



KENYA INSTITUTE OF CURRICULUM DEVELOPMENT

A Skilled and Ethical Society

SENIOR SCHOOL CURRICULUM DESIGN

POWER MECHANICS

GRADE 11

OCTOBER, 2025

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NATIONAL GOALS OF EDUCATION

Education in Kenya should:

1. Foster nationalism and patriotism and promote national unity.

Kenya's people belong to different communities, races and religions, but these differences need not divide them. They must be able to live and interact as Kenyans. It is a paramount duty of education to help young people acquire this sense of nationhood by resolving conflicts and promoting positive attitudes of mutual respect which enable them to live together in harmony and foster patriotism in order to make a positive contribution to the life of the nation.

2. Promote the social, economic, technological and industrial needs for national development.

Education should prepare the youth of the country to play an effective and productive role in the life of the nation.

a) Social Needs

Education in Kenya must prepare children for changes in attitudes and relationships which are necessary for the smooth progress of a rapidly developing modern economy. There is bound to be a silent social revolution following in the wake of rapid modernization. Education should assist our youth to adapt to this change.

b) Economic Needs

Education in Kenya should produce citizens with the skills, knowledge, expertise and personal qualities that are required to support a growing economy. Kenya is building up a modern and independent economy which is in need of an adequate and relevant domestic workforce.

c) Technological and Industrial Needs

Education in Kenya should provide learners with the necessary skills and attitudes for industrial development. Kenya recognizes the rapid industrial and technological changes taking place, especially in the developed world. We can only be part of this development if our education system is deliberately focused on the knowledge, skills and attitudes that will prepare our young people for these changing global trends.

3. Promote individual development and self-fulfilment.

Education should provide opportunities for the fullest development of individual talents and personality. It should help children to develop their potential interests and abilities. A vital aspect of individual development is the building of character.

4. Promote sound moral and religious values.

Education should provide for the development of knowledge, skills and attitudes that will enhance the acquisition of sound moral values and help children to grow up into self-disciplined, self-reliant and integrated citizens.

5. Promote social equity and responsibility.

Education should promote social equality and foster a sense of social responsibility within an education system which provides equal educational opportunities for all. It should give all children varied and challenging opportunities for collective activities and corporate social service irrespective of gender, ability or geographical environment.

6. Promote respect for and development of Kenya's rich and varied cultures.

Education should instill in the youth of Kenya an understanding of past and present cultures and their valid place in contemporary society. Children should be able to blend the best of traditional values with the changing requirements that must follow rapid development in order to build a stable and modern society.

7. Promote international consciousness and foster positive attitudes towards other nations.

Kenya is part of the international community. It is part of the complicated and interdependent network of peoples and nations. Education should therefore lead the youth of the country to accept membership of this international community with all the obligations and responsibilities, rights and benefits that this membership entails.

8. Promote positive attitudes towards good health and environmental protection.

Education should inculcate in young people the value of good health in order for them to avoid indulging in activities that will lead to physical or mental ill health. It should foster positive attitudes towards environmental development and conservation. It should lead the youth of Kenya to appreciate the need for a healthy environment.

THE SENIOR SCHOOL IN THE COMPETENCY BASED CURRICULUM

Senior School is the fourth level of Basic Education in the Competency Based Curriculum (CBC) that the learner shall proceed to after the Pre-Primary School, Primary School and Junior School levels. The essence of Senior School is to offer learners a pre-tertiary/university/ pre-career experience in which the learners have an opportunity to choose pathways, tracks and subjects where they shall have demonstrated interest and/or potential at the earlier levels. Senior School comprises three years of education for learners generally in the 16-18 years age bracket and lays the foundation for further education and training at the tertiary level and the world of work. In the CBC vision, learners exiting this level are expected to be *engaged, empowered and ethical citizens* ready to participate in the socio-economic development of the nation.

At this level, the learner shall take seven (7) learning areas as recommended by the *Presidential Working Party on Educational Reforms* (PWPER, 2023). These shall comprise **four compulsory learning areas** namely: English, Kiswahili, Essential Mathematics/Core Mathematics and Community Service Learning (CSL). Learners will choose between Core Mathematics (for learners pursuing the Science Technology Engineering and Mathematics Pathway) and Essential Mathematics (for learners pursuing the non-STEM pathways). The learner will select three learning areas depending on their career choice, aptitude, interest and personality with guidance by the Senior School career teacher.

LEARNING OUTCOMES FOR SENIOR SCHOOL

By the end of Senior School, the learner should be able to:

1. communicate effectively and utilise information and communication technology across varied contexts,
2. apply mathematical, logical and critical thinking skills for problem solving,
3. apply basic research and scientific skills to manipulate the environment and solve problems,
4. exploit individual talents for leisure, self-fulfilment, career growth, further education and training,
5. uphold national, moral and religious values and apply them in day-to-day life,
6. apply and promote health care strategies in day-to-day life,
7. protect, preserve and improve the environment for sustainability,
8. demonstrate active local and global citizenship for harmonious co-existence,
9. demonstrate appreciation of diversity in people and cultures,
10. manage pertinent and contemporary issues responsibly.

