given truths;
- High knowledge and high skills: the minimum standards of knowledge and skills to be achieved at each grade are specified and set high, achievable standards in all subjects;

- Progression: content and context of each grade shows progression from simple to complex; and
- Human rights, inclusivity, environmental, gender and social justice and equality: infusing the principles and practices of social justice and human rights as defined in the Constitution of the Republic of South Africa as well as the greening of the economy.

(d) Inclusivity should become a central part of the organisation, planning and teaching at each school. This can only happen if all teachers have a sound understanding of how to recognise and address barriers to learning, and how to plan for diversity. The key to managing inclusivity is ensuring that barriers are identified and addressed by all the relevant support structures within the school community, including teachers, District-Based Support Teams, School-based Support Teams, parents and Special Schools as Resource Centres. To address barriers in the classroom, teachers should use various curriculum differentiation strategies such as those included in the Department of Basic Education's Guidelines for Responding to Learner Diversity in the Classroom (2011), as well as the Standard Operating Procedures for Accommodations in Assessment (2016).

1.3.1. The aims of the General Certificate of Education: Technical Occupational

The specific aims of the qualification are to:

- Give recognition to learners who would meet the requirements and achieve the competencies as specified in the Exit Level Outcomes and associated Assessment Criteria as set out in the GFETQSF along differentiated pathways;
- Provide a foundation of quality, standardised general education which will suit the needs of these learners and help prepare them for life after school and enable them to access particular employment or occupational workplace-based learning. It may also enable the learners to access a vocational qualification at a Technical and Vocational Education Training College;
- Promote Lifelong learning to enable learners to continue with further learning and skills development in the workplace;
- Prepare learners to function better in a fully inclusive society and workplace; and
- Provide employers with a profile of the learner's competence.

Learners successfully completing the qualification will be able to:

- Identify, select, understand and apply knowledge to the intended purpose and identify solutions to problems in the field of study;

- Demonstrate the necessary applied knowledge and skills identified for competence in a subject, as specified in the subject statement;
- Demonstrate knowledge and skills gained for purpose of formal communication and basic numerical operations;
- Have the ability to apply knowledge and skills in changing contexts;
- Reflect on their learning in order to promote an interest in learning and further study; and
- Demonstrate basic entrepreneurial skills that will enable them to create their own work and business opportunities in the contexts in which they live.

1.4. Subjects and Time Allocation

Instructional Time for the Technical Occupational Learning Programmes is 27½ hours in a five-day cycle

<table>
<tr><th colspan="3">Subjects

General Education</th><th colspan="2">Time</th></tr>
<tr><td colspan="3">Languages

(Home Language and First Additional Language)</td><td colspan="2">3 Hours for Home Language</td></tr>
<tr><td colspan="3">All 11 official languages (Afrikaans, English, isiNdebele, isiXhosa, isiZulu, Siswati, Sesotho, Setswana, Sepedi, Tshivenda, Xitsonga)</td><td colspan="2">2 hours for First Additional Language</td></tr>
<tr><td colspan="3">Mathematics</td><td colspan="2">3 hours</td></tr>
<tr><td rowspan="4">Life Skills</td><td>Personal and Social Well-being

(including aspects of Life Orientation, Social Sciences and Economic and Management Sciences)</td><td>2½ hours</td><td rowspan="4">6 hours</td></tr>
<tr><td>Physical Education</td><td>1 hour</td></tr>
<tr><td>Creative Arts</td><td>1 hour</td></tr>
<tr><td>Natural Sciences</td><td>1½ hours from year 2 onwards

This time to be used in year 1 to support Languages and Mathematics</td></tr>
<tr><td colspan="5">Information Communication Technology

ICT is a compulsory subject for all learners. It can be offered either as a stand-alone or integrated across various subjects. If offered as a stand-alone a school may use time allocated to the Technical Occupational programme. ICT does not count towards the qualification but is a necessary life-long skill. ICT is not to be confused with the Technical Occupational Subject “Office Administration” which is an elective.</td></tr>
</table>

Subjects **Technical Occupational: Electives**	**Time**
Agricultural Studies Art and Crafts Civil Technology: Bricklaying and Plastering Civil Technology: Plumbing Civil Technology: Woodworking and Timber Consumer Studies: Food Production Consumer Studies: Sewing Early Childhood Development Electrical Technology: Electrical Hospitality Studies Mechanical Technology: Body Works: Panel Beating and or Spray Painting Mechanical Technology: Motor Mechanics Mechanical Technology: Sheet Metal Work Mechanical Technology: Welding Mechanical Technology: Maintenance Office Administration Personal Care: Ancillary Health Care Personal Care: Beauty and Nail Technology Personal Care: Hairdressing Service Technology: Upholstery Wholesale and Retail	13½ hours
Total: General and Occupational	27½

The table below proposes the learner progression across the years at a School of Skills.

Year 1 Minimum of 1 year of orientation	**Year 2**	**Year 3**	**Year 4**
Base Line Assessment for Language and Mathematics ➢ **Intervention (ISP)** **General Education:** • **Home Language** • **FAL** • **Mathematics** • **Life Skills:** ✓ Personal Social Wellbeing ✓ Physical Education ✓ Creative Arts ➢ ICT Enrichment **Technical Occupational** **Minimum 2 x SKILLS** **Across the year** **Post Assessment** • **Analyse results** Progress to Year 2 with appropriate support for Languages and Mathematics	**General Education:** • **Home Language** • **FAL** • **Mathematics** • **Life Skills:** ✓ Personal Social Wellbeing ✓ Physical Education ✓ Creative Arts ✓ Natural Sciences ➢ ICT Enrichment **Technical Occupational** **Minimum of 1 Skill**	**General Education:** • **Home Language** • **FAL** • **Mathematics** • **Life Skills:** ✓ Personal Social Wellbeing ✓ Physical Education ✓ Creative Arts ✓ Natural Sciences ➢ ICT Enrichment **Technical Occupational** **Minimum of 1 Skill**	**General Education:** • **Home Language** • **FAL** • **Mathematics** • **Life Skills:** ✓ Personal Social Wellbeing ✓ Physical Education ✓ Creative Arts ✓ Natural Sciences ➢ ICT Enrichment **Technical Occupational** **Minimum of 1 Skill** GCE: TO Qualification Or Certificate of Achievement (External exam- results verified / moderated)

Note:

Year One is an orientation year and learners must be exposed to a minimum of two occupational skills so that they can select a skill with which they will continue from Year Two. Schools that offer more than the minimum two skills in Year One may adapt the Annual Teaching Plan for Year One to accommodate their rotation system to expose learners to more skills e.g. schools may offer a skill per term for Terms 1, 2 and 3 and learners then select the skill they will specialise in and start it in Term 4. It is important that learners in Year One experience the core competencies of the skills so that an informed choice can be made.

Years Two, Three and Four are the critical years for learners. It is important that learners are exposed to all the Topics and Specific Aims per selected Occupational skill, acknowledging that not all learners will be successful in all of these.

SECTION 2

INTRODUCTION TO MECHANICAL TECHNOLOGY: MOTOR MECHANICS

2.1 What is Motor Mechanics?

Motor mechanics introduces students to the fundamentals of vehicle technology and equips them with the necessary confidence to perform basic tasks related to, for example, vehicle components, engines, gearboxes, fuel systems, body components and electronic systems. The tasks are limited to removal, cleaning, servicing (replenishing of fluid) and fitting.

2.2 Topics to be studied in Motor mechanics.

1. Safety
2. Hand tools
3. First Aid: HIV / AIDS
4. Measuring equipment
5. Power tools
6. Vehicle lifting equipment
7. Automotive batteries
8. Lubrication
9. Engine technology
10. Automotive components
11. Mechanical components
12. Servicing
13. Inspection and lubrication
14. Basic hydraulic components
15. Basic welding / joining of metals

2.3 Specific Aims:

The learner is able to:

1. Demonstrate safety practise in the workshop
2. Use and care for hand tools
3. Understand and deal with First Aid in the context of HIV / AIDS
4. Use and care for measuring equipment
5. Use and care for power tools
6. Use vehicle lifting equipment
7. Identify and maintain automotive batteries
8. Lubrication vehicle components
9. Explain fundamental engine technology
10. Remove and fit automotive components
11. Assemble mechanical components
12. Carry out an automotive service

13. Inspect and lubricate a vehicle
14. Identify and repair basic hydraulic components
15. Use basic welding / joining of metal to repair components

2.4 Requirements for Motor Mechanics as a subject

2.4.1 Time Allocation

The total number of hours allocated for the subject in a five-day cycle is 13 ½ hours. Sufficient time must be allocated in the school timetable for the practical work required to be done.

2.4.2 Resources

Human resources

Motor mechanics requires a trained subject specialist. It is preferred that the teacher offering Motor Mechanics is an artisan / technician / technical teacher in a Motor Trade related area. Industry related experience and workshop management skills are essential and a tertiary qualification in technical teaching is preferred.

The Motor Mechanic teachers are required to:

- Teach the subject content with confidence and flair
- Interact with learners in a relaxed but firm manner
- Manage the workshop resourcing, budget and safety
- Manage the teaching environment
- Conduct stock taking and inventory
- Plan for practical work
- Plan for theory lessons
- Conduct weekly practical sessions
- Maintain and service the workshop as a whole
- Maintain and service the tools and instruments
- Ensure learner safety
- Produce working PAT projects in cooperation with learners
- Carry out School Based Assessment (SBA)
- Implement innovative methods to keep the subject interesting
- Be self - motivated to keep her/him abreast of the latest technological developments
- Regularly attend skills workshops

Learner Resources:

- Text/ resource books
- Workbook
- An overall and safety shoes

Classroom Resources

- Desk and chair for each learner
- Posters / diagrams
- Models
- Writing board
- Projection device (if possible not inadmissible)
- Computer with internet connection (if possible not inadmissible)

2.4.3 Infrastructure, equipment and finances

Schools must ensure that teachers have the necessary infra-structure, equipment and financial resources for quality teaching and learning.

Infrastructure

- Motor Mechanics cannot be implemented in a school without an equipped workshop.
- Electricity supply to the workshop is crucial, preferably three phase, four-wire supply, but at least single phase with a high current circuit breaker.
- Lighting and ventilation is of extreme importance and a workshop should ideally have multiple exits with doors that open outward.
- Tools and equipment should have sufficient storage and a well-developed storage management system with an up to date inventory. Shelves should be clearly marked and storage areas defined.
- Good housekeeping principles require that all workshops be cleaned regularly. A suitable waste removal system should be in place to accommodate waste. The requirements of the Occupational Health and Safety (OHS) Act 85 of 1993 need to be complied with at all times.
- Machinery on stands should be permanently affixed to the floor, with isolation switches for the mains supply. All machines should have working machine guards.
- Electrical motors should ideally be painted bright orange. Specification plates should be clearly legible.
- The workshop must have a lockable mains distribution board. The workshop must be fitted with an emergency cut of switch/s which is/are easily accessible at all times.
- Safety rules must be displayed on posters in the workshop.

Equipment

The following is the minimum requirements for a Motor Mechanics workshop:

- battery charger — 1 per class 12V+ 24V
- battery cut away model — 2 per class
- bearings — 1 of each type per class
- compression tester — 2 per class
- compressor — 1 per class
- drip feed lubricator — 1 per class
- engine models — 1 for every 4 learners minimum
- feeler gauge — 2 per class

- fender cover — 2 sets per class
- fluids — 1 of each type per class
- grease gun — 1 per class
- hydrometer — 2 per class
- jumper cables — 1 set per class
- lift and trolley jack — 1 per class
- load tester — 1 per class
- lubricants — 5L of each type per class
- measuring tape — 2 per class
- multi-meter — 2 per class
- safety glasses — 4 pairs per workshop
- toolboxes — 2 per class (1 with every engine)
- thermometer — 2 per class
- torque wrench — 2 of every size per class
- tyre pressure gauge — 1 per class
- vernier callipers — 4 per class
- welding equipment — 2 per workshop

Finances:

Budget and inventory

A budget must be allocated for the subject. The amount will be determined by the number of learners taking the subject across all the years and the nature of the practical work required as stipulated in the curriculum. The budget needs to be revised annually and must consider all resources needed per year. The funding must make provision for maintenance of equipment and the replacement over the years.

Resourcing could be sub divided into the following categories:

- Safety Equipment
- Tools and Equipment
- Consumable Materials
- Practical Assessment Task Resources (PAT
- Teaching and Learning Support Material
- Maintenance

A stock inventory must be maintained by the teacher and verified annually by a Senior Management Team member.

2.5 Career opportunities

Career and occupational opportunities for learners with a foundation in Motor Mechanics include but is not limited to:

- work in the motor industry
- self-employment
- an assistant to a mechanic

SECTION 3

OVERVIEW OF TOPICS PER TERM AND ANNUAL TEACHING PLANS

3.1 Content overview per Year

TOPIC	Year 1	Year 2	Year 3	Year 4
1. Safety in the workshop	Purpose of safety. Fire- fighting.	Purpose of demarcated areas, emergency stops and first aid stations	Personal safety equipment and performing housekeeping duties	Identify and respond to unsafe or potentially unsafe conditions or acts
2. Use and care of hand tools	Identify hand tools, and their uses	Select and use hand tools	Care and maintenance of hand tools	Work safely with due care for self, fellow worker and equipment
3. First Aid- Understand and deal with HIV / AIDS	Explain what HIV/AIDS is, and how to deal with it	Explain the rights and responsibilities of workers with HIV/AIDS	**NOT DONE**	**NOT DONE**
4. Use and care of measuring equipment	Discuss basic units of measurement and symbols	Selecting and use of measuring equipment	Care and maintenance of measuring equipment	Recognise and report wear or damage to measuring equipment
5. Use and care of power tools	Select and use power tools	Care and maintenance of power tools	Power supply and connection to equipment	Recognise and report any damage to any power tool
6. Use of vehicle lifting equipment	Discuss operation, functions and components of the hoist	Carry out precautionary measures before operating a hoist	**NOT DONE**	**NOT DONE**

7. Automotive batteries	Remove and fit an automotive battery	Test batteries	Service batteries	Remove and replace battery terminals and cables
8. Lubrication	Demonstrate knowledge of lubrication	Lubricate machines and equipment	Correct handling of lubricants	Correct storage of lubricants
9. Fundamentals engine technology	Identify types of engines	Identify, and study the function of engine parts	Engine designs	Function of engine systems
10. Removing and fitting automotive components	**NOT DONE**	**NOT DONE**	Preparation for removal of parts. Remove parts	Inspect and test fitted part
11. Assemble mechanical components	**NOT DONE**	**NOT DONE**	Assembly methods	Plan assembly. Do the assembly
12. Carry out an automotive service	**NOT DONE**	Plan and prepare for servicing a vehicle	Perform the service	Apply quality checks on completed service
13. Inspection and lubrication	**NOT DONE**	Plan and prepare to inspect and lubricate vehicle	Drain, refill or top up fluids and lubricants	Inspect for leaks and defects
14. Basic hydraulic components	**NOT DONE**	**NOT DONE**	Basic knowledge of hydraulic components and their application	Safety aspects related to hydraulic systems
15. Basic welding / joining of metals	**NOT DONE**	**NOT DONE**	Prepare for work activity Weld/join metals	Perform finishing activities

3.2 CONTENT OUTLINE PER TERM

Year 1

WEEK	TOPIC	CONTENT The learner is able to:	Techniques, activities, resources and process notes
1	**OHS**	<u>General Safety:</u> Occupational Health and Safety •	• Verbal discussion of what Occupational Health and Safety is. • Discuss what the law requires and why. • Discuss the consequences of an unsafe or healthy workplace regarding employee and employer. • Use posters as a continuous reminder in the work place. • Use posters and digital media to show the importance of a healthy and safe working environment.

1-- 2	Keep the work area safe and productive	<u>Specific Safety:</u>
		• Discuss and explain the purpose of safety equipment and procedures
		  • Use personal protective equipment (shoes; overalls; safety glasses; dust mask; ear protection)
		  • Perform housekeeping duties in work area
		  • Identify and explain the purpose of demarcated areas, emergency stops, exits and first aid stations
		  • Identify and respond to unsafe or potentially unsafe conditions, incidents or acts that may occur.
		  • Use of fire-fighting equipment (fire extinguishers; fire hoses)
			• Verbal discussion of the reasons for safety measures in the workshop.
			• Discuss types of fires.
			• Demonstrate how fire equipment works.
			• Use posters to reinforce safety measures.
			• Use posters and or digital media to show the importance of personal safety.
			• Show practical examples of unsafe acts or conditions that must be identified in the workshop.

	First Aid - Understand and deal with HIV/AIDS	• Understand how to manage HIV and AIDS in an event of an accident. • Basic First Aid incident management	• Identify and discuss how to handle a person with HIV/AIDS during an accident or injury. • Discuss the rights of the employees in regard to HIV/AIDS in the workplace. • Use poster, slide show or video

3 - 8	Select and use power and hand tools	• Work safely with due care for self, fellow workers, equipment, materials and environment.
		• Select and use hand tools
		  • Identify all the hand tools and explain their uses e.g. spanners; sockets; ratchet; extensions; pliers; screwdrivers: hammers
		  • Care for and maintain hand tools
			• Test prior knowledge of hand tools, show actual tool, let learner handle the actual tool, ask learner to name the tools, give the correct name.
			• Demonstrate how a tool should be used correctly, using actual tool.
			• Demonstrate how to care for hand tools.
			• Text books can be used.
			• Pictures and video can be used

	Select, use and care for power tools	• Use and care for power tools
		  • Care for and maintain power tools
		  • Clean and store tools
		  • Check on power supply tools connections to equipment
		  • Identify the unsafe/faulty power tools and take corrective action.
		  • Identify safe working practices including the use of appropriate personal protective equipment.
		  • Identify safety hazards including bad connections, damaged air and hydraulic hoses, damaged electrical cables, cracked discs and worn or damaged blades.
			• Discuss safety when using any power tool
			• Discuss personal safety when using power tools.
			• Discuss safety of workers around you when using a power tool.
			• Test prior knowledge by asking learners to name the shown tool, and for what they are used.
			• Discuss care for power tools.
			• Show learners, the actual tools.
			• Now demonstrate how to use the tools.
			• Now assist learner in using a certain tool where necessary.
			• Now let the learner use the tool by himself.
			• Use the actual tool, posters and video to enhance the lessons.