TABLE 1: LIST OF SUBJECTS AT SENIOR SCHOOL

Core Subjects	Arts & Sports Science	Social Sciences	Science, Technology, Engineering & Mathematics (STEM)
1. English 2. Kiswahili/KSL 3. Core Mathematics/ Essential Mathematics 4. Community Service Learning (CSL)	5. Sports and Recreation 6. Music and Dance 7. Theatre and Film 8. Fine Arts	9. Literature in English 10. Indigenous Languages 11. Fasihi ya Kiswahili 12. Sign Language 13. Arabic 14. French 15. German 16. Mandarin Chinese 17. Christian Religious Education 18. Islamic Religious Education 19. Hindu Religious Education 20. Business Studies 21. History and Citizenship 22. Geography	23. Biology 24. Chemistry 25. Physics 26. General Science 27. Agriculture 28. Computer Studies 29. Home Science 30. Aviation 31. Building Construction 32. Electricity 33. Metalwork 34. Power Mechanics 35. Woodwork 36. Media Technology 37. Marine and Fisheries Technology

Note:

- Physical Education (PE) and Information Communication and Technology (ICT) will be offered to all learners to facilitate learning, enjoyment and acquisition of life skills.
- Every school shall offer Pastoral/Religious Programme of Instruction (P/RPI) to enhance moral, spiritual and character development of the learners.
- There shall be one (1) lesson for personal or group study to deepen knowledge and enhance skills in areas of choice by the learners.

Table 2 provides guidelines on distribution of lessons at Senior School.

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TABLE 2: LESSON DISTRIBUTION AT SENIOR SCHOOL

Subjects	No of Lessons Per Week (40 minutes per lesson)
Core Subjects 4	
1. English	5
2. Kiswahili	5
3. Essential Mathematics/Core Mathematics	5
4. Community Service Learning	3
Elective Subjects	
5. Elective 1	5
6. Elective 2	5
7. Elective 3	5
* Physical Education	3
* ICT Skills	2
*PPI	1
* Learner Personal /Group Study	1
Total Number of Lessons	40

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ESSENCE STATEMENT

Power Mechanics as a subject builds upon the competencies acquired in Pre-Technical studies at Junior School. At this level, learners will deepen their understanding of mechanical principles, power systems and practical applications moving from basic concepts to more complex and specialized ones.

The subject covers key content areas including; Fundamentals of power mechanics, Related drawing, Vehicle systems and Engines. The transition emphasises enhanced critical thinking, problem-solving, and hands-on skills that prepare learners for real-world technical challenges. Learners are expected to develop the core competencies and values outlined in the Basic Education curriculum Framework (BECF). Pertinent and contemporary issues (PCIs) such as social economic and environmental issues and citizenship education and are mainstreamed in the learning experiences. Learning at this level is learner centered and formative assessment emphasised.

Upon completion of Senior School, competencies gained by learners in this subject will enable them transit into various post-secondary tertiary institutions such as Universities, National polytechnics, technical training institutes, Technical and vocational centres or transit to the world of work.

SUBJECT GENERAL LEARNING OUTCOMES

By the end of Senior School, the learner should be able to:

1. attain a firm foundation for career growth, further training and education in power mechanics related areas of study;
2. utilise acquired power mechanics competencies to service and repair motor vehicle systems;
3. apply acquired drawing skills to interpret and communicate engineering designs using information and communication technology where applicable;
4. relate positively with members of the society during visits to work environment;
5. use acquired knowledge to identify business opportunities related to power mechanics;
6. appreciate the place of power mechanics in day-to-day life.

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SUMMARY OF STRANDS AND SUB STRANDS

Strand	Sub Strand
1.0. Fundamentals of Power Mechanics (45 Lessons)	1.1. Principles of Power Mechanics (6 lessons) 1.2. Health and safety in Power Mechanics work environment (6 lessons) 1.3. Metalwork processes in power mechanics (5 lessons) 1.4. Properties and Application of Materials in Power Mechanics (8 lessons) 1.5. Project (20 lessons)
2.0 Related Drawing (35 Lessons)	2.1. Isometric projection (10 lessons) 2.2. Orthographic projection (10 lessons) 2.3. Limits, fits and tolerance (5 lessons) 2.4. ISO thread forms (10 lessons)
3.0 Vehicle Systems (45 Lessons)	3.1 Braking system (10 lessons) 3.2 Suspension system (15 lessons) 3.3 Steering system (10 lessons) 3.4 Soldering in Vehicle systems (10 lessons)
4.0 Engines (55 Lessons)	4.1 Engine systems (15 lessons) 4.2 Four-stroke petrol engine (15 lessons) 4.3 Two-stroke petrol engine (15 lessons) 4.4 Petrol fuel Systems (10 lessons)

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STRAND 1.0: FUNDAMENTALS OF POWER MECHANICS

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
1.0 Fundamentals of Power Mechanics (45 Lessons)	1.1 Principles of Power Mechanics	By the end of the sub strand, the learner should be able to: a) explain the fundamental principles of power mechanics, b) apply fundamental principles of power mechanics to work out exercises, c) describe the types of power transmitters used in power mechanics, d) identify tools used in power mechanics, e) recognise the importance of principles of power mechanics.	The learner is guided to: - use online resources and print media to search for information on the fundamental principles of power mechanics (<i>energy, power, force, work, efficiency, torque, motion, inertia and friction</i>), - solve mathematical questions involving energy, power, force, work, efficiency, torque, motion, inertia and friction, - discuss on how to solve mathematical questions involving energy, power, force, work, efficiency, torque, motion, inertia and friction - use available resources to search for information on power transmitters used in power mechanics, - use available resources to identify types of power transmitters,	How is knowledge on principles of Power Mechanics applied in day-to-day life?

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			- use sketches to describe the types of power transmitters used in power mechanics (<i>clutches, gears, shafts, chains and sprocket, belts and pulleys, couplings, cables. Lever</i>), - use available resources to identify tools used in power mechanics (<i>spanners- open, ring, combination, wheel spanners- cross, L-shaped, two way; allen keys; jacks- bottle, scissor</i>), - reflect on the importance of principles of power mechanics.	
Core Competencies to be Developed: - Critical thinking and problem solving as the learner develops complex problem solving skills while working out problems involving energy, power, force, work, and torque. - Digital literacy as the learner develops skills of manipulating digital devices to access online resources. while searching for information on the fundamental principles of Power Mechanics.				
Pertinent and Contemporary Issues (PCIs): - Online safety as the learner safely makes reference to online resources to search for information. - Self esteem as the learner successfully sketches power transmitters.				
Values: - Unity as the learner displays a sense of cooperation while discussing with peers in groups. - Respect as the learner exhibits a sense of open mindedness while accommodating other peers' opinions during discussion.				

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Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
1.0 Fundamentals of Power Mechanics	1.2 Health and safety in a power mechanics work environment	By the end of the sub strand, the learner should be able to: a) identify hazards in a power mechanics work environment, b) describe hazard mitigation measures in a power mechanics work environment, c) develop a hazard mitigation plan for a power mechanics work environment, d) demonstrate emergency evacuation procedure in a power mechanics work environment. e) value health and safety in a power mechanics work environment.	The learner is guided to: • use online and print resources to search for information on hazards in a power mechanics work environment, • brainstorm on hazards associated to a power mechanics work environment, • use available resources to search for information on hazard mitigation measures in a power mechanic environment, • create a hazard mitigation plan for power mechanics work environment (<i>physical, chemical, ergonomics, fire, electrical, noise and respiratory</i>), • conduct clean-up and safely handle materials in a power mechanics work environment, • watch video clips on emergency evacuation procedures,	How is safety important in a power mechanics work environment?

			• role-play emergency evacuation in the work environment, • acknowledge the importance of health and safety in a power mechanics work environment.	
Core Competencies to be developed: • Creativity and imagination as the learner develop skills of viewing problems in a different way while developing a hazard mitigation plan for identified power mechanics tasks. • Self-efficacy as the learner develops effective communication skills while brainstorming. • Learning to learn as the learner develops skills of organizing own learning while searching for information on hazards in power mechanics work environment.				
Pertinent and Contemporary Issues (PCIs): • Decision making as the learner identifies various hazards. • Safety and Security as learners role play an emergency evacuation. • Waste Management as learner cleans the work environment.				
Values: • Unity as the learner displays a sense of inclusivity while working with peers in groups. • Respect as the learner displays open mindedness while accommodating other members' opinions as they brainstorm. • Patriotism as a learner displays sense of citizenship while taking care of work environment.				

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
1.0 Fundamentals of Power Mechanics	1.3 Metalwork processes in power mechanics	By the end of the sub strand, the learner should be able to: a) identify tools used in metalwork processes, b) describe metalwork processes in a power mechanics work environment, c) perform metalwork processes in a power mechanics work environment, d) appreciate metalwork processes in power mechanics.	The learner is guided to: • use online resources or print materials to search for information on tools used in metalwork processes (<i>measuring and marking out, cutting-hacksaw, circular saw; hammers-ball pein, mallets; bending tools- anvil, pliers; holding tools- vices; finishing- files, grinder</i>), • use available resources to identify tools used in metalwork processes, • use available resources to search for information on metalwork processes (<i>measuring, cutting, bending, finishing-grinding, buffing and polishing, brushing, surface protection</i>), • brainstorm on metalwork processes in a power mechanics work environment, • carry out metalwork processes in power mechanics work environment (<i>measuring, cutting, bending, finishing-filing, grinding, buffing, deburring and</i>	Why is it important to learn about metalwork processes in power mechanics?

			<i>polishing, brushing; surface protection- painting, oil application</i>), • acknowledge the importance of metalwork processes in power mechanics.	
Core Competencies to be Developed: • Learning to learn as the learner develops skills of carrying out investigations while searching for information on tools used in metalwork processes. • Critical thinking and problem solving as the learner develops evaluation and decision-making skills while carrying out metalwork processes. • Communication and collaboration as the learner develop teamwork skills while brainstorming on metalwork processes in a power mechanics work environment. • Digital literacy as the learner develops skills of interacting with digital technology while accessing online resources.				
Pertinent and Contemporary Issues (PCIs): • Online safety as the learner responsibly uses the internet to search for information on metalwork processes. • Self-management skills as the learner carries out metalwork processes diligently.				
Values: • Unity as the learner shows a sense of cooperation while brainstorming on metalwork processes. • Respect as the learner displays a sense of acceptance while accommodating peers' ideas and opinions while brainstorming. • Responsibility as the learner displays a sense of hard work while carrying out metalwork processes diligently.				

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
1.0 Fundamentals of Power Mechanics	1.4 Properties and application of Materials in Power mechanics	By the end of the sub strand, the learner should be able to: a) explain properties of materials used in power mechanics, b) identify common materials used in power mechanics, c) relate properties of material to their uses in power mechanics, d) appreciate the importance of materials in power mechanics.	The learner is guided to: • use online resources and print media to search for information on properties of materials used in power mechanics, • discuss with peers the properties of materials used in power mechanics (<i>hardness, strength-tensile, compressive, shear, torsion, strain-tensile, compressive, shear, torsion, weldability, fusibility, elasticity, resilience, embeddability, rigidity</i>), • use realia to identify common materials used in power mechanics (<i>aluminium and aluminium alloys, steel, copper, cast iron, glass polymers-plastic and rubber</i>), • use available resources to search for information on uses of different types of materials in power mechanics, • develop a table to relate the property of a material and its use.	How are properties of materials important in power mechanics?

Core Competencies to be Developed:

- Communication and collaboration as the learner develops speaking skills while discussing with peers on the properties of materials used in power mechanics.
- Digital literacy as the learner develops skills of interacting with digital technology while using digital devices to search for information on properties of materials.
- Creativity and imagination as the learner develops skills of making connections when creating a table that relates the property of a material to its use.
- Learning to learn as the learner develops skills of sharing learnt knowledge while discussing.

Pertinent and Contemporary Issues (PCIs):

- Self-esteem as the learner displays a sense of self-worth when developing a table to relate the property of a material and its use.
- Online safety as the learner displays responsible use of the internet to search for information.