	Select, use and care for measuring equipment	• Explain and discuss basic units of measurement and symbols e.g. millimetre (mm)
		  • Select and use measuring instruments e.g. measuring tape and steel ruler
		  • Care for and maintain measuring instruments
		  • Recognise and report problems with measuring instruments.
			• Discuss types of basic measurement units, where each is used and each ones symbol.
			• Use posters and digital media.
			• Show learner, the actual instrument and let them handle it.
			• Now demonstrate how to use the actual Instrument. Assist learners in using the measuring instrument themselves
			• Let learner use the measuring instrument tool himself.
			• Discuss care and maintain of measuring instrument equipment.

9 – 10	Formal Assessment	The weeks allocated for formal assessment are integrated across the weeks planned for teaching and learning. The assessment will consist of Practical Task/s with a 75% weighting and a Theory test with a 25% weighting.
Activity 1: Demonstration 25% **Activity 2**: Practical 50% **Activity 3** Test Respond to questions Pen and paper (Oral or written) 25%		

Year 2 Term 1

WEEK	TOPIC	CONTENT **The learner is able to:**	Techniques, activities, resources and process notes

1-- 2	Keep the work area safe and productive	<u>Specific Safety:</u>
		• Discuss and explain the purpose of safety equipment and procedures
		  • Perform housekeeping duties in work area
		  • Use personal protective equipment (shoes; overalls; safety glasses; dust mask; ear protection)
		  • Identify and explain the purpose of demarcated areas, emergency stops, exits and first aid stations
		  • Identify and respond to unsafe or potentially unsafe conditions, incidents or acts that may occur.
		  • The uses of fire-fighting equipment (fire extinguishers; fire hoses)
			• Verbal discussion of the reasons for safety measures in the workshop.
			• Discuss types of fires.
			• Demonstrate how fire equipment works.
			• Use posters to reinforce safety measures.
			• Use posters and or digital media to show the importance of personal safety.
			• Show practical examples of unsafe acts or conditions that must be identified in the workshop.

	First Aid- Understand and deal with HIV/AIDS	• Understand how to manage HIV and AIDS in an event of an accident. • Basic First Aid incident management	• Identify and discuss how to handle a person with HIV/AIDS during an accident or injury. • "Explain the rights and responsibilities of employees in the workplace with regard to HIV / AIDS" • Use poster, slide show or video

3 - 8	Select and use hand tools.	• Work safely with due care for self, fellow workers, equipment, materials and environment.
		• Select and use hand tools
		  • Identify all the hand tools and explain their uses e.g. spanners; sockets; ratchet; extensions; pliers; screwdrivers: hammers
		  • Care for and maintain hand tools
			• Test prior knowledge of hand tools, show actual tool, let learner handle the actual tool, ask learner to name the tools, give the correct name.
			• Demonstrate how a tool should be used correctly, using actual tool.
			• Demonstrate how to care for hand tools.
			• Text books can be used.
			• Pictures and video can be used

	Select, use and care for power tools	• Use and care for power tools
		  • Care for and maintain power tools
		  • Clean and store tools
		  • Check on power supply tools connections to equipment
		  • Identify the unsafe/faulty power tools and take corrective action.
		  • Identify safe working practices including the use of appropriate personal protective equipment.
		  Identify safety hazards including bad connections, damaged air and hydraulic hoses, damaged electrical cables, cracked discs and worn or damaged blades.
			• Discuss safety when using any power tool
			• Discuss personal safety when using a power tools.
			• Discuss safety of workers around you when using a power tool.
			• Test prior knowledge by asking learners to name the shown tool, and for what they are used.
			• Discuss care for power tools.
			• Show learners, the actual tools.
			• Now demonstrate how to use the tools
			• Now assist learner in using a certain tool where necessary.
			• Now let the learner use the tool by himself.
			• Use the actual tool, posters and video to enhance the lessons.

	Select, use and care for measuring equipment	• Explain and discuss basic units of measurement and symbols e.g. millimetre (mm)
		  • Select and use measuring instruments e.g. measuring tape and steel ruler
		  • Care for and maintain measuring instruments
		  • Recognise and report problems with measuring instruments.
			• Discuss types of basic measurement units, where each is used and each ones symbol.
			• Use posters and digital media.
			• Show learner the actual instrument, let them handle it.
			• Now demonstrate how to use the actual Instrument. Assist learners in using the measuring instrument themselves
			• Let learner use the measuring instrument tool himself.
			• Discuss care and maintain of measuring instrument equipment.
			• Asses learner on accurate measuring ability using a measuring tape or a steel ruler.

9 – 10	Formal Assessment	The weeks allocated for formal assessment are integrated across the weeks planned for teaching and learning. The assessment will consist of Practical Task/s with a 75% weighting and a Theory test with a 25% weighting.	
Activity 1: Demonstration 25% **Activity 2**: Practical 50% **Activity 3** Test Respond to questions Pen and paper (Oral or written) 25%			

Year 2 Term 2

WEEK	TOPIC	CONTENT **The learner is able to:**	Techniques, activities, resources and process notes
1	Select and use vehicle lifting equipment	• Discuss the basic operation of automobile lifting equipment and creepers • Identify and explain the function of various components related to hoists, • Discuss the basic operation of a; hoist, jack and creepers • Identify and explain the components including electronic motor, support posts, control mechanism, platform, slopping plates and safety mechanism • Explain the precautionary measures including loading in accordance to hoist specifications, hoist in a safe working condition, area is clear, vehicle correctly positioned on hoist. • Carry out precautionary measures before operating a hoist. • Choose a vehicle, now let check the weight and width of the vehicle to see if it will fit on the hoist and if the hoist will be capable to lift the vehicle safely. • Move vehicle onto the hoist, indicate the correct position, approach speed and placement.	• Test prior knowledge of automobile lifting equipment, show actual equipment; ask learner to name and use the equipment • Demonstrate how the equipment should be used correctly, using actual equipment in the work place. • Verbal discussion on the uses of uses of lifting equipment. • Hands on identification of components. • Verbal discussion of safety when using lifting equipment. • Verbal explanation of the correct use of lifting equipment • Verbal test can be used with a check list, to document results. • Formal pen and paper exam can also be used

2-3	Service automobile batteries	• Remove and fit an automotive battery. • Explain uses of and different batteries in terms of manufacturer specifications. • Use personal protective equipment as in handling batteries. • Identify and use relevant equipment to protect the vehicle when removing and fitting batteries. • Secure batteries in accordance with manufacturer specifications. • Check the battery for safety and condition prior to removal. • Remove and fit batteries according to the specified procedures in terms of costs, durability and safety.	• Discuss verbally the condition of the battery, and what the signs of damage are. Pictures or examples of damaged batteries can be shown. • Explain why, and what protective equipment should be used when removing a battery or replacing it. • A verbal or pen and paper test can follow • Practical work forms part of theory as stipulated in text book.
		• Test batteries. • Test batteries in terms of manufacturer warranty and reliability. • Conduct the test in accordance with workplace procedures and manufacturers recommendations. • Use tools and test equipment in accordance with workshop procedures. • Interpret test results to determine the status of the battery.	• Show learner on an actual defective battery how the test should be done. • Now show learner how the test is performed on a working battery, and what the results should be. • Now let the learner perform the test himself/herself, evaluate results. • Discuss different types of tests, what each test is used for.

		• Service batteries.
		  • Check the state of charge of the battery and confirm it to be in accordance with the manufacturer specifications.
		  • Charge the battery in accordance with the workplace and manufacturer requirements.
		  • Explain reason for charging a battery in terms of battery life and durability.
		  • Explain the operation of a battery in terms of the process of converting chemical energy into electrical energy.
		  • Clean batteries in accordance with workplace procedures and manufacturers specifications.
		  • Explain methods for working with solvents and acids in accordance with relevant health and safety procedures and legislation.
		  • Explain consequences of not working safely in terms of potential injury to personnel and damage to equipment
			• Demonstrate how to check a battery for its state of charge using a multi-meter, or a hydrometer.
			• Now let the learner perform the test himself / herself.
			• Discus verbally how a battery should be charged to extend I t's life.
			• Discuss the construction and inner workings of a battery. Use pictures, or models.
			• Use pictures, or a cutaway model.
			• Discuss the chemical working inside a battery.
			• Discuss different types of batteries.
			• Discuss what the numbering on a battery means.
			• A verbal or pen and paper test can follow

		• Remove and replace battery terminals and cables.
		  • Remove and replace terminals according to the manufacturer specifications.
		  • Select battery terminals according to the size specified by the manufacturer.
		  • Select cables according to appropriate current ratings as specified by the battery manufacturer.
		  • Adhere to the applicable SAFETY, HEALTH AND ENVIRONMENTAL (SHE) procedures during the process.
		  • Use all tools and equipment according to their design and workplace procedures.
			• Show learner how the task should be performed correctly.
			• Give learners a chance to individually perform the task themselves, under supervision.
			• A practical exam can now be done using a score sheet for each learner.

		• Restore work area, complete and process documentation.
		  • Clean the work area in accordance with the workplace and SAFETY, HEALTH AND ENVIRONMENTAL (SHE) requirements.
		  • Clean and store tools and equipment in accordance with workplace and SAFETY, HEALTH AND ENVIRONMENTAL (SHE) requirements.
		  • Explain the importance of storing the workplace in terms of safety hazards and production.
		  • Complete documentation and process it in accordance with workplace procedures.
		  • Explain documentation in terms of their main functions.
			• Discuss Safety, Heath, and Environmental (SHE) issues, when working with batteries and acid.
			• Include all these in the theory, and in the handbooks.

4-5	Demonstrate knowledge of lubrication	• Demonstrate knowledge of lubrication
		  • Recommended lubricant for different components.
		  • Explain the purpose of lubrication in accordance with specified requirements.
		  • Show examples of what happens if no lubrication is applied or incorrect.
		  • Show and show what happens when lubrication is mixed with other lubricants or foreign substances.
		  • Show the different properties and characteristics let learns look and touch each type of lubrication.
		  • Explain the characteristics of a lubricant in accordance with specified requirements.
		  • Explain the importance of identification of lubricant types in accordance with specified requirements.
		  • Explain the importance of using the lubricant, in accordance with the specified requirements.
		  • Explain the importance of lubrication frequency in accordance with specified requirements.
			• Demonstrate
			• Verbal discussion in theory class.
			• Refer to handbook, posters and other media.
			• Verbal or pen and paper test may be used.

		• Lubricate machines and equipment
		  • Identify the various lubrication methods in accordance with specified requirements.
		  • Select, examine and use the required personal protective equipment in a manner that protects the individual in accordance with specified requirements.
		  • Select and examine tools, material and equipment required in accordance with specified requirements.
		  • Demonstrate the ability to lubricate equipment or components in terms of specified requirements.
		  • Keep absolute cleanliness when working with lubricants in terms of specified requirements.
			• Discuss verbally, what safety equipment should be used and why.
			• Demonstrate practically on an actual component how it should be lubricated, why and what lubricant should be used.
			• Show the difference in the working ability of a well lubricated, and an unlubricated part.
			• Let learners perform the lubrication of a certain them self.
			• A score sheet can be used to evaluate each learner.

		• Demonstrate knowledge of the importance of the correct handling and storage of lubricants
		  • Demonstrate understanding about non-contamination of lubricants in accordance with specified requirements.
		  • Treat spillage incidents in accordance with specified requirements
		  • Decant oil from drums in accordance with specified requirements
		  • Deal with reclaimed lubricant in accordance with specified requirements
			• Discuss verbal how lubricants should be stored and why.
			• Show with a practical example what would happen if lubricants were to be contaminated before use.
			• Discuss why oil spillage is a hazard, show pictures of the environmental consequents'
			• Discuss the law implications of not dumping oil, and not disposing it off correctly, or recycling it

	Understand the fundamentals of engine technology	• Identify the various types of automotive engines and engine operation. • Identify the types of engines in terms of their key differences in operation	• Use pictures or video, but if possible the actual engine, to demonstrate differences. • Operation can be explained best by using computer simulations of the internal working of each type of engine. • Discuss the different types of engines (4-stroke petrol, 2- stroke petro, 4-stroke diesel)

		• Identify the function of the major parts of an automotive engine
		  • Identify the major parts and explain their function in accordance with design criteria.
		  • Identify the differences in major parts in relation to the type of engine.
		  • Identify the reasons for using specific major parts in relation to engine design.
			• Use picture of engine parts with their correct names and purpose inside the engine.
			• Also mention and discuss the materials each is made of.
			• If possible, obtain the real parts for learners to see and handle.
			• Practical verbal tests can be carried out by showing a part to a learner and asking them to give the name, or giving the name and the learner must point out the correct part.
			• All the work above will also be incorporated in the theory work.

		• Explain engine design classifications
		  • Classify engines in terms of their design differences.
		  • Explain differences in engine design in relation to the type of engine and its use.
		  • Explain reasons for using specific engine systems in relation to engine design.
			• Show pictures or computer images of different engine designs (inline engine, v- engine, horizontal engine, radial engine)
			• Also show engines with different number of cylinders.
			• Discuss engine capacity and how it is calculated.
			• Discuss valve and camshaft layouts like side valve, overhead valve, single overhead cam, double overhead cam, multivalve and cross flow engines.
			• Discuss the advantages and dis advantages of each.
			• Discuss where they are most commonly used.
			• All this must be repeated in the theory work.
			• Formal examination can be done in pen and paper.

		• Explain the various automotive engine systems, their functions and associated components
		  • Identify the engine systems and explain their function in accordance with design criteria.
		  • Explain the differences in engine systems in relation to the type of engine.
		  • Explain reasons for using specific engine systems in relation to engine design.
			• The real car or pictures can be used.
			• Discuss the different types of cooling.
			• Show the cooling the cooling system, and the all its components.
			• Discuss the function of each component
			• Discuss different type of lubrication systems.
			• Show the lubrication system, and all its parts.
			• Discuss the function of each component.
			• Show the fuel supply system, and all its components.
			• Discuss the different fuel supply systems used.
			• All the above will be reviewed in the theory class.
			• Learner will be subjected to a pen and paper test at the end of the term

		• Explain safe working practises related to automotive engines
		  • Identify workplace safety procedures.
		  • Identify personal protective equipment and explain its method of use.
		  • Explain the use of lifting equipment in accordance with safety legislation.
		  • Explain the consequences of not working safely in terms of risk of injury and loss of production.
			• Discuss fire hazards associated with automotive workshop.
			• Discuss the hazard of carbon monoxide poisoning.
			• Discuss why personal safety equipment like overall, shoes, gloves, safety glasses and respirators are needed.
			• Discuss safe operation of the car lift, engine crane, trolley jack and jack stands (trestles)
			• Discuss consequences and implication of accidents in the workshop.
			• Al of above must be reflected in the theory work as well.
			• All learners will be subjected to a pen and paper exam.

		• Interact with others in the workplace
		  • Explain the benefits of teamwork.
		  • Identify potential difficulties of working as a team member.
		  • Communicate clearly.
		  • Promote teamwork through interaction.
			• Discuss the advantages and disadvantages of working on a project as group compared to person completing a certain task on his own.
			• Make sure to communicate assignments clearly between teacher and learner (employer /employee) of what is expected of the learner / employee to be done.
			• Discuss the advantage of having people to assist in certain job, rather than doing it all by yourself.

9 – 10	Formal Assessment	The weeks allocated for formal assessment are integrated across the weeks planned for teaching and learning. The assessment will consist of Practical Task/s with a 75% weighting and a Theory test with a 25% weighting.
Activity 1: Demonstration 25% **Activity 2**: Practical 50% **Activity 3** Examination (half-yearly) Respond to questions Pen and paper (Oral or written) 25%		

Year 2 Term 3

WEEK	TOPIC	CONTENT **The learner is able to:**	**Techniques, activities, resources and process notes**

1-8	Carry out an automotive service	• Plan and prepare for servicing a vehicle
		  • Identify the service to be conducted from given documentation and manufacturer recommendations
		  • Identify all tools and equipment required to perform the service for use prior to commencing with the service
		  • Identify service replacement parts and confirmed to be available prior to commencing with the service
		  • Confirm reported faults by means of pre-operational check
		  • Describe consequences of continuing with the service when all requirements are not available in terms of productivity and utilization of workshop space
			• Discuss where to obtain necessary data and specifications of the car that is to be serviced
			• Demonstrate how to use a data book or a computer to obtain part numbers on oil filters, petrol filters, air cleaner and spark plugs
			• Also obtain the type and amount of oil needed
			• Discuss the tools needed to complete the service
			• Collect the tools and place them at hand
			• Check replacement parts to make sure that they were supplied correctly to commence with the service
			• Discuss the consequence to the car if a service is not completed correctly

		• Perform a service on a vehicle
		  • Conduct the service in accordance with the recommendations in the manufacturer's service schedule
		  • Describe the purpose of conducting a routine service in terms of manufactures warranty and vehicle reliability
		  • Drain or refill fluids according to workshop manual procedures
		  • Examine fluids for contamination according to workshop manual, procedures may include laboratory analysis
		  • Use tools and equipment in accordance with workshop procedures.
		Note any faults and deal with it in accordance with workshop procedures.
			• Demonstrate a sequential plan for conducting a service in accordance with the manufacturer's recommendations
			• Outline the service routine with regard to the manufacturer's warranty and the consequences of neglecting to do so
			• Learners should demonstrate understanding by identifying the tools and equipment that will be required.
			• Demonstrate how fluids are drained and refilled according to the workshop manual, as well as the procedure for examining fluids for contamination. Allow learners to replicate what they have observed and record the processes in the sequence they were undertaken

		• Apply a quality check on the serviced vehicle
		  • Inspect the vehicle visually for leaks and carry out a post operational check according to workshop procedures
		  • Inspect all fluid levels & confirm it to be in accordance with manufacturer specifications
		  • Explain reasons for post service checks in terms of quality control & customer satisfaction
		  • Identify quality checks on points in terms of their function and checking procedures
		  • Confirm, restore and report the operation, running condition or exactness of assembly after the assembly process, according to manufacturer's specifications.
			• Use a check list and give learner a chance to inspect the vehicle after the service for leaks, fluid level, and general running condition.

		• Apply safety procedures during the service
		  • Complete the service with the incident, accident or injury in accordance with SHE procedures and legislation
		  • Adhere to all safety warnings and required actions before, during and after servicing according to workshop safety manuals
		  • Follow applicable SHE procedures during the service.
			• Discuss and demonstrate how and why it is important to dispose of used oil and other fluids in the correct manner, environmentally and by law as stipulated by SHE.

		• Restore work area, complete and process documentation
		  • Clean the work area in accordance with workplace and SHE requirements
		  • Clean and store equipment in accordance with the workplace and SHE requirements
		  • Restore the workplace in terms of safety hazards and production
		  • Complete documentation & process in accordance with workplace procedures
		  • Explain use of various documentation and their main functions
			• Demonstrate the advantages of working in a clean neat environment.
			• Discuss the health and safety hazards caused by a dirty work place.
			• Discuss the environmental impact.
			• Use a checklist to asses if learner followed procedures satisfactory.
			• Demonstrate how to complete a job card correctly.