Values:

- Unity as the learner displays skills of cooperation with peers while discussing the properties of materials used in power mechanics.
- Respect as the learner displays a sense of open mindedness while accommodating other peers' opinion during discussions.

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
1.0 Fundamentals of Power Mechanics	1.5 Project	By the end of the sub strand, the learner should be able to: a) identify a problem in the community that can be solved using the knowledge and skills acquired in power mechanics, b) suggest an activity that can be implemented to solve the problem identified. c) implement the identified activity in the society using available resources, d) appreciate the need for applying knowledge and skills acquired in school to	The learner is guided to: • brainstorm on the problems in the community that can be solved using the knowledge and skills acquired in power mechanics, • discuss with members of the community on the possible action(s) that can be taken to solve identified problem (<i>for example; servicing machines and equipment, arranging power mechanics work environment, safety awareness in the workplaces and on the road and others that are relevant to power mechanics and the community</i>), • work with members of the community to select action(s) that can be implemented to solve the identified problem using locally available resources, • plan and execute the action with the members of the community.	How can knowledge and skills acquired in power mechanics applied in solving problems in the community?

		solve the problems in the society.	- do a follow up and get feedback from the society on the effectiveness of the action, - brainstorm on the importance of applying knowledge and skills acquired in school to solve problems in the society.	
Core Competencies to be Developed: - Communication and collaboration as the learner develops teamwork skills while discussing with members of the society on the possible action(s) that can be taken to solve identified problem, - Critical thinking and problem solving as the learner develops open mindedness and creativity skills while brainstorming on the problems in the community. - Creativity and imagination as the learner develops networking skills while working with members of the society - Citizenship as the learner develops active community life skills while working with members of the community for a common goal to solve identified problem.				
Pertinent and Contemporary Issues (PCIs): - Social cohesion when the learner interacts with members of the community while discussing on the possible action(s) that can be taken to solve the identified problem. - Effective communication as the learner does a follow up and get feedback from the society.				
Values: - Peace as the learner displays a sense of compassion by respecting diverse opinions while discussing with peers and members of the community. - Social justice as the learner display a sense of unity while according equal opportunities to peers during discussions. - Integrity as the learner displays accountability while selecting action(s) that can be implemented to solve the identified problem. - Patriotism as the learner displays citizenship by identifying and solving the problem in the community.				

Suggested Assessment Rubric

Indicator \ Level	Exceeds Expectation	Meets Expectation	Approaches Expectation	Below Expectation
Ability to apply fundamental principles of power mechanics to work out exercises.	Applies more than four fundamental principles to work out exercises	Applies four fundamental principles to work out exercises.	Applies three fundamental principles to work out exercises.	Applies two or less fundamental principles to work out exercises
Ability to describe hazard mitigation measures in a power mechanics work environment.	Describes more than three hazard mitigation measures in a power mechanics work environment.	Describes three hazard mitigation measures in a power mechanics work environment.	Describes two hazard mitigation measures in a power mechanics work environment.	Describes one hazard mitigation measures in a power mechanics work environment.
Ability to perform metalwork processes in a power mechanics work environment.	Performs more than three metalwork processes in a power mechanics work environment.	Performs three metalwork processes in a power mechanics work environment.	Performs two metalwork processes in a power mechanics work environment.	Performs one metalwork process in a power mechanics work environment.
Ability to relate property of material to their uses in power mechanics	Relates property of material to their uses in power mechanics in details.	Relates property of material to their uses in power mechanics	Relates property of material to their uses in power mechanics leaving out few details.	Relates property of material to their uses in power mechanics leaving out many details.

STRAND 2.0: RELATED TECHNICAL DRAWING

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
2.0 Related Technical Drawing	2.1 Isometric projection	By the end of the sub strand, the learner should be able to: a) describe isometric projection as used in drawing, b) draw basic shapes in isometric projection, c) construct circles and arcs in isometric projection, d) convert given orthographic views into isometric projection, e) appreciate the application of isometric projection in real life.	The learner is guided to: • use print or online resources to search for information on isometric projection, • construct drawing basic shapes in isometric projection (cubes and cuboids), • draw circles and arcs in isometric projection, • draw isometric shapes from given orthographic views, • brainstorm on the application of isometric projection.	1. Why is isometric projection important in real life? 2. How are skills on isometric projection applied in power mechanics?
Core Competencies to be Developed: • Learning to learn as the learner develops skills of carrying out research while searching for information, • Self-efficacy as the learner develops effective communication skills while brainstorming. • Digital literacy as the learner develops skills of connecting using technology while connecting and using internet to search for information.				
Pertinent and Contemporary Issues (PCIs): • Decision making as the learner selects appropriate digital and print media resource when searching for information on isometric projection.				

- Career guidance as the learner brainstorms on the application of isometric projection in real life situations.
- Values:**
- Love as the learner displays selflessness while putting the interests of others before own while brainstorming.
 - Peace as the learner displays love for peers while respecting self and others during discussion.
 - Respect as the learner displays open mindedness while accommodating other members' opinion during discussion.

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
2.0 Related Drawing	2.2 Orthographic projection	By the end of the sub strand, the learner should be able to: - describe orthographic projection as used in drawing, - distinguish between first and third angle orthographic projections, - draw given pictorial views in first angle orthographic projection, - draw given pictorial views in third angle orthographic projection, - dimension views in orthographic projection, - appreciate the application of orthographic projection in real life.	The learner is guided to: - use online resources and print resources to search for information on orthographic projection, - brainstorm on orthographic projection, - use print or online resources to search for the difference between first and third angle orthographic projections, - discuss the difference between first and third angle orthographic projections, - practise drawing given pictorial views in first angle orthographic projection (<i>front view, side/end view and plan</i>), - practise drawing given pictorial views in third angle orthographic projection (<i>front view, side/end view, and plan</i>).	- How is orthographic projection used in drawing? - How are skills in orthographic projection applied in power mechanics?