9 – 10	Formal Assessment	The weeks allocated for formal assessment are integrated across the weeks planned for teaching and learning. The assessment will consist of Practical Task/s with a 75% weighting and a Theory test with a 25% weighting.
Activity 1: Demonstration 25% **Activity 2**: Practical 50% **Activity 3** Test Respond to questions Pen and paper (Oral or written) 25%		

Year 2 Term 4

WEEK	TOPIC	CONTENT **The learner is able to:**	**Techniques, activities, resources and process notes**

1-7	Inspect and lubricate an automotive system	• Plan and prepare to inspect and lubricate an automotive system
		  • Prepare work area and automotive system for inspection and lubrication
		  • Obtain workshop manual and specifications appropriate to automotive system
		  • Obtain specified lubricants and fluids
		  • Select and obtain appropriate tools and equipment
		  • Prepare work area and automotive system in accordance with SAFETY, HEALTH AND ENVIRONMENTAL (SHE) requirements
		  • Explain the reason for selecting the appropriate workshop manual for the automotive system
			• Discuss preparation of the work area needed for an inspection and lubrication.
			• Discuss preparation of the automotive system for an inspection and lubrication.
			• Supply a workshop manual / digital manual and discuss where relevant information can be obtained.
			• Discuss how to select appropriate lubricants according to manual.
			• Discuss why specific tools were selected, and how they will be used in the process.

		• Drain, refill or top up fluids and apply lubricants
		  • Drain, refill or top up fluids and apply lubricants
		  • Check fluid levels in accordance with workshop manual procedures
		  • Normalize automotive system to operating temperature prior to draining of fluids
		  • Clean areas before and after draining fluids
		  • Drain fluids in accordance with workshop procedures
		  • Replace, drain and refill plugs in accordance with workshop manual procedures
		  • Clean filler areas prior to filling/topping up fluid compartment
		  • Refill fluid compartments/
		  • Top up with specified fluid and quantity
		  • Clean lubrication points prior lubrication
		  • Apply lubricants to lubrication points in accordance with workshop manual procedures
		  • Explain why system/s needs to be normalized prior to draining the oil
		  • Ensure correct fluid levels.
			• Discuss why it is necessary to service a vehicle
			• Discuss service intervals, on different vehicles
			• Demonstrate the correct way to drain the oil
			• Demonstrate how to remove the oil filter
			• Demonstrate how to fit the new filter
			• Demonstrate how to replace and tighten the oil drain plug correctly
			• Demonstrate how to refill the oil to the correct level without spilling
			  • Discuss the correct way to dispose of used oil and oil filter according to SAFETY, HEALTH AND ENVIRONMENTAL (SHE) law.
			• Now learners take turn in doing each of steps under supervision.
			• Each learner is being assessed while he is performing each of the steps.
			• Make use of a check list

		• Inspect and identify leaks and defects on automotive systems
		  • Inspect automotive system for leaks and defects
		  • Inspect visually for leaks and defects while system is in a static condition, and record findings
		  • Inspect automotive system for leaks under operational conditions and record findings
		  • Test functionality of system
		  • Explain why an automotive system needs to be inspected when static and operational.
			• Discuss the causes of leaks.
			• Discuss where leaks occur most of the time, and point them out on the vehicle.
			• Let learners check the mentioned places for leaks and report back on their findings.
			• Discuss the consequences of a leak and let learners discuss what would happen if it was left un attended.
			• If a leak is found discuss what causes it, and what can be done to rectify it.

		• Restore work areas, complete and process documentation
		  • Clean and pack away tools and equipment in accordance with company procedures
		  • Clean work area in accordance with good housekeeping requirements
		  • Dispose of hazardous materials in accordance with SAFETY, HEALTH AND ENVIRONMENTAL (SHE) requirements
		  • Complete documentation and process in accordance with company procedures
		  • Recall company procedures relating to the cleaning and packing away of tools and equipment
		  • Explain the impact of good housekeeping practices op productivity and a safe working environment
			• Remind learners of how the work area should be restored after work is finished.
			• Let learners restore work area, put away the tools, and clean the work area. A score sheet can be kept for evaluation.
			• Evaluate whether material was disposed of in accordance with SAFETY, HEALTH AND ENVIRONMENTAL (SHE)
			• Go through documentation with learners and discuss whether al processes were completed correctly, and where problems occurred.

8 – 10	Formal Assessment	The weeks allocated for formal assessment are integrated across the weeks planned for teaching and learning. The assessment will consist of Practical Task/s with a 75% weighting and a Theory test with a 25% weighting.
Activity 1: Demonstration 25% **Activity 2**: Practical 50% **Activity 3** Examination (year-end) Respond to questions Pen and paper (Oral or written) 25%		

Year 3 Term 1

WEEK	TOPIC	CONTENT **The learner is able to:**	**Techniques, activities, resources and process notes**

1	Keep the work area safe and productive	• Discuss and explain the purpose of safety equipment and procedures
		• Use fire-fighting equipment (fire extinguishers; fire hoses)
		• Identify and explain the purpose of demarcated areas, emergency stops, exits and first aid stations
		• Use personal protective equipment (overalls; safety glasses; dust mask; ear protection)
		• Perform housekeeping duties in work area
		• Identify and report unsafe or potentially unsafe conditions, incidents or acts that may occur.
		  • Demonstrate an understanding of safety issues at work
		  • Undertake all work in a safe manner according to established procedures
		  • Keep work area in a neat and tidy condition
		  • Report on safety issues as required
			• Verbal discussion of the reasons for safety measures in the workshop.
			• Discuss types of fires.
			• Demonstrate what type of fire equipment should be used on what type of fire and why.
			• Posters to press safety measures home.
			• Posters or digital media to show the importance of personal safety.
			• Learner must point out practical examples of un-safe acts or conditions in the workshop.

2-3	Select and use hand tools	• Select and use hand tools e.g. (spanners; sockets; ratchet; extensions; pliers; screwdrivers: hammers, Allen keys; torque wrench; thread cutting tools; ring squeeze; impact wrench)
		• Care for and maintain hand tools
		• Work safely with due care for self, fellow workers, equipment, materials and environment
		  ○ Explain and demonstrate safe working practices.
		  ○ Demonstrate an understanding of SHE procedures.
			• Test prior knowledge of hand tools, show actual tool, let learner handle the actual tool, ask learner to name the tools, give the correct name.
			• Demonstrate how a tool should be used correctly, using actual tool.
			• Demonstrate how to care for hand tools.
			• Text books can be used.
			• Pictures and video can be used

4-6	Select, use and care for engineering measuring equipment	• Explain and Discuss basic units of measure and symbols (millimetre – mm) • Select and use engineering measuring equipment e.g. (measuring tape; steel ruler; vernier callipers; feeler gauge) • Learners must be shown where each should be used. • Learners must be trained how to read vernier calliper measurements. • Care for and maintain measuring equipment • Recognise and report problems changes and/or malfunctions while working	• Discuss types of basic measurement units, where each is used and each symbol for each • Use posters and digital media • Show learners, the actual tool, let them handle it. • Now demonstrate how to use the tool, by using the actual tool • Assist learners in using the measuring tool themselves • Let learners use the measuring tool themselves. • Asses learners ability to read vernier callipers to the closest millimetre.(not smaller than that) • Discuss care and maintenance of measuring equipment.

7-8	Select, use and care for engineering power tools	• Care for and maintain engineering power tools • Recognise and report problems, changes and/or malfunctions while working (hand drill, drill press, angle grinder, bench grinder) • Work safely with due care for self, fellow workers, machines, equipment, materials and environment	• Discuss safety when using electrical equipment • Discuss personal safety when using a power tool. • Discuss safety of workers around you when using a power tool. • Test prior knowledge by asking learners to name the shown tool, and for what they are used. • Discuss care for power tools. • Show learners, the actual tool, let them handle it. • Now demonstrate how to use the tool, by using the actual tool. • Now assist learners in using a certain tool. • Now let the learners use the tool by themselves • Use the actual tool, posters and video.
9 – 10	Formal Assessment	The weeks allocated for formal assessment are integrated across the weeks planned for teaching and learning. The assessment will consist of Practical Task/s with a 75% weighting and a Theory test with a 25% weighting.	
Activity 1: Demonstration 25% **Activity 2**: Practical 50% **Activity 3** Test Respond to questions Pen and paper (Oral or written) 25%			

WEEK	TOPIC	CONTENT **The learner is able to:**	Techniques, activities, resources and process notes

1-2	Service automobile batteries	• Remove and fit an automotive battery.
		  • Check the battery for safety and condition prior to removal.
		  • Use personal protective equipment as in handling batteries.
		  • Identify and use relevant equipment to protect the vehicle when removing and fitting batteries.
		  • Explain uses of and different batteries in terms of manufacturer specifications.
		  • Secure batteries in accordance with manufacturer specifications.
		  • Remove and fit batteries according to the specified procedures in terms of costs, durability and safety.
			• Discuss verbally the condition of the battery, and what the signs of damage are. Pictures or examples of damaged batteries can be shown.
			• Explain why, and what protective equipment should be used when removing a battery or replacing it.
			• A verbal or pen and paper test can follow

		• Test batteries.
		  • Conduct the test in accordance with workplace procedures and manufacturer's recommendations.
		  • Test batteries in terms of manufacturer warranty and reliability.
		  • Interpret test results to determine the status of a battery.
		  • Use tools and test equipment in accordance with workshop procedures.
			• Show learner on an actual defective battery how the test should be done.
			• Now show learner how the test is performed on a working battery. And what the results should be.
			• Now let the learner perform the test himself, evaluate his results.
			Discuss different types of tests, what each test is used for.

		• Service batteries.
		  • Check the state of charge of the battery and confirm it to be in accordance with the manufacturer specifications.
		  • Charge the battery in accordance with the workplace and manufacturer requirements.
		  • Explain reason for charging a battery in terms of battery life and durability.
		  • Explain the operation of a battery in terms of the process of converting chemical energy into electrical energy.
		  • Explain the operation of a battery in terms of the process of converting chemical energy into electrical energy.
		  • Clean batteries in accordance with workplace procedures and manufacturer's specifications.
		  • Explain methods for working with solvents and acids in accordance with relevant health and safety procedures and legislation.
		  • Explain consequences of not working safely in terms of potential injury to personnel and damage to equipment.
			• Demonstrate how to check a battery for it state of charge using a multi-meter, or a hydrometer.
			• Now let the learners perform the test themselves.
			• Discuss verbally how a battery should be charged to extend its life.
			• Discuss the construction the construction and inner workings of a battery. Use pictures, or models.
			• Use pictures, or a cutaway model.
			• Discuss the chemical working inside a battery.
			• Discuss different types of batteries.
			• Discuss what the numbering on a battery means.
			• A verbal or pen and paper test can follow
			• Carry on theory work.

		• Remove and replace battery terminals and cables.
		  • Remove and replace terminals according to the manufacturer specifications.
		  • Select battery terminals according to the size specified by the manufacturer.
		  • Select cables according to appropriate current ratings as specified by the battery manufacturer.
		  • Adhere to the applicable SHE procedures during the process.
		  • Use all tools and equipment according to their design and workplace procedures
		• Restore work area, complete and process documentation.
		  • Clean the work area in accordance with the workplace and SHE requirements.
		  • Clean and store tools and equipment in accordance with workplace and SHE requirements.
		  • Explain the importance of storage in the workplace in terms of safety hazards and production.
		  • Complete documentation and process it in accordance with workplace procedures.
		  • Explain documentation in terms of their main functions.
			• Show learner how the task should be performed correctly.
			• Give learners the chances to perform the task themselves, under supervision.
			A practical exam can now be done using a score sheet for each learner.
			• Discuss safety, health, and environmental issues, when working with batteries and acid.
			• Include all these in the theory, and in the handbooks.

3-4	Demonstrate knowledge of lubrication	• Demonstrate knowledge of lubrication
		  • Explain the purpose of lubrication in accordance with specified requirements
		  • Explain the characteristics of lubrication in accordance with specified requirements
		  • Explain the importance of identification of lubricant types in accordance with specified requirements.
		  • Explain the importance of using the recommended lubricant for different components in accordance with the specified requirements.
		  • Explain the importance of lubrication frequency in accordance with specified requirements.
			• Verbal Discussion in theory class.
			• Refer to handbook, posters and other media.
			• Verbal or pen and paper test may be used.

		• Lubricate machines and equipment
		  • Select, examine and use the required personal protective equipment in a manner that protects the individual in accordance with specified requirements.
		  • Select and examine tools, material and equipment required in accordance with specified requirements.
		  • Identify the various lubrication methods in accordance with specified requirements.
		  • Demonstrate the ability to lubricate equipment or components in terms of specified requirements.
		  • Keep absolute cleanliness when working with lubricants in terms of specified requirements.
			• Discuss verbal what safety equipment should be used and why.
			• Demonstrate practically on an actual component how it should be lubricated, why and what lubricant should be used.
			• Show the difference in the working ability of a well lubricated, and an un-lubricated part.
			• Let learners perform the lubrication of a certain them self.
			A score sheet can be used to evaluate each learner.

		• Demonstrate knowledge of the importance of the correct handling and storage of lubricants
		  • Demonstrate understanding about non-contamination of lubricants in accordance with specified requirements.
		  • Treat spillage incidents in accordance with specified requirements
		  • Decant oil from drums in accordance with specified requirements
		  • Deal with reclaimed lubricant in accordance with specified requirements
			• Discuss verbally what safety equipment should be used for and why
			• Demonstrate practically on an actual component how it should be lubricated, why and what lubricant should be used
			• Show the difference in the working ability of a well lubricated, and an un-lubricated part
			• Let the learner perform the lubrication of a certain part them self
			A score sheet can be used to evaluate each learner

5-8	Understand the fundamentals of engine technology	• Identify the various types of automotive engines and engine operation. • Identify the types of engines in terms of their key differences in operation	• Use pictures or video, but if possible the actual engine, to demonstrate differences. • Operation can be explained best by using computer simulations of the internal working of each type of engine.

		• Identify the function of the major parts of an automotive engine
		  • Identify the major parts and explain their function in accordance with design criteria.
		  • Identify the differences in major parts in relation to the type of engine.
		  • Identify the reasons for using specific major parts in relation to engine design.
			• Use picture of engine parts with their correct names and purpose in- side the engine.
			• Also mention and Discuss the material each is made of.
			• If possible, obtain the real parts for learners to see and handle.
			• Practical verbal tests can be carried out by showing a part to a learner and asking them to give the name, or giving the name and the learner must point out the correct part.
			All the work above will also be incorporated in the theory work.

		• Explain engine design classifications
		  • Classify engines in terms of their design differences
		  • Explain differences in engine design in relation to the type of engine and its use
		  • Explain reasons for using specific engine systems in relation to engine design
			• Show pictures or computer images of different engine designs (inline engine, v- engine, horizontal engine)
			• Also show engines with different number of cylinders.
			• Discuss engine capacity and how it is calculated.
			• Discuss valve and camshaft layouts like side valve, overhead valve, single overhead cam, double overhead cam, multivalve and cross flow engines.
			• Discuss the advantages and dis advantages of each.
			• Discuss where they are used most commonly.
			• All this must be repeated in the theory work.
			Formal examination can be done in pen and paper.

		• Explain the various automotive engine systems, their functions and associated components
		  • Identify the engine systems and explain their function in accordance with design criteria
		  • Explain the differences in engine systems in relation to the type of engine
		  • Explain reasons for using specific engine systems in relation to engine design
			• The real car or pictures can be used.
			• Discuss the different types of cooling.
			• Show the cooling the cooling system, and the all its components.
			• Discuss the function of each component
			• Discuss different type of lubrication systems.
			• Show the lubrication system, and all its parts.
			• Discuss the function of each component.
			• Show the fuel supply system, and all its components.
			• Discuss the different fuel supply systems used.

		• Explain safe working practises related to automotive engines
		  • Identify workplace safety procedures
		  • Identify personal protective equipment and explain its method of use
		  • Explain the use of lifting equipment in accordance with safety legislation
		  • Explain the consequences of not working safely in terms of risk of injury and loss of production
			• Discuss fire hazards associated with workshop.
			• Discuss the hazard of carbon monoxide poisoning.
			• Discuss why personal safety equipment like overall, shoes, gloves, safety glasses and respirators are needed.
			• Discuss safe operation of the car lift , engine crane , trolley jack and jack stands (trestles)
			• Discuss consequences of accidents in the workshop.
			• Al of above must be reflected in the theory work as well.
			All learners will be subjected to a pen and paper exam.

		• Interact with others in the workplace
		  • Explain the benefits of teamwork
		  • Identify potential difficulties of working as a team member
		  • Communicate clearly
		  • Promote teamwork through interaction
			• Discuss the advantages and disadvantages of working on a project as group compared to person completing a certain task on his own.
			• Make sure to communicate assignments clearly between teacher and learner (employer /employee) of what is expected of the learner / employee to be done.
			• Discuss the advantage of having people to assist in certain job, rather than doing it all by yourself.

9 – 10	Formal Assessment	The weeks allocated for formal assessment are integrated across the weeks planned for teaching and learning. The assessment will consist of Practical Task/s with a 75% weighting and a Theory test with a 25% weighting.	
Activity 1: Demonstration 25% **Activity 2**: Practical 50% **Activity 3** Examination (half yearly) Respond to questions Pen and paper (Oral or written) 25%			

Year 3 Term 3

WEEK	TOPIC	CONTENT **The learner is able to:**	**Techniques, activities, resources and process notes**

1-2	Remove and fit automobile components	• Prepare to remove or fit automotive components
		  • Identify the components to be removed or fitted from given documentation and workplace instructions
		  • Check all tools and equipment required to perform the task and prepare for use prior to commencing with job.
		  • Confirm replacement parts or components required to be available prior to commencing with the job
		  • Explain the consequences of continuing with the task when all requirements are not available in terms of productivity and utilization of workshop space
		  • Make the vehicle safe to work on in accordance with vehicle manufacturer specifications.
			• Discuss the component to be removed, where it is situated on the vehicle, if it is necessary to put the to put the vehicle on a lift or jack it up to reach the component are there any other parts that needs to be removed before the component can be reached.
			• Discuss whether there will be any chance oil or coolant spilling in the process; prepare the work area accordingly if there is.
			• Discuss the tools that will be needed to complete the task, make sure that they are available.
			• Discuss whether the component to be removed will be replaced or can be repaired, or will have to be sent away to be repaired or re-engineered.