			- practise dimensioning views drawn in orthographic projection, - brainstorm on the application of orthographic projection in real life situations.	
Core Competencies to be Developed: - Critical thinking and problem solving as the learner develops interpretation and inference skills while drawing given pictorial views in first angle orthographic projection. - Self-efficacy as the learner develops self awareness skills while showing concerted attention to detail when dimension views drawn in orthographic projection. - Digital literacy as the learner develops skills of connecting with technology while using online resources to search for information on orthographic projection.				
Pertinent and Contemporary Issues (PCIs): - Career guidance when the learner brainstorms on the application of orthographic projection in real life. - Decision making as the learner distinguishes between first and third angle orthographic projections.				
Values: - Love as the learner displays self sacrifice by putting the interests of others before own interests during discussion. - Unity as the learner displays sense of cooperation while striving to achieve common goals during discussion. - Social justice as the learner displays sense of nondiscrimination by according equal opportunities to peers when brainstorming.				

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
2.0 Related Drawing	2.3 Limits, fits and tolerance	By the end of the sub strand, the learner should be able to: - define the terms limits, fits and tolerance as used in drawing, - describe the types of limits and fits used in drawing; - calculate tolerance from given drawings, - calculate limits given nominal dimensions and tolerance, - appreciate the importance of limits and fits in power mechanics.	The learner is guided to: - use online and print resources to search for information on limits fits and tolerance as used in power mechanics, - discuss on the definition of the terms; limits, fits and tolerance, - discuss the types of limits and fits (<i>clearance fit, interference fit, transition fit</i>), - work out tolerance in given drawings, - determine limits given nominal dimensions and tolerance, - brainstorm on the importance of limits and fits in power mechanics.	1. How are limits, fits and tolerance applied in real life situations?
Core Competencies to be Developed: - Critical thinking and Problem solving as the learner develops explanation skills when determining limits from given nominal dimensions and tolerance. - Communication and Collaboration as the learner develops teamwork skills when contributing to group decision making by actively participating in discussion. - Self-efficacy as the learner develops effective communication skills by clearly defining the terms limits, fits and tolerance.				

- Digital literacy as the learner develops digital citizenship skills by behaving safely and ethically in networked environment when searching for information using digital devices.

Pertinent and Contemporary Issues (PCIs):

- Decision making as the learner determines tolerance in drawings.
- Self-awareness as the learner brainstorms on the importance of limits and fits in power mechanics.

Values:

- Love as the learner displays compassion by respecting other's opinions during discussion.
- Unity as the learner displays cooperation while working with peers for a common goal.

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
2.0 Related Drawing	2.4 ISO Thread forms	By the end of the sub strand, the learner should be able to: a) identify the parts of ISO thread forms used in drawing, b) describe types of ISO thread forms used in drawing, c) illustrate types of ISO thread forms used in drawing, d) appreciate the importance of ISO thread forms in power mechanics.	The learner is guided to: • use online and print resources to search for information on parts of ISO thread form (<i>pitch, root, crest</i>); • illustrate the parts of ISO thread forms (<i>pitch, root, crest</i>), • use online and print resources to search for information on types of ISO thread forms (<i>acme, buttress, square, unified, metric</i>), • discuss the types of ISO thread forms, • sketch different types of ISO threads profile (<i>acme, buttress, square, unified, metric</i>), • brainstorm on the importance of ISO thread forms in power mechanics.	What are the characteristics of ISO thread forms?
Core Competencies to be Developed: • Self-efficacy as the learner develops effective communication skills by clearly describing types of ISO thread forms. • Digital literacy as the learner uses develops skills of connecting using technology when using online resources to search for information. • Communication and collaboration as the learner develops speaking skills by speaking effectively and logically during discussion.				

Pertinent and Contemporary Issues (PCIs):

- Decision making as the learner selects appropriate digital and print resources when searching for types of ISO thread forms.
- Assertiveness as the learner draw different types of ISO threads profile.

Values:

- Unity as the learner displays sense of cooperation while collaborating with peers when brainstorm.
- Respect as the learner exhibit open mindedness while accommodating other members' opinion when brainstorming.
- Integrity as the learner displays discipline while being committed to drawing types of ISO thread profiles.

Suggested Assessment Rubric

Level Indicator	Exceeds expectation	Meets expectation	Approaches expectation	Below expectation
Ability to describe isometric projection as used in drawing.	Comprehensively describes isometric projection as used in drawing.	Describes isometric projection as used in drawing.	Describes isometric projection as used in drawing leaving out few details.	Describe isometric projection as used in drawing leaving out many details.
Ability to draw given pictorial views in first angle orthographic projection.	Clearly draws given pictorial views in first angle orthographic projection.	Draws given pictorial views in first angle orthographic projection.	Draws given pictorial views in first angle orthographic projection with few blurry areas.	Draws given pictorial views in first angle orthographic projection with many blurry areas.
Ability to calculate limits given nominal dimensions and tolerance.	Calculates limits given nominal dimensions and tolerance and interprets the results	Calculates limits given nominal dimensions and tolerance.	Calculates limits given nominal dimensions and tolerance but does not interpret the results	Calculate limits given nominal dimensions and tolerance with prompts.

Level Indicator	Exceeds expectation	Meets expectation	Approaches expectation	Below expectation
Ability to illustrate different types of ISO threads profile used in drawing.	Illustrates different types of ISO threads profile used in drawing with all details.	Illustrates different types of ISO threads profile used in drawing.	Illustrates different types of ISO threads profile used in drawing missing out few details.	Illustrates different types of ISO threads profile used in drawing missing out many details.

STRAND 3.0: VEHICLE SYSTEMS

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
3.0 Vehicle Systems	3.1 Braking system	By the end of the sub strand the learner should be able to: a) explain functions of the braking system in a light vehicle, b) describe types of brakes used in light vehicles, c) illustrate the layout of brake systems used in light vehicles, d) describe the operation of braking system of a light vehicle, e) service the braking system of a light vehicle, f) appreciate the importance of brake system in a light vehicle.	The learner is guided to: - use digital and print resources to search for information on functions of light vehicle braking systems, - discuss the types of brakes used in light motor vehicles (<i>drum, disc, hydraulic, mechanical</i>), - identify components of the braking system of light vehicles, (<i>pedal, brake servo unit(booster), master cylinder, cable, wheel cylinder, brake lines and valves, caliper, disc, pad, brake shoe, adjuster, return spring, anchor</i>), sketch the layout of brake systems used in light vehicles (<i>drum, disc, hydraulic, mechanical</i>), - discuss the operation of the light vehicle braking system	1. Why are different types of brake systems used in light vehicles?

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			<i>(mechanical and hydraulic, drum and disc),</i> - carry out service of brake system; adjust brakes, bleed brakes, replace pads and shoe, clean parts, refill brake fluid, inspect for leakages. - acknowledge the importance of brake system in a light vehicle.	
Core competencies to be developed: - Learning to learn as the learner develops skills of organizing own learning while searching for information on brake systems of light vehicles. - Communication and collaboration as the learner develops teamwork skills while discussing with peers. - Critical thinking and problem solving as the learner develops evaluation and decision making skills while servicing brake systems.				
Pertinent and Contemporary Issues (PCIs): - Social cohesion as the learner harmoniously discusses with peers the operation of brake systems used in light vehicles. - Online safety as the learner responsibly accesses online resources to search for information on motor vehicle brakes,				
Values: - Respect as the learner displays a sense of acceptance while accommodates peers' ideas and opinions as they discuss. - Love as the learner displays empathy by respecting other's opinion during discussion. - Integrity as learner displays accountability by applying laid down procedure while servicing brake systems.				

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Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
3.0 Vehicle Systems	3.2 Suspension system	By the end of the sub strand, the learner should be able to: a) explain functions of the suspension system of a light vehicle, b) describe types of suspension systems used in light vehicles, c) identify components of suspension systems used in light vehicles, d) describe the operation of suspension system of a light vehicle, e) service the suspension system of a light vehicle, f) appreciate the role of suspension systems in a light vehicle.	The learner is guided to: - use digital and print materials to search for information on functions of suspension systems of a light vehicle, - discuss types of suspension systems used in a light vehicle (<i>independent, rigid</i>), - visit a workplace in the locality to identify types and components of the suspension systems of a light vehicle, - use realia or visual aids to identify components of the suspension system (<i>damper, leaf spring, coil spring, bushes, torsion bar, links, stabilizer, anti-roll/sway bar, control arms</i>), - discuss with peers' operation of suspension systems (<i>independent, rigid</i>), - perform service on the suspension system while observing safety;	Why are different types of suspension systems used in light vehicles?

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			inspect dampers for leaks, centre bolt, U-bolts, rebound clips, springs for bends or cracks, bushes for wear, replace leaf spring bushes, replace stabilizer link bushes, and perform greasing, replace centre bolt, U-bolt and rebound clips, acknowledge the role of suspension systems.	
Core Competencies to be Developed: - Citizenship as the learner develops a sense of belonging while visiting a workplace in the locality and identify types and components of the suspension systems of a light vehicle. - Digital literacy as the learner develops the skills of connecting using technology while using the internet to search for information. - Learning to learn as the learner develops the skill of learning independently when searching for information on functions of suspension system. - Self-efficacy as the learner develops the skills of self awareness when showing concerted attention to detail while servicing the suspension system.				
Pertinent and Contemporary Issues (PCIs): - Social cohesion as the learners interacts with peers while discussing. - Effective communication as the learner discusses with peers on operation of suspension system.				

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Values:

- Patriotism as the learner displays citizenship while respecting local citizens while visiting the locality.
- Unity as the learner displays a sense of cooperation while discussing with peers.
- Respect as the learner accommodates peers' ideas and opinions as they discuss in groups.
- Responsibility as the learner displays diligence by observing safety precautions while servicing suspension system.

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
3.0 Vehicle Systems	3.3 Steering system	By the end of the sub strand, the learner should be able to: a) explain functions of steering system in a light vehicle, b) describe types of steering systems used in light vehicles, c) identify components of steering systems used in light vehicles, d) describe the operation of manual steering system of a light vehicle, e) service the steering system of a light vehicle, f) appreciate steering systems in a light vehicle.	The learner is guided to: ● use digital or print resources to search for information on steering systems of a light vehicles (<i>function and steering geometry</i>), ● discuss types of steering systems in a vehicle (<i>manual, power assisted-hydraulic and electrical</i>), ● visit a workplace in the locality to identify the types and components of the steering system, ● use realia or print resources to identify components of the steering system (<i>steering wheel, column, box, pitman arm, track rod, arms, ball joints, tie rod ends, rack ends, knuckles</i>), ● discuss with peers' the operation of steering boxes (<i>rack and pinion, recirculating ball, worm and wheel, worm and sector, cam and peg</i>), ● inspect for wear of ball joints, rack ends, gears in boxes, rack and pinion, rubber boots, replace joints, refill gearbox oil, and perform greasing.	Why are different types of steering systems used in light vehicles?

			value steering systems in a light vehicle.	
Core Competencies to be Developed: - Learning to learn as the learner develops the skill of self-discipline while searching for information. - Self-efficacy as the learner develops effective communication skills by executing the task of inspecting the steering system and gives focused feedback.				
Pertinent and Contemporary Issues (PCIs): - Analytical thinking as the learner identifies components of the steering system of a light vehicle. - Citizenship as the learner visits a work place in the locality and interacts with peers and technicians.				
Values: - Unity as the learner displays a sense of cooperation while of discussing with peers the types of steering system. - Respect as the learner displays patience while according peers opportunity to contribute when discussing. - Responsibility as the learner exhibits a sense of accountability while completing assigned tasks in servicing the steering system.				