		• Remove and fit components.
		  • Remove or fit the component in accordance with workplace requirements and manufacturer recommendations
		  • Explain differences in major parts in relation to the type of engine
		  • Explain the purpose of closing off openings in terms of contamination and equipment reliability
		  • Connect components in accordance with manufacturer specifications
		  • Drain or fill fluids according to workshop manual procedures
		  • Use tools and equipment in accordance with workshop procedures
		  • Note any faults and deal with in accordance with workshop procedures-
		  • Conduct work in accordance with workplace and legislative health and safety requirements
			• Demonstrate how to remove the component while learners observe.
			• Now let learners assist.
			• Let learner the component under observation of the teacher.
			• Evaluate learner by completing a checklist while the learner is completing the task.

		• Inspect and test fitted components
		  • Inspect visually the component for leaks and perform post operational checks according to workshop procedures
		  • Inspect and confirm all fluid levels to be in with manufacturer specifications
		  • Test the component for functionality in accordance with the workplace requirements
		  • Ensure the component for functionality in accordance with workplace requirements
			• Discuss what defects or problems could be encountered when removing and fitting the component
			• Let learner now inspect his own work visually
			• Now other learners and the teacher inspect the work and asses the quality
			• Learners can be continually assessed using a score sheet

		• Apply safety procedures during the removing and fitting process
		  • Complete the work task without incident, accident of injury according to safety procedures.
		  • Ensure there is no damage to any component, vehicle, equipment or tools
		  • Adhere to all workshop manual safety warnings and required actions before, during and after component removal and fitting
			• Reflect on the safety measures that were employed during work process

		• Restore work area, complete and process documentation
		  • Clean the work area in accordance with workplace and SHE requirements
		  • Clean and store equipment in accordance with the workplace and SHE requirements
		  • Restore the workplace in terms of safety hazards and production
			• Reflect on the safety measures that were employed during work process.

3-6	Carry out an automotive service	• Plan and prepare for servicing a vehicle
		  • Identify the service to be conducted from given documentation and manufacturer recommendations
		  • Avail all tools and equipment required to perform the service for use prior to commencing with the service
		  • Identify service replacement parts and confirmed to be available prior to commencing with the service
		  • Confirm reported faults by means of pre-operational check
		  • Describe consequences of continuing with the service when all requirements are not available in terms of productivity and utilization of workshop space
			• Discuss where to obtain necessary data and specifications of the car that is to be serviced
			• Demonstrate how to use a data book or a computer to obtain part numbers on oil filter, petrol filters, air cleaner and spark plugs
			• Also obtain the type and amount of oil needed.
			• Discuss the tools needed to complete the service.
			• Collect the tools and place them at hand
			• Check replacement parts to make sure that they were supplied correctly to commence with the service
			• Discuss the consequence to the car if a service is not completed correctly.

		• Perform the service on the vehicle
		  • Conduct the service in accordance with service schedule manufacture's recommendations
		  • Describe the purpose of conducting a routine service in terms of manufactures warranty and vehicle reliability
		  • Drain or refill fluids according to workshop manual procedures.
		  • Examine fluids for contamination according to workshop manual procedures may include laboratory analysis
		  • Use tools and equipment in accordance with workshop procedures.
		  • Note any faults and deal with it in accordance with workshop procedures.
			• Discuss why it is necessary to service a vehicle.
			• Discuss service intervals, on different vehicles.
			• Demonstrate the correct way to drain the oil.
			• Demonstrate how to remove the oil filter
			• Demonstrate how to fit the new filter.
			• Demonstrate how to replace and tighten the oil drain plug correctly.
			• Demonstrate how to refill the oil to the correct level without spilling.
			• Discuss the correct way to dispose of used oil and oil filter according to SAFETY HEALTH AND ENVIRONMENT (SHE) law.
			• Now learners take turn in doing each of steps under supervision.
			• Each learner to be assessed while he is performing each of the steps
			• Make use of a check list

		• Apply quality checks on completed service
		  • Inspect the vehicle visually for leaks and carry out a post operational check according to workshop procedures
		  • Inspect all fluid levels & confirm it to be in accordance with manufacturer specifications
		  • Explain reasons for post service checks in terms of quality control & customer satisfaction
		  • Identify quality checks on points in terms of their function and checking procedures
		  • Confirm, restore and report the operation, running condition or exactness of assembly after the assembly process, according to worksite practice and/or manufacturer's specifications.
			• Use a check list and give learner a chance to inspect the vehicle after the service for leaks, fluid level, and general running condition

		• Apply safety procedures during the service
		  • Complete the service with the incident, accident or injury in accordance with SAFETY HEALTH AND ENVIRONMENT (SHE) procedures and legislation
		  • Adhere to all safety warnings and required actions before, during and after servicing according to workshop safety manuals.
		  • Follow applicable SAFETY HEALTH AND ENVIRONMENT (SHE) procedures during the service.
			• Discuss and demonstrate how and why it is important to dispose of used oil and other fluids in the correct manner, environmentally and by law as stipulated by SAFETY HEALTH AND ENVIRONMENT (SHE).

		• Restore work area, complete and process documentation • Clean the work area in accordance with workplace and SAFETY HEALTH AND ENVIRONMENT (SHE) requirements. • Clean and store equipment in accordance with the workplace and SAFETY HEALTH AND ENVIRONMENT (SHE) requirements. • Restore the workplace in terms of safety hazards and production. • Complete documentation & process in accordance with workplace procedures. • Explain use of various documentation and their main functions.	• Demonstrate the advantages of working in a clean neat environment. • Discuss the health and safety hazards caused by a dirty work place. • Discuss the environmental impact. • Use a checklist to asses if learner followed procedures satisfactorily. • Demonstrate how to complete a job card correctly.

7-8	Inspect and lubricate an automotive system	• Plan and prepare to inspect and lubricate an automotive system
		  • Prepare work area an automotive system for inspection and lubrication
		  • Obtain workshop manual and specifications appropriate to automotive system
		  • Obtain specified lubricants and fluids.
		  • Select and obtain appropriate tools and equipment
		  • Prepare work area and automotive system in accordance with SAFETY HEALTH AND ENVIRONMENT (SHE) requirements.
		  • Explain the reason for selecting the appropriate workshop manual for the automotive system
			• Discuss preparation of the work area needed for an inspection and lubrication.
			• Discuss preparation of the automotive system for an inspection and lubrication.
			• Supply a workshop manual / digital manual and discuss where relevant information can be obtained.
			• Discuss how to select appropriate lubricants according to manual.
			• Discuss why specific tools were selected, and how they will be used in the process.

		• Drain, refill or top up fluids and apply lubricants
		  • Check fluid levels in accordance with workshop manual procedures
		  • Normalize automotive system to operating temperature prior draining of fluids
		  • Clean areas before and after draining fluids.
		  • Drain fluids in accordance with workshop procedures
		  • Replace, drain and refill plugs in accordance with workshop manual procedures
		  • Clean filler areas prior to filling/topping up fluid compartment
		  • Refill fluid compartments/
		  • Top up with specified fluid and quantity
		  • Clean lubrication points prior lubrication
		  • Apply lubricants to lubrication points in accordance with workshop manual procedures.
		  • Explain why system/s needs to be normalized prior to draining the oil.
		  • Ensure correct fluid levels.
			• Discuss why it is necessary to service a vehicle
			• Discuss service intervals, on different vehicles
			• Demonstrate the correct way to drain the oil
			• Demonstrate how to remove the oil filter
			• Demonstrate how to fit the new filter
			• Demonstrate how to replace and tighten the oil drain plug correctly
			• Demonstrate how to refill the oil to the correct level without spilling
			• Discuss the correct way to dispose of used oil and oil filter according to SAFETY, HEALTH AND ENVIRONMENTAL (SHE) law.
			• Now learners take turn in doing each of steps under supervision.
			• Each learner is being assessed while he is performing each of the steps.
			• Make use of a check list.

		• Inspect and identify leaks and defects on automotive system
		  • Inspect automotive system for leaks and defects.
		  • Inspect visually for leaks and defects while system is in a static condition, and record findings.
		  • Inspect automotive system for leaks under operational conditions and record findings.
		  • Test functionality of system
		  • Explain why an automotive system needs to be inspected when static and operational.
			• Discuss the causes of leaks.
			• Discuss where leaks occur most of the time, and point them out on the vehicle.
			• Let learners check the mentioned places for leaks and report back on their findings.
			• Discuss the consequences of an leak and let learners discuss what would happen if it was left un attended.
			• If a leak is found discuss what causes it, and what can be done to rectify it.

		• Restore work area, complete and process documentation
		  • Restore work area, complete and process documentation.
		  • Clean and pack away tools and equipment in accordance with company procedures
		  • Clean work area in accordance with good housekeeping requirements
		  • Dispose of hazards materials in accordance with SHE requirements
		  • Complete documentation and process in accordance with company procedures.
		  • Recall company procedures relating to the cleaning and packing away of tools and equipment
		  • Explain the impact of good housekeeping practices op productivity and a safe working environment
			• Remind learners of how the work area should be restored after work is finished.
			• Let learners restore work area, put away the tools, and clean the work area. A score sheet can be kept for evaluation.
			• Evaluate whether material was disposed of in accordance with SAFETY, HEALTH AND ENVIRONMENTAL (SHE)
			• Go through documentation with learners and discuss whether al processes were completed correctly, and where problems occurred.

9 – 10	Formal Assessment	The weeks allocated for formal assessment are integrated across the weeks planned for teaching and learning. The assessment will consist of Practical Task/s with a 75% weighting and a Theory test with a 25% weighting.
Activity 1: Demonstration 25% **Activity 2**: Practical 50% **Activity 3** Test Respond to questions Pen and paper (Oral or written) 25%		

WEEK	TOPIC	CONTENT The learner is able to:	Techniques, activities, resources and process notes

1-3	Demonstrate basic knowledge of hydraulic components	• Demonstrate basic knowledge of hydraulic components and their application
		  • Identify components by name and explain their functions
		  • Explain the purpose of the components in relation to the hydraulic circuit
		  • Identify differences in component types and explain in relation to the method of functioning
			• Explain the basic principal of hydraulics, by using a pair of syringes, water and some transparent tubing.
			• Use pictures or a computer generated diagram that shows the internal workings of the master cylinder, wheel cylinders and brake callipers.
			• Point out the master cylinder on an actual vehicle and explain how it works
			• Point out the wheel cylinders on an actual vehicle and explain how it works
			• Point out the brake callipers on the actual vehicle and explain how they work.
			• Explain the purpose of brake fluid in the system
			• Explain the properties and hazards of brake fluid.

		• Describe safety aspects related to hydraulic systems
		  • Explain consequences of pressure in hydraulic system in relation to personal safety.
		  • Explain the effects of hydraulic fluids in terms of safety, health and environmental requirements.
			• Explain what happens when brake fluid comes in contact with automotive paint.
			• Explain the risk of brake fluid coming in contact with skin and eyes.
			• Explain first-aid action if brake fluid cone in contact with skin, eyes or is swallowed.
			• Explain the environmental hazards that brake fluid poses when spilled or disposed of in appropriately.

4-7	Perform basic welding/joining of metals	• Prepare for work activity
		  • Prepare for work activity by reading job instructions to determine sequence of operations
		  • Select the required heat related welding/joining equipment and consumables
		  • Carry out the pre-operational checks on equipment correctly
		  • Report on the unsafe or worn parts or defective equipment or potential hazards in the required format
		  • Prepare materials for welding/joining
		  • Use special personal protective equipment during the operation
			• Explain safety issues when using electricity
			• Explain danger of arc eyes
			• Explain danger of burning while welding
			• Discuss type of welding to be used
			• Discuss type of metals that can or cannot be welded/joined
			• Discuss types of welding rods to be used for certain metals
			• Discuss the preparation of the materials for welding and joining

		• Weld/join metals
		  • Prepare the work area for welding/joining process
		  • Secure the work area
		  • Use an appropriate weld/join process
		  • Weld/join the metal correctly to give a good quality finish
			• Explain why it is important to prepare the work area before starting the welding process
			• Demonstrate how the welding process should be conducted, by doing it while learners are observing
			• Let the learners do the process themselves while being closely observed by the teacher
			• Let learners individually do the preparation and welding / joining process by himself

		• Apply quality checks on completed welt / joint
		  • Clean the weld/join correctly.
		  • Conduct visual checks for quality finishes at the end of the process.
			• Show learners how a good weld / joint should look
			• Show learners what defect should be checked for after a weld / joint is completed
			• Discuss the causes of defect in a weld or a joint

		• Performing finishing activities
		  • Dispose of scrap material according to organisational procedure.
		  • Store surplus materials according to organisational procedure.
		  • Clean and store equipment according to organisational procedure.
			• Discuss the proper storage and disposal of material

		• Report out of compliance or un safe conditions while working ○ Report problems with materials and equipment.	• Discuss problems that should be checked for in welding equipment
8 – 10	Formal Assessment	The weeks allocated for formal assessment are integrated across the weeks planned for teaching and learning. The assessment will consist of Practical Task/s with a 75% weighting and a Theory test with a 25% weighting.	
Activity 1: Demonstration 25% **Activity 2**: Practical 50% **Activity 3** Examination (year-end) Respond to questions Pen and paper (Oral or written) 25%			

Year 4 Term 1

WEEK	TOPIC	CONTENT **The learner is able to:**	Techniques, activities, resources and process notes

1	Service automobile batteries
	
	Keep the work area safe and productive
		• **Remove and fit an automotive battery.**
		  • Check the battery for safety and condition prior to removal
		  • Use personal protective equipment as in handling batteries
		  • Identify and use relevant equipment to protect the vehicle when removing and fitting batteries
		  • Explain uses of and different batteries in terms of manufacturer specifications
		  • Secure batteries in accordance with manufacturer specifications
		  • Remove and fit batteries according to the specified procedures in terms of costs, durability and safety
			• Verbal Discussion of the reasons for safety measures in the workshop
			• Discuss types of fires
			• Demonstrate what type of fire equipment should be used on what type of fire and why
			• Posters to press safety measures home
			• Posters or digital media to show the importance of personal safety
			• Learner must point out practical examples of un-safe acts or conditions in the workshop
			• Show learner how the task should be performed correctly.
			• Give learners the chances to perform the task themselves, under supervision.
			
			A practical exam can now be done using a score sheet for each learner.
			
			• Discuss safety, health, and environmental issues, when working with batteries and acid.
			• Include all these in the theory, and in the handbooks.

2-3	Select and use hand tools	• Select and use hand tools (spanners; sockets; ratchet; extensions; pliers; screwdrivers: hammers, allen keys; torque wrench; thread cutting tools; ring squeeze; impact wrench) • Care for and maintain hand tools • Work safely with due care for self, fellow workers, equipment, materials and environment	• Test prior knowledge by asking learners to name the shown tool, and for what they are used. • Show learner, the actual tool, let them handle it. • Now demonstrate how to use the tool, by using the actual tool. • Now let the learner use the tool.
4-6	Select, use and care for engineering measuring equipment	• Explain and Discuss basic units of measure and symbols (millimetre – mm) • Select and use engineering measuring equipment • (measuring tape; steal ruler; vernier calliper; feeler gauge) • Learners must be shown where each should be used. • Learners must be trained how to read vernier calliper measurements to a tenth of a milimeter • Care for and maintain measuring equipment • Recognise and report problems changes and/or malfunctions while working	• Discuss types of basic measurement units, where each is used and each ones symbol. • Use posters and digital media. • Show learner, the actual tool, let them handle it. • Now demonstrate how to use the tool, by using the actual tool. • Asses learners' ability to read vernier callipers to the closest tenth of a millimetre. • Assist learner in using the measuring tool. • Let learner use the measuring tool. • Discuss care and maintain of measuring equipment. •

7-8	Select, use and care for engineering power tools	• Care for and maintain engineering power tools • Recognise and report problems, changes and/or malfunctions while working (Hand drill, drill press, angle grinder, bench grinder) • Work safely with due care for self, fellow workers, machines, equipment, materials and environment	• Test prior knowledge by asking learners to name the shown tool, and for what they are used. • Discuss safety when using electrical equipment. • Discuss personal safety when using a power tool. • Discuss safety of workers around you when using a power tool. • Discuss care for power tools. • Show learner, the actual tool, let them handle it. • Now demonstrate how to use the tool, by using the actual tool. • Now assist learners in using a certain tool. • Now let the learners use the tool. • Use the actual tool, posters and video.
9 – 10	Formal Assessment	The weeks allocated for formal assessment are integrated across the weeks planned for teaching and learning. The assessment will consist of Practical Task/s with a 75% weighting and a Theory test with a 25% weighting.	
Activity 1: Demonstration 25% **Activity 2**: Practical 50% **Activity 3** Test Respond to questions Pen and paper (Oral or written) 25%			

Year 4 Term 2

WEEK	TOPIC	CONTENT **The learner is able to:**	**Techniques, activities, resources and process notes**

1-2	Service automobile batteries	• Remove and fit an automotive battery.
		  • Check the battery for safety and condition prior to removal.
		  • Use personal protective equipment as in handling batteries.
		  • Identify and use relevant equipment to protect the vehicle when removing and fitting batteries.
		  • Explain uses of and different batteries in terms of manufacturer specifications.
		  • Secure batteries in accordance with manufacturer specifications.
		  • Remove and fit batteries according to the specified procedures in terms of costs, durability and safety.
			Service automobile batteries
			• Discuss verbally the condition of the battery, and what the signs of damage are. Pictures or examples of damaged batteries can be shown.
			• Explain why, and what protective equipment should be used when removing a battery or replacing it.
			• A verbal or pen and paper test can follow

		• Test batteries.
		  • Conduct the test in accordance with workplace procedures and manufacturer's recommendations.
		  • Test batteries in terms of manufacturer warranty and reliability.
		  • Interpret test results to determine the status of a battery.
		  • Use tools and test equipment in accordance with workshop procedures.
			• Show learner on an actual defective battery how the test should be done.
			• Now show learner how the test is performed on a working battery. And what the results should be.
			• Now let the learners perform the test themselves, evaluate their results.
			• Discuss different types of tests, what each test is used for.

		• Service batteries.
		  • Check the state of charge of the battery and confirm it to be in accordance with the manufacturer specifications.
		  • Charge the battery in accordance with the workplace and manufacturer requirements.
		  • Explain reason for charging a battery in terms of battery life and durability.
		  • Explain the operation of a battery in terms of the process of converting chemical energy into electrical energy.
		  • Explain the operation of a battery in terms of the process of converting chemical energy into electrical energy.
		  • Clean batteries in accordance with workplace procedures and manufacturers specifications.
		  • Explain methods for working with solvents and acids in
			• Demonstrate how to check a battery for it state of charge using a multi-meter, or a hydrometer.
			• Now let the learners perform the test themselves.
			• Discuss verbally how a battery should be charged to extend its life.
			• Discuss the construction and inner workings of a battery. Use pictures, or a cutaway models.
			• Discuss the chemical working inside a battery.
			• Discuss different types of batteries.
			• Discuss what the numbering on a battery means.
			• A verbal or pen and paper test can follow
			• Carry on theory work.

		accordance with relevant health and safety procedures and legislation. • Explain consequences of not working safely in terms of potential injury to personnel and damage to equipment.	

		• Remove and replace battery terminals and cables.
		  • Remove and replace terminals according to the manufacturer specifications
		  • Select battery terminals according to the size specified by the manufacturer
		  • Select cables according to appropriate current ratings as specified by the battery manufacturer
		  • Adhere to the applicable SAFETY HEALTH AND ENVIRONMENT (SHE) procedures during the process
		  • Use all tools and equipment according to their design and workplace procedures
		• Restore work area, complete and process documentation.
		  • Clean the work area in accordance with the workplace and SAFETY HEALTH AND ENVIRONMENT (SHE) requirements
		  • Clean and store tools and equipment in accordance with workplace and SAFETY HEALTH AND ENVIRONMENT (SHE) requirements
		  • Explain the importance of storing the workplace in terms of
			Note: learners will observe the task being performed, then perform the task while being assisted by the teacher and then perform the task without assistance. During the last stage the teacher may asses the work using a rubric or a score sheet.
			• Show learner how the task should be performed correctly.
			• Give learners the chances to perform the task themselves, under supervision
			A practical exam can now be done using a score sheet for each learner
			• Discuss Safety, Heath, and Environmental issues, when working with batteries and acid
			• Include all these in the theory, and in the handbooks

		safety hazards and production • Complete documentation and process it in accordance with workplace procedures • Explain documentation in terms of their main functions	
3-4	Demonstrate knowledge of lubrication	• Demonstrate knowledge of lubrication • Explain the purpose of lubrication in accordance with specified requirements • Explain the characteristics of lubrication in accordance with specified requirements • Explain the importance of identification of lubricant types in accordance with specified requirements. • Explain the importance of using the recommended lubricant for different components in accordance with the specified requirements. • Explain the importance of lubrication frequency in accordance with specified requirements.	• Use posters or multi- media to explain the origins of lubricants, their properties, qualities and their uses. • Show physical examples of each type of lubricant, let learners smell, touch and feel each lubricant. • Demonstrate properties with small experiments to show how it reduces friction between surfaces, how it reduces heat and how it reacts to heat. • Verbal Discussion in theory class. • Refer to handbook, posters and other media. • Verbal or pen and paper test may be used.

		• Lubricate machines and equipment
		  • Select, examine and use the required personal protective equipment in a manner that protects the individual in accordance with specified requirements.
		  • Select and examine tools, material and equipment required in accordance with specified requirements.
		  • Identify the various lubrication methods in accordance with specified requirements.
		  • Demonstrate the ability to lubricate equipment or components in terms of specified requirements.
		  • Keep absolute cleanliness when working with lubricants in terms of specified requirements.
			• Discuss verbally what safety equipment should be used and why.
			• Demonstrate practically on an actual component how it should be lubricated, why and what lubricant should be used.
			• Show the difference in the working ability of a well lubricated, and an un-lubricated part.
			• Let learners perform the lubrication of a certain them self.
			A score sheet can be used to evaluate each learner.

		• Demonstrate knowledge of the importance of the correct handling and storage of lubricants
		  • Demonstrate understanding about non-contamination of lubricants in accordance with specified requirements.
		  • Treat spillage incidents in accordance with specified requirements
		  • Decant oil from drums in accordance with specified requirements
		  • Deal with reclaimed lubricant in accordance with specified requirements
			• Discuss verbal how lubricants should be stored and why.
			• Show with a practical example what would happen if lubricants were to be contaminated before use.
			• Discuss why oil spillage is a hazard, show pictures of environmental consequences
			• Discuss the law implications of not dumping oil, and not disposing it of correctly, or recycling it.
			• **Note:** Multi- media can be used here to great effect, but a hands on approach can be incorporated to show learners what the effect of e.g. contaminated oil can be.

5-8	Understand the fundamentals of engine technology	• Identify the various types of automotive engines and engine operation. • Identify the types of engines in terms of their key differences in operation	• Use pictures or video, but if possible the actual engine, to demonstrate differences. • Operation can be explained best by using computer simulations of the internal working of each type of engine.

		• Identify the function of the major parts of an automotive engine
		  • Identify the major parts and explain their function in accordance with design criteria
		  • Identify the differences in major parts in relation to the type of engine
		  • Identify the reasons for using specific major parts in relation to engine design
			• Use picture of engine parts with their correct names and purpose in- side the engine
			• Also mention and discuss the materials each which are made of
			• If possible, obtain the real parts for learners to see and handle
			• Practical verbal tests can be carried out by showing a part to learners and asking them to give the name, or giving the name and learners must point out the correct part
			All the work above will also be incorporated in the theory work

		• Explain engine design classifications
		  • Classify engines in terms of their design differences
		  • Explain differences in engine design in relation to the type of engine and its use
		  • Explain reasons for using specific engine systems in relation to engine design
			• Show pictures or computer images of different engine designs (inline engine, v- engine, horizontal engine, radial engine)
			• Also show engines with different number of cylinders.
			• Discuss engine capacity and how it is calculated
			• Discuss valve and camshaft layouts like side valve, overhead valve, single overhead cam, double overhead cam, multivalve and cross flow engines
			• Discuss the advantages and dis advantages of each.
			• Discuss where they are most commonly used
			• All this must be repeated in the theory work
			Formal examination can be done in pen and paper

		• Explain the various automotive engine systems, their functions and associated components
		  • Identify the engine systems and explain their function in accordance with design criteria
		  • Explain the differences in engine systems in relation to the type of engine
		  • Explain reasons for using specific engine systems in relation to engine design
			• The real car or pictures can be used
			• Discuss the different types of cooling
			• Show the cooling the cooling system, and the all its components
			• Discuss the function of each component
			• Discuss different type of lubrication systems
			• Show the lubrication system, and all its parts
			• Discuss the function of each component
			• Show the fuel supply system, and all its components
			• Discuss the different fuel supply systems used

		• Explain safe working practises related to automotive engines
		  • Identify workplace safety procedures
		  • Identify personal protective equipment and explain its method of use
		  • Explain the use of lifting equipment in accordance with safety legislation
		  • Explain the consequences of not working safely in terms of risk of injury and loss of production
			• Discuss fire hazards associated with automotive workshop.
			• Discuss the hazard of carbon monoxide poisoning.
			• Discuss why personal safety equipment like overall, shoes, gloves, safety glasses and respirators are needed.
			• Discuss safe operation of the car lift , engine crane , trolley jack and jack stands (trestles)
			• Discuss consequences and implication of accidents in the workshop.
			• All of above must be reflected in the theory work as well.
			All learners will be subjected to a pen and paper exam.

		• Interact with others in the workplace
		  • Explain the benefits of teamwork
		  • Identify potential difficulties of working as a team member
		  • Communicate clearly
		  • Promote teamwork through interaction
			• Discuss the advantages and disadvantages of working on a project as group compared to person completing a certain task on his own.
			• Make sure to communicate assignments clearly between teacher and learner (employer /employee) of what is expected of the learner / employee to be done.
			Discuss the advantage of having people to assist in certain job, rather than doing it all by yourself.

9 – 10	Formal Assessment	The weeks allocated for formal assessment are integrated across the weeks planned for teaching and learning. The assessment will consist of Practical Task/s with a 75% weighting and a Theory test with a 25% weighting.
Activity 1: Demonstration 25% **Activity 2**: Practical 50% **Activity 3** Examination (half yearly) Respond to questions Pen and paper (Oral or written) 25%		

Year 4 Term 3

WEEK	TOPIC	CONTENT **The learner is able to:**	**Techniques, activities, resources and process notes**

Week
 	
1
	Remove and fit automobile components	• Prepare to remove or fit automotive components
		  • Identify the components to be removed or fitted from given documentation and workplace instructions
		  • Check all tools and equipment required to perform the task and prepare for use prior to commencing with job.
		  • Confirm replacement parts or components required to be available prior to commencing with the job
		  • Explain the consequences of continuing with the task when all requirements are not available in terms of productivity and utilization of workshop space
		  • Make the vehicle safe to work on in accordance with vehicle manufacturer specifications
			• Discuss the component to be removed, where it is situated on the vehicle, if it is necessary to put the to put the vehicle on a lift or jack it up to reach the component are there any other parts that needs to be removed before the component can be reached
			• Discuss whether will be any chance oil or coolant spilling in the process, prepare the work area accordingly if there is
			• Discuss the tools that will be needed to complete the task, make sure that they are available
			• Discuss whether the component to be removed will be replaced or can be repaired, or will have to be sent away to be repaired or re-engineered

		• Remove and fit components.
		  • Remove or fit the component in accordance with workplace requirements and manufacturer recommendations
		  • Explain differences in major parts in relation to the type of engine
		  • Explain the purpose of closing off openings in terms of contamination and equipment reliability
		  • Connect components in accordance with manufacturer specifications
		  • Drain or fill fluids according to workshop manual procedures
		  • Use tools and equipment in accordance with workshop procedures
		  • Note any faults and deal with in accordance with workshop procedures-
		  • Conduct work in accordance with workplace and legislative health and safety requirements
			• Demonstrate how to remove the component while learners observe
			• Now let learners assist
			• Let the learners use the component under observation of the teacher
			• Evaluate learners by completing a checklist while they complete the task

		• Inspect and test fit components
		  • Inspect visually the component for leaks and perform post operational checks according to workshop procedures
		  • Inspect all fluid levels to be in with manufacturer spec
		  • Test the component for functionality in accordance with the workplace requirements.
		  • Ensure the component for functionality in accordance with workplace requirements.
			• Discuss what defects or problems could be encountered when removing and fitting the component.
			• Let learner now inspect his own work visually.
			• Now other learners and teacher inspect the work and asses the quality.
			• Learner can be continually assessed using a score sheet.

		• Apply safety procedures during the removal and fitting process
		  • Complete the work task without incident, accident of injury according to safety procedures.
		  • Ensure there is no damage to any component, vehicle, equipment of tools
		  • Adhere to all workshop manual safety warnings and required actions before, during and after component removal and fitting
			• Reflect on the safety measures that were employed during work process.
			• Were any other components damaged or altered in the process?
			• Discuss what precautions were taken to prevent damage to the vehicle, component or injuries to the person.
			• Use a check list to confirm all precautions were in place.

		• Restore work area, complete and process documentation
		  • Clean the work area in accordance with workplace and SAFETY HEALTH AND ENVIRONMENTAL (SHE) requirements
		  • Clean and store equipment in accordance with the workplace (SHE) requirements
		  • Restore the workplace in terms of safety hazards and production
			• Reflect on the safety measures that were employed during work process.

Week
2-3
	Carry out an automotive service	• Plan and prepare for servicing a vehicle
		  • Identify the service to be conducted from given documentation and manufacturer recommendations.
		  • Avail all tools and equipment required to perform the service for use prior to commencing with the service.
		  • Identify service replacement parts and confirmed to be available prior to commencing with the service.
		  • Confirm reported faults by means of pre-operational check
		  • Describe consequences of continuing with the service when all requirements are not available in terms of productivity and utilization of workshop space
			• Discuss where to obtain necessary data and specifications of the car that is to be serviced.
			• Demonstrate how to use a data book or a computer to obtain part numbers on oil filters, petrol filters, air cleaner and spark plugs.
			• Also obtain the type and amount of oil needed.
			• Discuss the tools needed to complete the service.
			• Collect the tools and place them at hand.
			• Check replacement parts to make sure that they were supplied correctly to commence with the service
			• Discuss the consequence to the car if a service is not completed correctly.

		• Perform the service on the vehicle
		  • Conduct the service in accordance with service schedule manufacturer's recommendations
		  • Describe the purpose of conducting a routine service in terms of manufactures warranty and vehicle reliability
		  • Drain or refill fluids according to workshop manual procedures.
		  • Examine fluids for contamination according to workshop manual procedures may include laboratory analysis
		  • Use tools and equipment in accordance with workshop procedures.
		  • Note any faults and deal with them in accordance with workshop procedures.
			• Discuss why it is necessary to service a vehicle.
			• Discuss service intervals, on different vehicles.
			• Demonstrate the correct way to drain the oil.
			• Demonstrate how to remove the oil filter
			• Demonstrate how to fit a new filter.
			• Demonstrate how to replace and tighten the oil drain plug correctly.
			• Demonstrate how to refill the oil to the correct level without spilling.
			• Discuss the correct way to dispose of used oil and oil filter according to SAFETY HEALTH AND ENVIRONMENTAL (SHE) law
			• Demonstrate how to remove the air cleaner.
			• Inspect the old air cleaner and discuss the consequences of driving with a dirty air cleaner.
			• Demonstrate the correct way to fit the new air cleaner.
			• Demonstrate the correct way to remove the petrol filter.
			• Employ SAFETY HEALTH AND ENVIRONMENTAL (SHE) to correct way to dispose of old petrol filters and spilled petrol.
			• Demonstrate how to fit the new filter.
			• Discuss the dangers of driving with dirty petrol filter.
			• Discuss where contaminants come from that are found in the petrol filter.
			• Discuss different types of spark plugs and what the

			number on a spark plug means. (BP6ES) • Demonstrate the correct way, and order in which the spark plugs should be removed. • Demonstrate how to set the spark plug gap according to the manufacturer's specification by using a spark plug gauge or a feeler gauge. • Demonstrate how to fit the new spark plugs, and tighten them correctly. • Discuss the consequences of driving with old worn spark plugs. • The car is started and general running is assessed. • Check oil pressure. • Check oil filter, petrol filter and sump plug for any leaks. • Now learners take turns in doing each of steps under supervision. • Each learner is being assessed while he is performing each of the steps. • Make use of a check list

		• Apply quality checks on completed service
		  • Inspect the vehicle visually for leaks and carry out a post operational check according to workshop procedures
		  • Inspect all fluid levels & confirm it to be in accordance with manufacturer specifications
		  • Explain reasons for post service checks in terms of quality control & customer satisfaction
		  • Identify quality checks on points in terms of their function and checking procedures
		  • Confirm, restore and report the operation, running condition or exactness of assembly after the assembly process, according to worksite practice and/or manufacturer's specifications.
			• Use a check list and give learner a chance to inspect the vehicle after the service for leaks, fluid level, and general running condition.
			• Learners complete a pen and paper test.

		• Apply safety procedures during the service
		  • Complete the service with the incident, accident or injury in accordance with SAFETY HEALTH AND ENVIRONMENTAL (SHE) procedures and legislation
		  • Adhere to all safety warnings and required actions before, during and after servicing according to workshop safety manuals.
		  • Follow applicable SAFETY HEALTH AND ENVIRONMENTAL (SHE) procedures during the service.
			• Discuss and demonstrate how and why it is important to dispose of used oil and other fluids in the correct manner, environmentally and by law as stipulated by SAFETY HEALTH AND ENVIRONMENTAL (SHE).

		• Restore work area, complete and process documentation
		  • Clean the work area in accordance with workplace and SAFETY HEALTH AND ENVIRONMENTAL (SHE) requirements.
		  • Clean and store equipment in accordance with the workplace and SAFETY HEALTH AND ENVIRONMENTAL (SHE) requirements.
		  • Restore the workplace in terms of safety hazards and production.
		  • Complete documentation & process in accordance with workplace procedures.
		  • Explain use of various documentation and their main functions.
			• Demonstrate the advantages of working in a clean neat environment.
			• Discuss the health and safety hazards caused by a dirty work place.
			• Discuss the environmental impact.
			• Use a checklist to asses if learner followed procedures satisfactorily.
			• Demonstrate how to complete a job card and other documents correctly.

Week
4
	Inspect and lubricate an automotive system	• Plan and prepare to inspect and lubricate an automotive system
		  • Prepare work area an automotive system for inspection and lubrication
		  • Obtain workshop manual and specifications appropriate to automotive system
		  • Obtain specified lubricants and fluids.
		  • Select and obtain appropriate tools and equipment
		  • Prepare work area and automotive system in accordance with SAFETY HEALTH AND ENVIRONMENTAL (SHE) requirements.
		  • Explain the reason for selecting the appropriate workshop manual for the automotive system
			• Discuss why it is necessary to service a vehicle.
			• Discuss service intervals, on different vehicles.
			• Demonstrate the correct way to drain the oil.
			• Demonstrate how to remove the oil filter
			• Demonstrate how to fit a new filter.
			• Demonstrate how to replace and tighten the oil drain plug correctly.
			• Demonstrate how to refill the oil to the correct level without spilling.
			• Discuss the correct way to dispose of used oil and oil filter according to SAFETY HEALTH AND ENVIRONMENTAL (SHE) law.
			• Now learners take turns in doing each of steps under supervision.
			• Each learner is being assessed while he is performing each of the steps.
			Make use of a check list

		• Drain, refill or top up fluids and apply lubricants
		  • Check fluid levels in accordance with workshop manual procedures
		  • Clean areas before and after draining fluids.
		  • Drain fluids in accordance with workshop procedures
		  • Replace, drain and refill plugs in accordance with workshop manual procedures
		  • Top up with specified fluid and quantity
		  • Clean lubrication points prior lubrication
		  • Apply lubricants to lubrication points in accordance with workshop manual procedures.
		  • Ensure correct fluid levels.
			• Discuss why it is necessary to service a vehicle
			• Discuss service intervals, on different vehicles
			• Demonstrate the correct way to drain the oil
			• Demonstrate how to remove the oil filter
			• Demonstrate how to fit the new filter
			• Demonstrate how to replace and tighten the oil drain plug correctly
			• Demonstrate how to refill the oil to the correct level without spilling
			• Discuss the correct way to dispose of used oil and oil filter according to SAFETY, HEALTH AND ENVIRONMENTAL (SHE) law.
			• Now learners take turn in doing each of steps under supervision.
			• Each learner is being assessed while he is performing each of the steps.
			• Make use of a check list.