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
3.0 Vehicle Systems	3.4 Soldering in Vehicle Systems	By the end of the sub strand, the learner should be able to: a) describe soldering as used in vehicle systems, b) identify tools and equipment used in soldering vehicle systems, c) perform soft soldering on vehicle systems, d) appreciate the importance of soldering in vehicle systems.	The learner is guided to: - use online and print resources to search for information on soldering as used in vehicle system joining, - discuss with peers soldering as used in vehicle systems, - use available resources to identify tools and equipment used when soldering vehicle systems (<i>soldering iron, soldering flux, source of heat, wire brush, files, bits, sandpaper</i>), - brainstorm on the safety to be observed when soldering vehicle systems, - carry out soft soldering on vehicle systems using the correct procedures while observing safety, - recognize the importance of soldering in vehicle systems.	Where is soldering used in vehicle systems?
Core competencies to be developed: Critical thinking and problem solving as the learner develops the skill of following instructions to complete tasks when carrying out soft soldering.				

- Digital literacy as the learner develops the skill of using the internet and other applications to search for information on soldering. - Communication and collaboration as the learner develops speaking skills while speaking clearly and effectively using appropriate language during discussions.
Pertinent and Contemporary Issues (PCIs): - Analytical thinking as the learner correctly identifies tools and equipment used when soldering in vehicle systems. - Assertiveness as the learner confidently airs own views while discussing on soldering.
Values: - Social justice as the learner displays equity while sharing resources when soldering. - Peace as the learner displays love while avoiding hurting others when carrying out soldering. - Unity as the learner shows a sense of cooperation while striving to achieve a common goal during discussion. - Responsibility as the learner exhibit diligence and observes safety precautions when soldering vehicle systems.

Suggested Assessment Rubric

Level Indicator	Exceeds expectation	Meets Expectation	Approaches Expectation	Below Expectation
Ability to explain function of the braking system of a light vehicle.	Comprehensively explains function of the braking system of a light vehicle.	Explains function of the braking system of a light vehicle.	Explains function of the braking system of a light vehicle leaving out a few functions.	Explains function of the braking system of a light vehicle leaving out many functions.
Ability to service the suspension system of a light vehicle.	Services the suspension system of a light vehicle and suggests possible fault causes.	Services the suspension system of a light vehicle.	Services the suspension system of a light vehicle skipping a few procedures.	Services the suspension system of a light vehicle skipping many procedures.

Level Indicator	Exceeds expectation	Meets Expectation	Approaches Expectation	Below Expectation
Ability to service the steering system of a light vehicle.	Services the steering system of a light vehicle and suggests possible fault causes.	Services the steering system of a light vehicle.	Service the steering system of a light vehicle skipping few steps.	Service the steering system of a light vehicle skipping many.
Ability to perform soft soldering on vehicle systems.	Performs soft soldering on vehicle systems with no defect.	Performs soft soldering on vehicle systems with on defect,	Performs soft soldering on vehicle systems with two defects,	Performs soft soldering on vehicle systems with three defects.

STRAND 4.0: ENGINES

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
4.0 Engines	4.1 Engine Systems	By the end of the sub strand, the learner should be able to: a) explain cooling systems used in engines, b) describe types of manual starting systems used in engines, c) illustrate the lubrication system used in engines, d) explain the purpose exhaust system in an engine, e) service the systems of a given engine, f) appreciate the importance of engine systems.	The learner is guided to: - use online or print resources to search for information on engine cooling system (<i>functions; types -liquid, air; components -water pump, radiator, hoses, thermostat, fan, cooling fins, radiator cap; layout</i>); - discuss with peers on the operation of engine cooling system (<i>liquid, air</i>), - use online or print resources to search for information on the types of manual starting systems used in engines; - visit a power mechanics related workplace in the locality to identify the types of manual starting system (<i>kick, recoil, hand crank</i>), - use online and print resources to search for information on the lubrication system used in engines (<i>functions; types-wet sump, dry sump, mist type, pressure type; components; operation</i>); - sketch the layout of the lubrication system (<i>wet sump, dry sump, mist, pressure</i>),	How does engine systems operate?

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			- use online or print resources to search for information on exhaust systems used in engines (<i>purpose, components, layout</i>) - use appropriate tools and follow the correct procedure while observing safety to perform the following engine system service; clean the radiator, flush liquid cooling system, drain engine oil, replace oil filter, top up engine oil, replace defective parts of a manual starting system. - acknowledge the importance of engine systems.	
Core Competencies to be Developed: - Learning to learn as the learner develops skills of learning independently while searching for information on types of manual starting systems used in engines. - Communication and Collaboration as the learner develops listening and speaking skills while discussing with peers the operation of the engine cooling system. - Self-Efficacy as the learner develops task execution skills while servicing engine system following the correct procedure.				
Pertinent and Contemporary Issues (PCIs): - Effective Communication as the learner speaks clearly and listens keenly while discussing. - Online safety as the learner responsibly uses internet while searching for information.				
Values: - Peace as the learner displays compassion while respecting self and others while discussing. - Patriotism as the learner displays a sense citizenship by respecting fellow citizen while visiting a power mechanics related workplace in the locality. - Love as the learner portrays selflessness by respecting others during group discussion.				