		• Inspect and identify leaks and defects on automotive systems
		  • Inspect automotive system for leaks and defects.
		  • Inspect visually for leaks and defects while system is in a static condition, and record findings.
		  • Inspect automotive system for leaks under operational conditions and record findings.
		  • Test functionality of system
		  • Explain why an automotive system needs to be inspected when static and operational.
			• Discuss the causes of leaks.
			• Discuss where leaks occur most of the time, and point them out on the vehicle.
			• Let learners check the mentioned places for leaks and report back on their findings.
			• Discuss the consequences of an leak and let learners discuss what would happen if it was left un attended.
			• If a leak is found discuss what causes it, and what can be done to rectify it.

		• Restore work area, complete and process documentation.
		  • Clean and pack away tools and equipment in accordance with company procedures
		  • Clean work area in accordance with good housekeeping requirements
		  • Dispose of hazards materials in accordance with SAFETY HEALTH AND ENVIRONMENTAL (SHE) requirements
		  • Complete documentation and process in accordance with company procedures.
		  • Recall company procedures relating to the cleaning and packing away of tools and equipment
		  • Explain the impact of good housekeeping practices op productivity and a safe working environment
			Remind learners of how the work area should be restored after work is finished.
			• Let learners restore work area, put away the tools, and clean the work area. A score sheet can be kept for evaluation.
			• Evaluate whether materials were disposed of in accordance with SAFETY, HEALTH AND ENVIRONMENTAL (SHE)
			• Go through documentation with learners and discuss whether al processes were completed correctly, and where problems occurred.

Week
5-6
	Demonstrate basic knowledge of hydraulic components and their application	• Demonstrate basic knowledge of hydraulic components and their application.
		  • Identify components by name and explain their uses.
		  • Explain the purpose of the components in relation to the hydraulic circuit.
		  • Identify differences in component types and explain in relation to the method of functioning.
			• Explain the basic principle of hydraulics, by using a pair of syringes, water and some transparent tubing.
			• Use pictures or a computer generated diagram that shows the internal workings of the master cylinder, wheel cylinders and brake callipers.
			• Point out the master cylinder on an actual vehicle and explain how it works
			• Point out the wheel cylinders on an actual vehicle and explain how it works
			• Point out the brake callipers on the actual vehicle and explain how they work.
			• Explain the purpose of brake fluid in the system
			• Explain the properties and hazards of brake fluid.

		• Describe safety aspects related to hydraulic systems
		  • Explain consequences of pressure in hydraulic system in relation to personal safety.
		  • Explain the effects of hydraulic fluids in terms of safety, health and environmental requirements.
			• Explain what happens when brake fluid comes in contact with automotive paint.
			• Explain the risk of brake fluid coming in contact with skin and eyes.
			• Explain first-aid action if brake fluid cone in contact with skin, eyes or is swallowed.
			• Explain the environmental hazards that brake fluid poses when spilled or disposed of in appropriately.
			•

Week
7-8
	Perform basic welding/joining of metals	• Prepare for work activity.
		  • Prepare for work activity by reading job instructions to determine sequence of operations.
		  • Select the required heat related welding/joining equipment and consumables.
		  • Carry out the pre-operational checks on equipment correctly.
		  • Report on the unsafe or worn parts or defective equipment or potential hazards in the required format.
		  • Prepare materials for welding/joining.
		  • Use special personal protective equipment during the operation.
			• Explain safety issues when using electricity
			• Explain danger of arc eyes
			• Explain danger of burning while welding
			• Discuss type of welding to be used
			• Discuss type of metals that can or cannot be welded / joined.
			• Discuss types of welding rods to be used for certain metals
			• Discuss the preparation of the materials for welding and joining

		• Weld / join metals
		  • Prepare the work area for welding/joining process.
		  • Secure the work area.
		  • Use an appropriate weld/join process.
		  • Weld/join the metal correctly to give a good quality finish.
			• Explain why it is important to prepare the work area before starting the welding process
			• Demonstrate how the welding process should be conducted, by doing it while learners are observing
			• Let the learner do the process himself while being closely observed by the teacher
			• Let learner do the preparation and welding / joining process by himself

		• Apply quality checks on completed weld/joint
		  • Clean the weld/join correctly.
		  • Conduct visual checks for quality finishes at the end of the process.
			• Show learners how a good weld / joint should look
			• Show learners what defect should be checked for after a weld / joint is completed
			• Discuss the causes of defect in a weld or a joint

		• Perform finishing activities
		  • Dispose of scrap material according to organisational procedure.
		  • Store surplus materials according to organisational procedure.
		  • Clean and store equipment according to organisational procedure.
			• Discuss the proper storage and disposal of material

		• Report out of compliance or un-safe conditions while working ○ Report problems with materials and equipment.	• Discuss problems that should be checked for in welding equipment
9 – 10	Formal Assessment	The weeks allocated for formal assessment are integrated across the weeks planned for teaching and learning. The assessment will consist of Practical Task/s with a 75% weighting and a Theory test with a 25% weighting.	
Activity 1: Demonstration 25% **Activity 2**: Practical 50% **Activity 3** Test Respond to questions Pen and paper (Oral or written) 25%			

Year 4 Term 4

WEEK	TOPIC	CONTENT Revision and consolidation:	Techniques, activities, resources and process notes
1	Safety Hand tools HIV / AIDS Engineering measuring equipment Power tools	• Demonstrate safety practise in the workshop • Use and care of hand tools • Understand and deal with HIV / AIDS • Use and care of engineering measuring equipment • Use and care of power tools	• **Demonstrate safety practise in the workshop** • Verbal discussion of the reasons for safety measures in the workshop. • Discuss types of fires. • Demonstrate how fire equipment works. • Use posters to reinforce safety measures. • Use posters and or digital media to show the importance of personal safety. • Show practical examples of unsafe acts or conditions that must be identified in the workshop • **Use and care of hand tools** • Test prior knowledge of hand tools, show actual tool, let learner handle the actual tool, ask learner to name the tools, give the correct name. • Demonstrate how a tool should be used correctly, using actual tool. • Demonstrate how to care for hand tools. • Text books can be used. • Pictures and video can be used

			• **Understand and deal with HIV / AIDS** • Identify and discuss how to handle a person with HIV/AIDS during an accident or injury. • "Explain the rights and responsibilities of employees in the workplace with regard to HIV / AIDS" • Use poster, slide show or Discuss • **Use and care of engineering measuring equipme**nt • Discuss types of basic measurement units, where each is used and each ones symbol. • Use posters and digital media. • Show learner, the actual instrument, let them handle it. • Now demonstrate how to use the actual Instrument. Assist learners in using the measuring instrument themselves • Let learner use the measuring instrument tool himself. • Discuss care and maintain of measuring instrument equipment. • **Use and care of power tools** • Test prior knowledge of hand tools, show actual tool, let learner handle the actual tool, ask learner to name the tools, give the correct name. • Demonstrate how a tool should be used correctly, using actual tool. • Demonstrate how to care for hand tools.

			• Text books can be used. • Pictures and video can be used • Recap
2	Vehicle lifting equipment Automotive batteries Lubrication Engine technology	• Use vehicle lifting equipment • Identify and maintain automotive batteries • Lubrication vehicle components • Explain fundamentals engine technology	• **Use vehicle lifting equipment** • Test prior knowledge of automobile lifting equipment, show actual equipment; ask learner to name and use the equipment • Demonstrate how the equipment should be used correctly, using actual equipment in the work place. • Verbal discussion on the uses of uses of lifting equipment. • Hands on identification of components. • Verbal discussion of safety when using lifting equipment. • Verbal explanation of the correct use of lifting equipment • Verbal test can be used with a check list, to document results. • Formal pen and paper exam can also be used • **Identify and maintain automotive batteries** • Discuss verbally the condition of the battery, and what the signs of damage are. Pictures or examples of damaged batteries can be shown. • Explain why, and what protective equipment should be used when removing a battery or replacing it. • A verbal or pen and paper test can follow

			• **Lubrication vehicle components** • Discuss preparation of the work area needed for an inspection and lubrication. • Discuss preparation of the automotive system for an inspection and lubrication. • Discuss how to select appropriate lubricants according to manual. • Discuss why specific tools were selected, and how they will be used in the process. • Discuss why it is necessary to service a vehicle • Discuss service intervals, on different vehicles • Demonstrate the correct way to drain the oil • Demonstrate how to remove the oil filter • Demonstrate how to fit the new filter • Demonstrate how to replace and tighten the oil drain plug correctly • Demonstrate how to refill the oil to the correct level without spilling • Discuss the correct way to dispose of used oil and oil filter according to SAFETY, HEALTH AND ENVIRONMENTAL (SHE) law. • Discuss the causes of leaks. • Discuss the consequences of a leak and let learners discuss what would happen if it was left un attended. • If a leak is found discuss what causes it, and what can be done to rectify it. • Evaluate whether materials were disposed of in accordance with SAFETY, HEALTH AND ENVIRONMENTAL (SHE) • **Explain fundamentals engine technology** • Use pictures or video, but if possible the actual engine, to demonstrate differences. • Operation can be explained best by using computer simulations of the internal working of each type of engine. • Use picture of engine parts with their correct names and purpose in- side the engine • Also mention and discuss the materials each which are made of

			• If possible, obtain the real parts for learners to see and handle • Practical verbal tests can be carried out by showing a part to learners and asking them to give the name, or giving the name and learners must point out the correct part • Show pictures or computer images of different engine designs (inline engine, v- engine, horizontal engine, radial engine) • Also show engines with different number of cylinders. • Discuss engine capacity and how it is calculated • Discuss valve and camshaft layouts like side valve, overhead valve, single overhead cam, double overhead cam, multivalve and cross flow engines • Discuss the advantages and dis advantages of each. • Discuss where they are most commonly used • The real car or pictures can be used • Discuss the different types of cooling • Show the cooling the cooling system, and the all its components • Discuss the function of each component • Discuss different type of lubrication systems • Show the lubrication system, and all its parts • Discuss the function of each component • Show the fuel supply system, and all its components • Discuss the different fuel supply systems used • All learners will be subjected to a pen and paper test. • Discuss • Show posters • Use actual components /tools and demonstrate • Recap

3	Automotive components Mechanical components and Servicing	• Remove and fit automotive components • Carry out an automotive service	• **Remove and fit automotive components** • Discuss the component to be removed, where it is situated on the vehicle, if it is necessary to put the to put the vehicle on a lift or jack it up to reach the component are there any other parts that needs to be removed before the component can be reached • Discuss whether will be any chance oil or coolant spilling in the process, prepare the work area accordingly if there is • Discuss the tools that will be needed to complete the task, make sure that they are available • Discuss whether the component to be removed will be replaced or can be repaired, or will have to be sent away to be repaired or re-engineered • Demonstrate how to remove the component while learners observe • Evaluate learners by completing a checklist while they complete the task • Discuss what defects or problems could be encountered when removing and fitting the component. • Reflect on the safety measures that were employed during work process. • Discuss what precautions were taken to prevent damage to the vehicle, component or injuries to the person. • Reflect on the safety measures that were employed during work process. • **Carry out an automotive service** • Discuss where to obtain necessary data and specifications of the car that is to be serviced. • Demonstrate how to use a data book or a computer to obtain part numbers on oil filters, petrol filters, air cleaner and spark plugs.

			• Also obtain the type and amount of oil needed. • Discuss the tools needed to complete the service. • Collect the tools and place them at hand. • Check replacement parts to make sure that they were supplied correctly to commence with the service • Discuss the consequence to the car if a service is not completed correctly. • Discuss why it is necessary to service a vehicle. • Discuss service intervals, on different vehicles. • Demonstrate the correct way to drain the oil. • Demonstrate how to remove the oil filter • Demonstrate how to fit a new filter. • Demonstrate how to replace and tighten the oil drain plug correctly. • Demonstrate how to refill the oil to the correct level without spilling. • Discuss the correct way to dispose of used oil and oil filter according to SAFETY HEALTH AND ENVIRONMENTAL (SHE) law • Demonstrate how to remove the air cleaner. • Inspect the old air cleaner and discuss the consequences of driving with a dirty air cleaner. • Demonstrate the correct way to fit the new air cleaner. • Demonstrate the correct way to remove the petrol filter. • Employ SAFETY HEALTH AND ENVIRONMENTAL (SHE) to correct way to dispose of old petrol filters and spilled petrol. • Demonstrate how to fit the new filter. • Discuss the dangers of driving with dirty petrol filter. • Discuss where contaminants come from that are found in the petrol filter. • Discuss different types of spark plugs and what the

			number on a spark plug means. (BP6ES) • Demonstrate the correct way, and order in which the spark plugs should be removed. • Demonstrate how to set the spark plug gap according to the manufacturer's specification by using a spark plug gauge or a feeler gauge. • Demonstrate how to fit the new spark plugs, and tighten them correctly. • Discuss the consequences of driving with old worn spark plugs. • The car is started and general running is assessed. • Check oil pressure. • Check oil filter, petrol filter and sump plug for any leaks. • Now learners take turns in doing each of steps under supervision. • Each learner is being assessed while he is performing each of the steps. • Make use of a check list • Use a check list and give learner a chance to inspect the vehicle after the service for leaks, fluid level, and general running condition. • Learners complete a pen and paper test. • Discuss and demonstrate how and why it is important to dispose of used oil and other fluids in the correct manner, environmentally and by law as stipulated by SAFETY HEALTH AND ENVIRONMENTAL (SHE). • Demonstrate the advantages of working in a clean neat environment. • Discuss the health and safety hazards caused by a dirty work place. • Discuss the environmental impact. • Use a checklist to asses if learner followed procedures satisfactorily.

			• Demonstrate how to complete a job card and other documents correctly. • Discuss • Show posters • Use actual components /tools and demonstrate • Perform actual task in short • Recap
4	Inspection and lubrication Basic hydraulic components Basic welding / joining of metals	• Inspection and lubrication • Identify and repair basic hydraulic components • Use basic welding / joining of metal to repair components	• **Inspection and lubrication** • Discuss why it is necessary to service a vehicle. • Discuss service intervals, on different vehicles. • Demonstrate the correct way to drain the oil. • Demonstrate how to remove the oil filter • Demonstrate how to fit a new filter. • Demonstrate how to replace and tighten the oil drain plug correctly. • Demonstrate how to refill the oil to the correct level without spilling. • Discuss the correct way to dispose of used oil and oil filter according to SAFETY HEALTH AND ENVIRONMENTAL (SHE) law. • Now learners take turns in doing each of steps under supervision. • Each learner is being assessed while he is performing each of the steps. Make use of a check list • Discuss why it is necessary to service a vehicle • Discuss service intervals, on different vehicles

			• Demonstrate the correct way to drain the oil • Demonstrate how to remove the oil filter • Demonstrate how to fit the new filter • Demonstrate how to replace and tighten the oil drain plug correctly • Demonstrate how to refill the oil to the correct level without spilling • Discuss the correct way to dispose of used oil and oil filter according to SAFETY, HEALTH AND ENVIRONMENTAL (SHE) law. • Now learners take turn in doing each of steps under supervision. • Each learner is being assessed while he is performing each of the steps. • Make use of a check list. o Discuss the causes of leaks. o Discuss where leaks occur most of the time, and point them out on the vehicle. o Let learners check the mentioned places for leaks and report back on their findings. o Discuss the consequences of an leak and let learners discuss what would happen if it was left un attended. o If a leak is found discuss what causes it, and what can be done to rectify it. Remind learners of how the work area should be restored after work is finished. o Let learners restore work area, put away the tools, and clean the work area. A score sheet can be kept for evaluation. o Evaluate whether materials were disposed of in accordance with SAFETY, HEALTH AND

			ENVIRONMENTAL (SHE) o Go through documentation with learners and discuss whether al processes were completed correctly, and where problems occurred. • **Identify and repair basic hydraulic components** • Explain the basic principle of hydraulics, by using a pair of syringes, water and some transparent tubing. • Use pictures or a computer generated diagram that shows the internal workings of the master cylinder, wheel cylinders and brake callipers. • Point out the master cylinder on an actual vehicle and explain how it works • Point out the wheel cylinders on an actual vehicle and explain how it works • Point out the brake callipers on the actual vehicle and explain how they work. • Explain the purpose of brake fluid in the system • Explain the properties and hazards of brake fluid. • Explain what happens when brake fluid comes in contact with automotive paint. • Explain the risk of brake fluid coming in contact with skin and eyes. • Explain first-aid action if brake fluid cone in contact with skin, eyes or is swallowed. • Explain the environmental hazards that brake fluid poses when spilled or disposed of in appropriately. Discuss • Show posters

			• Use actual components /tools and demonstrate • Perform actual task in short • Recap • **Use basic welding / joining of metal to repair components** • Explain safety issues when using electricity • Explain danger of arc eyes • Explain danger of burning while welding • Discuss type of welding to be used • Discuss type of metals that can or cannot be welded / joined. • Discuss types of welding rods to be used for certain metals • Discuss the preparation of the materials for welding and joining • Explain why it is important to prepare the work area before starting the welding process • Demonstrate how the welding process should be conducted, by doing it while learners are observing • Let the learner do the process himself while being closely observed by the teacher • Let learner do the preparation and welding / joining process by himself • Show learners how a good weld / joint should look • Show learners what defect should be checked for after a weld / joint is completed • Discuss the causes of defect in a weld or a joint

			• Discuss the proper storage and disposal of material o Discuss problems that should be checked for in welding equipment
5-10	External Examination	External moderation of school assessment over terms 1, 2 and 3 = 50% of qualification Complete external Practical Assessment Task (PAT) = 25% of qualification Formal external Examination written or oral = 25% of qualification	

SECTION 4

ASSESSMENT

4.1 Introduction

This section on assessment *standardises* the recording and reporting processes for the Technical Occupational Curriculum and Assessment Policy Statement that is offered in schools that offer this learning programme. It also provides a policy framework for the management of school based assessment and school assessment records.

It is critically required of teachers to offer all measures of differentiated assessment as outlined in Chapter 9 of the National Protocol for Assessment. Especially learners in special schools who follow the Technical Occupational Curriculum over a period of four years have diverse learning styles and support needs. Since a learner or learners may be functioning on different levels, the assessment / recording / reporting system must make provision to reflect the level(s) of each leaner. Each learner, regardless of his/her number of years in the school, must have access to the standard of assessment best suited to his/her needs. The learner's *abilities* determine what will be expected of him/her and the *pacing* of instruction must accommodate each individual learner within a framework of high expectations (See Chapter 9 of the National Protocol for Assessment).

Learners are also eligible for Accommodations and Concessions as outlined in the Standard Operating Procedures for the Assessment of Learners who Experience Barriers to Assessment from Grade R to 12 (2017).

All decisions related to differentiated assessment are made through completing the protocols as outlined in the Policy on Screening, Identification, Assessment and Support (2014) and recorded and tracked through the Individual Support Plans of learners.

4.2 Assessment Principles

4.2.1 Definition

Assessment is a continuous planned process of identifying, gathering and interpreting information about the performance of learners, using various forms of assessment. It involves four steps: generating and collecting evidence of achievement; evaluating this evidence; recording the findings and using this information to understand and thereby assist the learner's development in order to improve the process of learning and teaching. Assessment should be both informal (Assessment for Learning) and formal (Assessment of Learning). In both cases regular feedback should be provided to learners to enhance the learning experience.

Assessment is a process that measures individual learners' attainment of knowledge (content and concepts) and skills by collecting, analysing and interpreting the data and information obtained from this process to:

- Enable the teacher to judge a learner's progress in a reliable way;
- Inform learners of their strengths, weaknesses and progress; and
- Assist teachers, parents and other stakeholders in making decisions about the learning process and the progress of learners.

Assessment should be mapped against the content, skills, intended aims and topics specified in the learning programme. In both informal and formal assessments, it is important to ensure that in the course of a school year:

- All of the topics and content are covered;
- The full range of skills is included; and
- A variety of different forms of assessment are used.

4.2.2 Informal Assessment or Daily Assessment

Assessment for learning has the purpose of continuously collecting information on a learner's achievement that can be used to improve their learning. Informal assessment is a daily monitoring of learners' progress. This is done through observations, discussions, practical demonstrations, learner-teacher conferences, informal classroom interactions, etc. Informal assessment may be as simple as stopping during the lesson to observe learners or to discuss with learners how learning is progressing. Informal assessment should be used to provide feedback to the learners and to inform planning for teaching, but need not be recorded. It should not be seen as separate from learning activities taking place in the classroom. Learners or teachers can assess their performance in the tasks. Self-assessment and peer assessment actively involves learners in assessment. This is important as it allows learners to learn from and reflect on their own performance. The results of the informal daily assessment tasks are not formally recorded unless the teacher wishes to do so. **The results of daily, informal assessment tasks are not taken into account for progression, promotion and certification purposes.**

Informal, on-going assessments should be used to scaffold the acquisition of knowledge and skills and should be the stepping stones leading up to the formal tasks in the Programmes of Assessment.

4.2.3 Formal Assessment

All assessment tasks that make up a formal programme of assessment for the year are regarded as Formal Assessment. Formal Assessment Tasks are marked and formally recorded by the

teacher for progression and certification purposes. All Formal Assessment Tasks are subject to moderation for the purpose of quality assurance and to ensure that appropriate standards are maintained. Formal assessment tasks form part of a year-long formal Programme of Assessment.

a. Why use a Formal Assessment task?

"Formal Assessment Task (assessment of learning)" – is a systematic way of assessment used by teachers to determine how well learners are progressing in a level and in a particular subject.

b. What is a Formal Assessment Task?

It is a set of questions and or instructions that learners need to respond to. A task may consist of a range of activities. A formal task must be valid, fair and reliable and must cover sufficient knowledge and or skills to report on the learners' progress.

Teachers must ensure that assessment criteria are very clear to the learners before the assessment process commences. This involves explaining to the learners which knowledge and skills are being assessed and the required length of responses. Feedback should be provided to the learners after assessment and could take the form of whole-class discussion or teacher-learner interaction. Examples of formal assessments include projects, oral presentations, simulations, performances, tests, examinations, practical demonstrations, etc. The **forms of assessment** used should be appropriate to the age and the developmental level of the learners as well as the context of the subject or skills being assessed. The assessment tasks should be carefully designed to cover the topic, content and or skills of the subject. The design of these tasks should therefore ensure that a variety of skills are assessed.

Practical Assessment Tasks allow for learners to be assessed on a regular basis during the school year and also allow for the assessment of skills that cannot be assessed in a written format, e.g. test or examination.

Assessment in the General Certificate of Education: Technical Occupational (GCE: TO)

Assessment in the GCE: TO is underpinned by the objectives of the National Qualifications Framework (NQF). These objectives are to:

- Create an integrated national framework for learning achievements.
- Facilitate access to and progression within education, training and career paths.
- Enhance the quality of education and training.

- Redress unfair discrimination and past imbalances and thereby accelerate employment opportunities.
- Contribute to the holistic development of the learner by addressing:
  - Social adjustment and responsibility;
  - Moral accountability and ethical work orientation;
  - Economic participation; and
  - Nation-building.

The principles that drive these objectives are:

- ***Integration***

  To adopt a unified approach to education and training that will strengthen the human resources development capacity of the nation.

- ***Relevance***

  To be dynamic and responsive to national development needs.

- ***Credibility***

  To demonstrate national and international values and acquired competencies and skills so as to ensure the recognition of the qualification to be attained.

- ***Coherence***

  To work within a consistent framework of principles and certification.

- ***Flexibility***

  To allow for creativity and resourcefulness when achieving skills to cater for different learning styles and use a range of assessment methods, instruments and techniques.

- ***Participation***

  To enable stakeholders to participate in setting standards and co-ordinating the achievement of the qualification.

- ***Access***

  To address barriers to learning at each level to facilitate learners' progress.

- ***Progression***

  To ensure that the qualification framework permits individuals to move through the levels of the national qualification via different, appropriate combinations of the components of the delivery system.

- ***Portability***

  To enable learners to transfer parts of a qualification from one learning institution and/or employer to another institution or employer.

- ***Articulation***

  To allow for vertical and horizontal mobility in the education system when pre-requisites for accreditation have been successfully completed.

- ***Recognition of Prior Learning***

  To grant credits for a unit of learning following an assessment or if a learner possesses the capabilities specified in each skills area.

- ***Validity of assessments***

  To ensure assessment covers a broad range of knowledge, skills, values and attitudes (SKVAs) needed to demonstrate applied competency. This is achieved through:

  - Clearly stating the skill to be assessed;
  - Selecting the appropriate or suitable evidence;
  - Matching the evidence with a compatible or appropriate method of assessment; and
  - Selecting and constructing an instrument(s) of assessment.

- ***Reliability***

  To assure assessment practices are consistent so that the same result or judgment is arrived at if the assessment is replicated in the same context. This demands consistency in the interpretation of evidence; therefore, careful monitoring of assessment is vital.

- ***Fairness and transparency***

  To verify that no assessment process or method(s) hinders or unfairly advantages any learner. The following could constitute unfairness in assessment:

  - Inequality of opportunities, resources or teaching and learning approaches;
  - Bias based on ethnicity, race, gender, age, disability or social class;
  - Lack of clarity regarding topic, content or skill being assessed; and
  - Comparison of learner's work with that of other learners, based on learning styles and language.

- ***Practicability and cost-effectiveness***

  To integrate assessment practices within the teaching and learning process and strive for cost and time-effective assessment.

4.3 Managing Assessment

Assessor Requirements

Assessors must be subject specialists with adequate formal assessment experience. If the teacher conducting the assessments has not been declared a competent assessor, an assessor who has been declared competent may be appointed to oversee the assessment process to ensure the quality and integrity of assessments for the qualification.

Types of Assessment

Assessment benefits the learner and the teacher. It informs learners about their progress and helps teachers make informed decisions at different stages of the learning process. Depending on the intended purpose, different types of assessment can be used.

- **Baseline assessment:** At the beginning of a level or learning experience, baseline assessment establishes the knowledge, skills, values and attitudes (SKVAs) that learners bring to the classroom. This knowledge assists teachers to plan learning programmes and learning activities.

- **Diagnostic assessment:** This assessment diagnoses the nature and causes of barriers to learning experienced by specific learners. It is followed by guidance, appropriate support and intervention strategies. This type of assessment is useful to make referrals for learners requiring specialist help.

- **Formative assessment (Informal Assessment):** This assessment monitors and supports teaching and learning. It determines learners' strengths and weaknesses and provides feedback on progress. It determines if a learner is ready for summative assessment.

- **Summative assessment (Formal Assessment)** This type of assessment gives an overall picture of student progress at a given time. It determines whether the student is sufficiently competent to progress to the next level.

Planning Assessment

An assessment plan should cover three main processes:

- **Collecting evidence:** The assessment plan indicates which learning programme topics, content and skills will be assessed, what assessment method or activity will be used and when this assessment will be conducted.

- **Recording:** The process of recording refers to the assessment instruments or tools with which the assessment will be captured or recorded. Therefore, appropriate assessment instruments must be developed or adapted.

- **Reporting:** All the evidence is put together in a report to deliver a decision for the subject.

Methods of Assessment

Methods of assessment refer to who carries out the assessment and includes teacher assessment, self-assessment, peer assessment and group assessment.

TEACHER ASSESSMENT	The Teacher assesses learners' performance against given criteria in different contexts, such as individual work, group work, etc.
SELF-ASSESSMENT	Learners assess their own performance against given criteria in different contexts, such as individual work, group work, etc.
PEER ASSESSMENT	Learners assess another student or group of learners' performance against given criteria in different contexts, such as individual work, group work, etc.
GROUP ASSESSMENT	Learners assess the individual performance of other learners within a group or the overall performance of a group of learners against given criteria.

Task lists and **checklists** show the learners what needs to be done. They consist of short statements describing the expected performance in a particular task. The statements on the checklist can be ticked off when the learner has adequately achieved the criterion. Checklists and task lists are useful in peer or group assessment activities.

Rubrics are a hierarchy (graded levels) of criteria with benchmarks that describe the minimum level of acceptable performance or achievement for each criterion. It is a different way of assessment and cannot be compared to tests. Each criterion described in the rubric must be assessed separately. Mainly, two types of rubrics, namely holistic and analytical, are used.

Competence Descriptions

All assessment should award marks to evaluate specific assessment tasks. However, marks should be awarded against rubrics and not simply be a total of ticks for right answers. Rubrics should explain the competence level descriptors for the skills, knowledge, values and attitudes (SKVAs) a learner must demonstrate to achieve each level of the rating scale. When teachers or assessors prepare an assessment task or question, they must ensure that the task or question addresses an aspect of a topic or skill. The relevant content must be used to create the rubric to assess the task or question. The descriptions must clearly indicate the minimum level of attainment for each category on the rating scale.

Strategies for Collecting Evidence

A number of different assessment instruments may be used to collect and record evidence. Examples of instruments that can be (adapted and) used in the classroom include:

Record sheets: The teacher observes learners working in a group. These observations are recorded in a summary table at the end of each task. The teacher can design a record sheet to observe learners' interactive and problem-solving skills, attitudes towards group work and involvement in a group activity.

Checklists: Checklists should have clear categories to ensure that the objectives are effectively met. The categories should describe how the activities are evaluated and against what criteria they are evaluated. Space for comments is essential.

School Assessment Programme

The **Programme of Assessment** is designed to spread formal assessment tasks in all subjects in a school across a term.

The programme of assessment should be recorded in the Teacher's planning file (Portfolio of Assessment) for each subject.

The following should at least be included in the Teacher's File:

- A contents page;
- The formal schedule of assessment;
- The requirements for each assessment task;
- The tools used for each assessment task;
- Recording instrument(s) for each assessment task; and
- A mark sheet and report for each assessment task.

The learner's Evidence of Performance must at least include:

- A contents page;
- The assessment tasks according to the assessment programme as indicated below;
- The assessment tools or instruments for the task; and
- A record of the marks (and comments) achieved for each task.

Where tasks cannot be contained as evidence in the Portfolio of Evidence (PoE), its exact location must be recorded and it must be readily available for moderation purposes.

Assessment across the four years

Year 1 Reporting only in the term when the skill is done.

The GCE Technical Occupational Qualification at NQF Level 1 is a four-year Learning Programme. In year one a learner is exposed to a number of Occupational Subjects. Each subject is offered over a ten-week period (one term) in Year 1, where the learner is exposed to the basic skills required for the subject. By the end of year 1 the learner will select a minimum of one skill for the qualification.

Year 1	**Formal School-Based Assessments**
	Learner performance in the Term:
	Practical 75% *
	Theory (Test) 25%
Term Report	100%

Years 2 and 3

Year 2 will focus on a broad overview of the subject with a basic understanding and mastery of some of the basic skills required in the subject. Year 3 will focus on the consolidation of the basic skills and the addition of more advanced skills. Learners must in Year 3 start to develop a greater degree of independent mastery of the subject skills

Year 2/3	**Formal School-Based Assessments**			**Final End-of-Year Assessments**
	Term 1	Term 2	Term 3	Term 4
	Practical 75% *	Practical 75% *	Practical 75% *	○ Practical 75%
	Theory (Test) 25%	Theory (Examination) 25%	Theory (Test) 25%	
				○ (Oral or written) Examination 25%
Term Report	100%	100%	100%	
End of Year	SBA 75%			25%

Year 4 Qualification year

In year 4 the focus shifts to the World of Work. Learners must consolidate required skills for the qualification and may engage in workplace exposure for a short period of time during the fourth year. Learners develop independent mastery of skills to be competent within the workplace

<table>
<tr><td rowspan="4">Year 4</td><td colspan="3">Formal School-Based Assessments</td><td>Final End-of-Year Assessments</td></tr>
<tr><td>Term 1</td><td>Term 2</td><td>Term 3</td><td>Term 4</td></tr>
<tr><td>Practical 75% *
Theory (Test)
25%</td><td>Practical 75% *
Theory (Examination)
25%</td><td>Practical 75% *
Theory (Test)
25%</td><td>External Practical Assessment Task
25%</td></tr>
<tr><td></td><td></td><td></td><td rowspan="2">External
Oral or written
Examination
25%</td></tr>
<tr><td>Term Report</td><td>100%</td><td>100%</td><td>100%</td></tr>
<tr><td>End of Year</td><td colspan="3">SBA
50%</td><td>External Examinations
50%</td></tr>
</table>

CLARIFICATION ON ASSESSMENT PERIODS

Year 2 and 3:

Term 1 theory assessment to consist of work done in term 1 only

Term 2 theory assessment to consist of work done in terms 1 and 2

Term 3 theory assessment to consist of work done in term 3 only

Term 4 theory assessment to consist of work done in terms 3 and 4

Year 4:

Term 1 theory assessment to consist of work done in term 1 only

Term 2 theory assessment to consist of work done in terms 1 and 2

Term 3 theory assessment to consist of work done in terms 1, 2 and 3

Term 4 Theory completed in the year

4.5.2 Timing of formal assessment

Suggested Program of Assessment for Motor Mechanics

YEAR 1					
Term	**Content/ concept/skill**	**Activities**	**Forms of Assessment**	**%**	**FATs based on activities in CAPS: TO**
	1. Keep the work area safe and productive 2. First Aid: Understand and deal with HIV/AIDS 3. Select and use hand tools 4. Select, use and care for measuring equipment 5. Select, use and care for power tools	Activity 1 Demonstration	Demonstration	25%	FAT 1
		Activity 2	Practical	50%	
		Activity 3 Respond to questions	Pen and paper test (Oral or written)	25%	

YEAR 2					
Term	**Content/ concept/skill**	**Activities**	**Forms of Assessment**	**%**	**FATs based on activities in CAPS: TO**
Term 1	1. Keep the work area safe and productive 2. First Aid: Understand and deal with HIV/AIDS 3. Select and use hand tools 4. Select, use and care for measuring equipment 5. Select, use and care for power tools	Activity 1 Demonstration	Demonstration	25%	FAT 1
		Activity 2	Practical	50%	
		Activity 3 Respond to questions	Pen and paper test (Oral or written)	25%	

Term	Content/ concept/skill	Activities	Forms of Assessment	%	FATs based on activities in CAPS: TO
Term 2	1. Select and use vehicle lifting equipment 2. Service automobile batteries 3. Demonstrate knowledge of lubrication 4. Understand the fundamentals of engine technology	Activity 1 Demonstration	Demonstration	25%	FAT 2
		Activity 2	Practical	50%	
		Activity 3 Respond to questions	Pen and paper Examination (Oral or written)	25%	
Term 3	1. Carry out an automotive service	Activity 1 Demonstration	Demonstration	25%	FAT 3
		Activity 2	Practical	50%	
		Activity 3 Respond to questions	Pen and paper test (Oral or written)	25%	
Term 4	1. Inspect and lubricate an automotive system	Activity 1 Demonstration	Demonstration	25%	FAT 4
		Activity 2	Practical	50%	
		Activity 3 Respond to questions	Pen and paper Examination (Oral or written)	25%	

YEAR 3					
Term	**Content/ concept/skill**	**Activities**	**Forms of Assessment**	**%**	**FATs based on activities in CAPS: TO**
Term 1	1. Keep the work area safe and productive 2. Select and use hand tools 3. Select, use and care for measuring equipment 4. Select, use and care for power tools	Activity 1 Demonstration	Demonstration	25%	FAT 1
		Activity 2	Practical	50%	
		Activity 3 Respond to questions	Pen and paper test (Oral or written)	25%	
Term	**Content/ concept/skill**	**Activities**	**Forms of Assessment**	**%**	**FATs based on activities in CAPS: TO**
Term 2	1. Service automobile batteries 2. Demonstrate knowledge of lubrication 3. Understand the fundamentals of engine technology	Activity 1 Demonstration	Demonstration	25%	FAT 2
		Activity 2	Practical	50%	
		Activity 3 Respond to questions	Pen and paper Examination (Oral or written)	25%	

YEAR 3					
Term	**Content/ concept/skill**	**Activities**	**Forms of Assessment**	**%**	**FATs based on activities in CAPS: TO**
Term 3	1. Remove and fit automobile components 2. Assemble mechanical components 3. Carry out an automotive service 4. Inspect and lubricate an automotive system	Activity 1 Demonstration	Demonstration	25%	FAT 3
		Activity 2	Practical	50%	
		Activity 3 Respond to questions	Pen and paper test (Oral or written)	25%	
Term	**Content/ concept/skill**	**Activities**	**Forms of Assessment**	**%**	**FATs based on activities in CAPS: TO**
Term 4	1. Demonstrate basic knowledge 2. Perform basic welding/joining of metals	Activity 1 Demonstration	Demonstration	25%	FAT 4
		Activity 2	Practical	50%	
		Activity 3 Respond to questions	Pen and paper Examination (Oral or written)	25%	

YEAR 4					
Term	**Content/ concept/skill**	**Activities**	**Forms of Assessment**	**%**	**FATs based on activities in CAPS:TO**
Term 1	1. Keep the work area safe and productive 2. Select and use hand tools 3. Select, use and care for measuring equipment 4. Select, use and care for power tools	Activity 1 Demonstration	Demonstration	25%	FAT 1
		Activity 2	Practical	50%	
		Activity 3 Respond to questions	Pen and paper test (Oral or written)	25%	
Term	**Content/ concept/skill**	**Activities**	**Forms of Assessment**	**%**	**FATs based on activities in CAPS: TO**
Term 2	1. Service automobile batteries 2. Demonstrate knowledge of lubrication 3. Understand the fundamentals of engine technology	Activity 1 Demonstration	Demonstration	25%	FAT 2
		Activity 2	Practical	50%	
		Activity 3 Respond to questions	Pen and paper Examination (Oral or written)	25%	

YEAR 4

Term	Content/ concept/skill	Activities	Forms of Assessment	%	FATs based on activities in CAPS: TO
Term 3	1. Remove and fit automobile components 2. Assemble mechanical components 3. Carry out an automotive service 4. Inspect and lubricate an automotive system 5. Demonstrate basic knowledge of hydraulic components 6. Perform basic welding/joining of metals	Activity 1 Demonstration	Demonstration	25%	FAT 3
		Activity 2	Practical	50%	
		Activity 3 Respond to questions	Pen and paper test (Oral or written)	25%	

Term	Content/ concept/skill	Activities	Forms of Assessment	%	FATs based on activities in CAPS: TO
Term 4	Core content and Concept across the years	External moderation of school assessment over terms 1, 2 and 3.		50%	GCE: TO Qualification
		Activity 1 Practical	Formal External Practical Assessment Task	25%	
		Activity 2 Respond to questions	Formal External assessment: Examination (Written or oral)	25%	

Recording and Reporting

Recording is a process in which the teacher documents the level of a learner's performance in a specific assessment task. It indicates learner progress towards the achievement of the knowledge and skill. Records of learner performance should provide evidence of the learner's progression. Records of learner performance should also be used to verify the progress made by teachers and learners in the teaching and learning process. Reporting is a process of communicating learner performance to learners, parents, schools, and other stakeholders. Learner performance can be reported in a number of ways. These include report cards, parents' meetings, school visitation days, parent-teacher conferences, phone calls, letters, class or school newsletters, etc.

Good record keeping is essential in all assessment, particularly in continuous assessment. A record book or file must be kept up to date by each teacher. It should contain:

- Learners' names;
- Dates of assessment;
- Name and description of the assessment activity;
- The results of assessment activities, according to Subject; and
- Comments for support purposes.

Teachers report in percentages against the subject. The various achievement levels and their corresponding percentage bands are as shown in the table below. Recording is a process in which the teacher documents the level of a learner's performance. Teachers record the actual raw marks against the task using a record sheet. Records of learner performance should also be used to verify the progress made by teachers and learners in the teaching and learning process. Records should be used to monitor learning and to plan ahead.

Note: The seven-point scale should have clear descriptions that give detailed information for each level. Teachers will record actual marks against the task by using a record sheet; and report percentages against the subject on the learners' report cards.

Codes and percentages for reporting

Rating code	Description of competence	Percentage	Nature of support provided to learners
7	Outstanding achievement	80 – 100	Independent
6	Meritorious achievement	70 – 79	Independent, verbal cues needed
5	Substantial achievement	60 – 69	Minimum support
4	Adequate achievement	50 – 59	Moderate support
3	Moderate achievement	40 – 49	Maximum support (Physical / Verbal)
2	Elementary achievement	30 – 39	Goals to be revisited – Change of direction required.
1	Not achieved	0 – 29	Little / no interest shown in the activity despite maximum support

All records must be accessible, easy to interpret, securely kept, confidential and helpful in the teaching and reporting process. The school assessment policy determines the details of how record books must be completed. Schools are required to provide quarterly feedback to parents on the Programme of Assessment, using a formal reporting tool, such as a report card. The schedule and the report card should indicate the overall level of performance of a learner.

NOTE:

Criterion referencing is best used to describe learner's performance in a skill. Teachers must make use of suitable analytical rubrics when assessing a learner's competence for a specific skill using practical demonstrations.

Progression and Promotion:

Learners will progress with age cohort in this Phase (Year 1-4). Where a learner does not meet the minimum requirements to be promoted to the next year then a learner may spend one extra year in the phase (Year 1-4) to strengthen their ability to achieve the qualification.

4.4 Moderation of Assessment

Moderation refers to the process that ensures that the assessment tasks are fair, valid and reliable. Moderation must be implemented at school, district, and provincial levels as required. Comprehensive and appropriate moderation practices must be in place for the quality assurance of all subject assessments. The Formal School Based Assessment and the practical assessment tasks must be moderated by the relevant subject specialists at the district and, if required, provincial levels in consultation with the moderators at school.

Moderation serves five purposes:

1. It must ascertain whether subject content and skills have been sufficiently covered.
2. The moderator must ensure that the correct balance of cognitive demands are reflected in the assessments.
3. The assessments and marking are of an acceptable standard and consistency.
4. The moderator must make judgements about the comparability of learner performance across schools; whilst recognising that teachers teach in different ways.
5. The subject specialist/moderator must identify areas in which a teacher may need development and support and must ensure that this support is provided.

4.4.1 Internal moderation

Assessment must be moderated according to the internal moderation policy of the School, Provincial and National Departments. Moderation is a continuous process. The moderator's involvement starts with the planning of assessment methods and instruments and follows with continuous collaboration with and support to the assessors. Internal moderation creates common understanding of topics and skills and maintains these across the learning programmes.

4.4.2 External moderation

External moderation is conducted by the Districts and or Provincial offices, Department of Basic Education, Umalusi and, where relevant, the QCTO. The external moderator:

- Monitors and evaluates the standard of all summative assessments;
- Maintains standards by exercising appropriate influence and control over assessors;
- Ensures proper procedures are followed;
- Ensures summative integrated assessments are correctly administered;
- Observes a minimum sample of 12 summative assessments in total;

- Gives written feedback to the relevant quality assuror; and
- Moderates in case of a dispute between an assessor and a student.

Policy on inclusive education requires that assessment procedures for students who experience barriers to learning be customised and supported to enable these students to achieve their maximum potential.

Moderation is therefore an on-going process and not a once-off end-of-year event.

4.5 General

This document should be read in conjunction with:

- White Paper 6 on Special Needs Education: Building an Inclusive Education and Training System (2001);
- *National Policy Pertaining to the Programme and Promotion Requirements of the National Curriculum Statement Grades R – 12*; and (NPPPPR) (2011);
- *National Protocol for Assessment Grades R – 12. (NPA) (2011);*
- *Guidelines for Responding to Diversity in the Classroom through the Curriculum and Assessment Policy Statements* (2011);
- *Guidelines to Ensure Quality Education and Support in Special Schools and Special School Resource Centres* (2013);
- *Policy on Screening, Identification, Assessment and Support* (2014);
- *Guidelines for Full-service/Inclusive Schools* (2010); and
- *Standard Operating Procedures for Assessment of Learners who Experience Barriers to Assessment* (2016).

SECTION 5

RESOURCES

Annexure 1: Cover Sheet for Learner Portfolio of Evidence

LEARNER ACTIVITY PRACTICAL/DEMONSTRATION SHEET

NAAM / NAME: _____ KWARTAAL / TERM: _____

Kwitansie nr / Invoice no.	Jaar / Year	Skool / School: _____ Onderwyser / Teacher: _____
Datum begin / Date commenced: _____	Datum voltooi/Date completed _____	Jaar / Year: _____

Vak / Subject: MOTOR MECHANICS		
Projek / Project:		
FASETTE / FACETS	Punte / Marks	Prakties / Practicum
Leerder total / Learner Total		

TAKE A PHOTO OF LEARNER PERFORMING THE SET TASK AND PASTE IT HERE AS EVIDENCE

Gedrag van leerder / Behavior of learner: _____

_____

_____

AUTHENTIFICATION

Designation	Signature	Date
Onderwyser / Signature of Teacher:		
Depart hoof / Signature of Head of Department:		
Hoof / Signature of Principal:		
Vakadviseur / Signature of Subject Advisor:		

Annexure 2 - Exemplar Assessments according to Blooms in levels

Exemplar 1 **LEVEL 3**

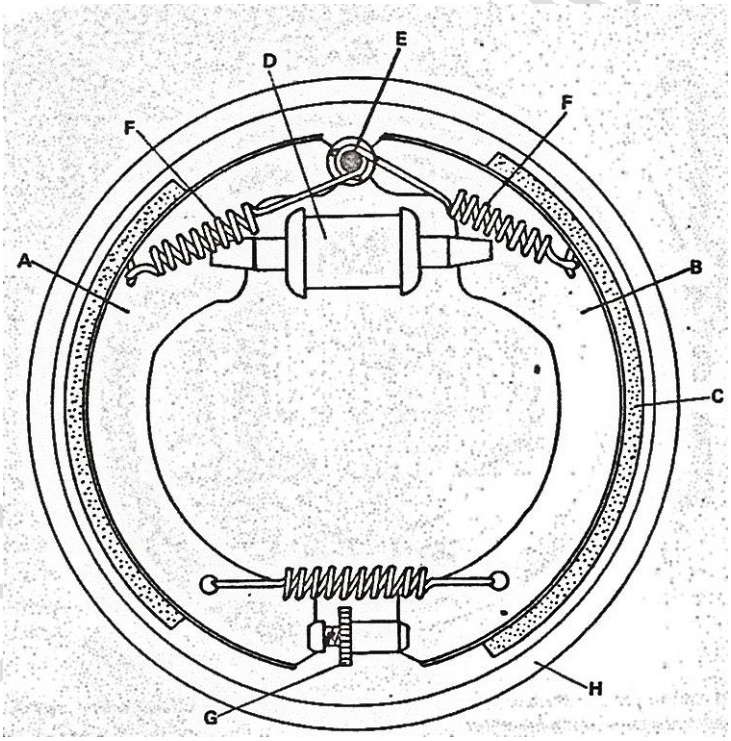
SUBJECT	YEAR 4
TIME ALLOCATION	1 HOUR
DATE	DATE:
EXAMINER	
LEARNER NAME AND SURNAME	
GROUP	YEAR 4_____
MARKS OBTAINED	_____ /50 _____ %

ANSWER ALL THE QUESTIONS ON THE EXAMINATION PAPER

SECTION A: BRAKES

1.1 DRUM BRAKES.

1.1.1. NAME THE PARTS OF THE SYSTEM. WRITE THE AWNSER NEXT TO THE CORESPONDING LETTER IN THE COLLOM BELOW.



PART	NAME
A	
B	
C	
D	
E	
F	
G	
H	

Exemplar 2 **LEVEL 2**

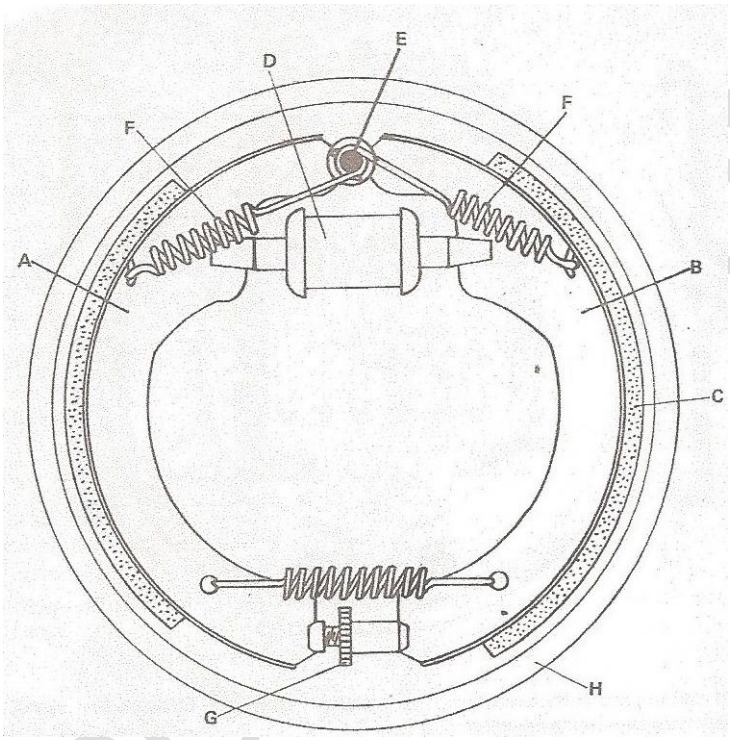
SUBJECT	YEAR 4
TIME ALLOCATION	1 HOUR
DATE	DATE:
EXAMINER	
LEARNER NAME AND SURNAME	
GROUP	YEAR 4_____
MARKS OBTAINED	_____ /50 _____ %

ANSWER ALL THE QUESTIONS ON THE EXAMINATION PAPER

SECTION A: BRAKES

1.1 DRUM BRAKES.

1.1.1. USE THE WORDS IN THE WORD BANK TO COMPLETE THE TABLE OF THE DRUM BRAKE SYSTEM. WRITE THE AWNSER NEXT TO THE CORESPONDING LETTER IN THE COLLOM BELOW.



WORD BANK

AJUSTER

PULLBACK SPRING

ANCOR POINT

LEADING SHOE

BRAKE DRUM

TRAILING SHOE

WHEEL CYLIMDER

BRAKE LINING

PART	NAME
A	
B	
C	
D	
E	
F	
G	
H	

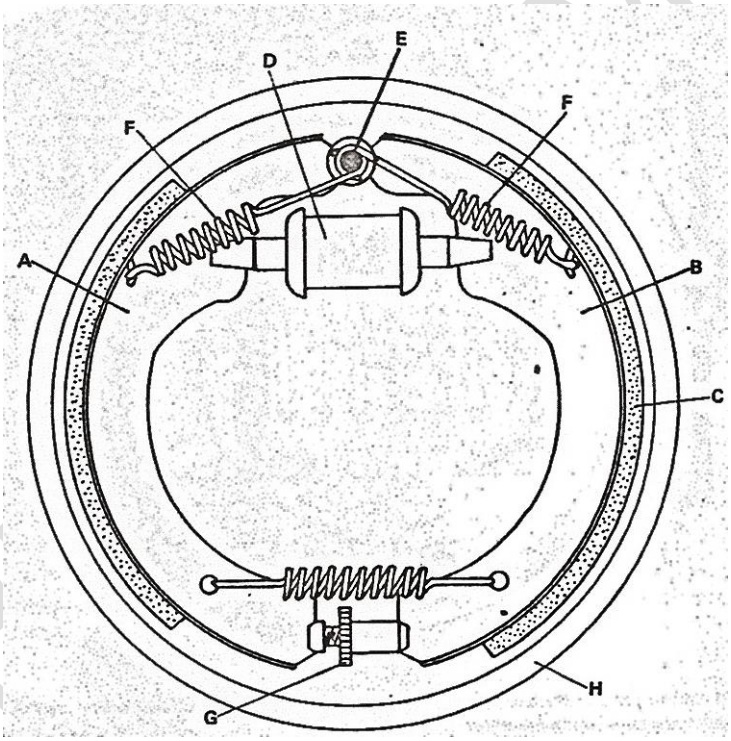
Exemplar 3 **LEVEL 1**

SUBJECT	YEAR 4
TIME ALLOCATION	1 HOUR
DATE	DATE:
EXAMINER	
LEARNER NAME AND SURNAME	
GROUP	YEAR 4_____
MARKS OBTAINED	_____ /50 _____ %

ANSWER ALL THE QUESTIONS ON THE EXAMINATION PAPER

SECTION A: BRAKES

1.1 DRUM BRAKES.
1.1.1. WRITE THE CORRECT LETTER NEXT TO THE CORESPONDING NAME IN THE COLLOM BELOW.



PART	NAME
	LEADING SHOE
	TRAILING SHOE
	BRAKE LINING
	WHEEL CYLIMDER
	ANCOR POINT
	PULLBACK SPRING
	AJUSTER
	BRAKE DRUM

Annexure 3:

LESSON PLAN: Motor Mechanics

Name of School:		Year 3 (Term 4)		Week: 1 - 2
Name of Teacher(s):			Date	
Focus	**Basic knowledge of hydraulic components**			

CLASSROOM ACTIVITIES (generic planning):

DAY	1	2	3	4	5
Content, concepts and skills	• Demonstrate basic knowledge of hydraulic components and their application • Identify components by name and explain their functions	• Explain the purpose of the components in relation to the hydraulic circuit or systems	• Identify differences in component types and explain in relation to the method of functioning	• Demonstrate how to replace warn part (rear and front) (Expanded Opportunity) • Safety Considerations	Formal Assessment
Teacher's Activities	**INTRODUCTION** • Show the learners a video • Take learners out to the real vehicle for visual inspection	Explain the following to the learners: • Principles of hydraulics • Drawing a system of components linking together	• The teacher points out the wear and tear in components • SHE	• Teacher demonstrate to the learners how to replace warn parts of a hydraulic system. • Teacher refers learners to OHS (week 1)	• Teacher gives the instructions as per requirements of the formal assessment. • Teacher uses a rubric to evaluate the competence of learners
Learners' Activities	Participates by watching the video and taking	Learners identify the components by name and explain their functions.	Learners must inspect components for wear and tear.	Learners are given an opportunity to apply their knowledge under supervision and guidance of the teacher.	Learners complete the assessment (drawing and label) of different components of a hydraulic system in their workbooks.

Type of Assessment	Informal	Informal	Informal	Informal - Practical/Theory	Formal
Resources	DBE workbook	DBE workbook	DBE workbook	DBE workbook	DBE workbook
	Loose components	Learners' book	Learners' book	Safety Equipment (glasses; mask and overhauls); Jack stands	Portfolio of Evidence
	How Car Brake Works.mp4	Video - replay	Loose components	Tools and materials: Brakes shoes and pads; cleaning materials	Camera for recording of evidence of portfolio
	Vehicle or model of hydraulics				
IDENTIFIED LEARNERS' NEEDING SUPPORT:		**Name of learner(s)**		**Name of learner(s)**	
Indicate the name(s) of learner(s) identified as having learning difficulties/not achieving or use the class list.		1.		5.	
		2.		6.	
		3.		7.	
		4.		8.	

CLASSROOM ACTIVITIES		
How are you going to include and differentiate SUPPORT for learners?		
Teacher Activities	Learner Activities:	**Resources**
How are you going to include and differentiate EXPANDED OPPORTUNITY for learners?		
Teacher Activities	Learner Activities:	**Resources**

TEACHER REFLECTION:

_____

_____

_____

Teachers Signature: _____ Date: _____

Pre -Moderated by line manager e.g. HOD/Deputy Principal (attach a moderation tool?): Signature: _____ Date: _____

Post moderation by HOD:

Formal Assessment Feedback								
Assessment Results Analysis	**Level of achievement**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
	Indicate number of learners per level achieved							