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Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
4.0 Engines	4.2 Four-Stroke Petrol Engine	By the end of the sub strand, the learner should be able to: a) Illustrate the constructional features of a four-stroke petrol engine, b) describe the operating principles of a four-stroke petrol engine, c) overhaul a four-stroke petrol engine following the correct procedure, d) perform fault diagnosis on four - stroke petrol engines, e) value the need for four-stroke petrol engines.	The learner is guided to: - use online or print resources to search for information on the constructional features of a four-stroke petrol engine, - sketch the constructional features of a four-stroke petrol engine, - use online or print resources to search for information on principles of operation of a four - stroke petrol engine, - discuss the principles of operation of a four-stroke petrol engine (<i>induction, compression, power, exhaust</i>), - visit a workplace in the locality to explore the procedure of dismantling a four-stroke petrol engine; - identify tools used when overhauling engines (<i>torque wrench, vee blocks, piston ring remover, piston ring compressor, feeler gauge, dial gauge, vernier calliper, depth gauge, micrometre, bore gauge, engineers' blue, straight edge, plastic-gauge, telescopic gauge</i>), - overhaul a four-stroke petrol engine using the correct procedure and estimate the cost;	- How does a four-stroke petrol engine operate? - What are some of the faults associated with four-stroke petrol engine?

			- visually inspect engine parts (<i>leak, scouring, soot, corrosion, cracks, bends</i>); - perform precision measurements on engine parts (<i>bore, stroke, journals, bearing clearances, piston ring free gap, side clearance, working gap, cam rise</i>); - assemble the engine using correct procedure. - carry out fault diagnosis on an engine and interpret (<i>hard start, smoke, vibration, engine noises</i>). - appreciate the importance of four stroke petrol engines.	
Core Competencies to be Developed - Creativity and imagination as the learner develops connection skills while interpreting engine faults. - Citizenship as the learner develops skills of accessing, searching and using internet based services while maintaining a positive presence in cyberspace to search for information. - Digital literacy as the learner develop skills of using digital technology while to search for information.				
Pertinent and Contemporary Issues (PCIs) - Safety and security as the learner observe safety while overhauling a four-stroke petrol engine. - Effective Communication as the learner clearly discusses with peers the principles of operation of a four-stroke petrol engine. - Decision making as the learner interprets engine faults. - Financial literacy as the learner generates a cost estimate of engine overhaul.				
Values - Responsibility as the learner displays diligence and observes safety while overhauling four-stroke engine. - Patriotism as the learner displays citizenship by showing love for own country while visiting a workplace in the locality.				

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
4.0 Engines	4.3 Two-Stroke Petrol Engine	By the end of the sub strand, the learner should be able to: a) illustrate the constructional features of a two-stroke petrol engine, b) describe the operating principles of a two-stroke petrol engine, c) overhaul a two-stroke petrol engine following the correct procedures, d) perform fault diagnosis on two-stroke petrol engine, e) value the need for two-stroke petrol engines.	The learner is guided to: - use print or online resources to search for information on the constructional features of a two-stroke petrol engine, - sketch the constructional features of a two-stroke petrol engine, - use online or print resources to search for information on principles of operation of a two-stroke petrol engine, - discuss the principles of operation of a two-stroke petrol engine - visit a workplace in the locality to explore the procedure of dismantling a two-stroke petrol engine; - overhaul a two-stroke petrol engine using the correct procedure and dispose wastes appropriately; - visually inspect engine parts (<i>leak, scouring, soot, corrosion, cracks, bends</i>); - perform precision measurements on engine parts (<i>bore, stroke, journals, bearing clearances, piston ring free gap, side clearance, working gap, cam rise</i>	What are operating principles of two-stroke petrol engines?

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			- assemble the engine using correct procedure. - interpret engine faults (<i>smoke, vibration, engine noises</i>) - appreciate the need for two-stroke petrol engines.	
Core Competencies to be Developed: - Creativity and imagination as the learner develops skills of discovering new methods of doing things while assembling a four-stroke petrol engine. - Critical thinking and problem solving as the learner develops skills of exploring complex problems while interpreting engine faults. - Citizenship as the learner develops social awareness skills while visiting a workplace in the locality to explore the procedure of dismantling a two-stroke petrol engine.				
Pertinent and Contemporary Issues (PCIs): - Waste management as the learner disposes off wastes from engine overhauling process. - Decision making as the learner decides whether to replace or service components after taking measurements. - Social Cohesion as the learner interacts with other citizens when visiting a workplace in the locality to explore the procedure of dismantling a two-stroke petrol engine.				
Values: - Patriotism as the learner as the learner exhibits citizenship by respecting fellow citizens while visiting the locality. - Social justice as the learner displays unity of purpose while discussing. - Unity as the learner displays team spirit when discussing with peers the components of an engine. - Respect as the learner accommodates peers' contribution during discussion.				

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Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
4.0 Engines	4.4 Petrol Fuel System	By the end of the sub strand, the learner should be able to: a) illustrate the layout of petrol fuel system, b) describe the function of components of petrol fuel system, c) service the fuel system of a petrol engine, d) appreciate the importance of the petrol fuel system.	The learner is guided to: • use print and online resources to search for information on the layout of petrol fuel system (mechanical), • sketch the layout of a mechanical petrol fuel system, • use available resources to search for information on the function of components of mechanical petrol fuel system (<i>fuel tank, fuel filter, fuel pump, fuel lines, carburettor</i>), • discuss the procedures of servicing mechanical petrol fuel system, • service petrol fuel system service while observing safety and dispose off the wastes appropriately; adjust float height, replace the fuel filters, service air cleaner, inspect fuel system for leakages,	How does a mechanical petrol fuel system work?

			• acknowledge the importance of the petrol fuel system.	
Core Competencies to be Developed: • Creativity and imagination as the learner develops skills of undertaking group activities while discussing. • Critical thinking and problem solving as the learner develops the skill of following instructions to complete tasks while using the correct procedure to service petrol fuel system. • Learning to learn as the learner develops the skill of organising own learning while using print and online resources to search for information on the function of components of petrol fuel system. • Self-Efficacy as the learner develops task execution skills while clearly describing functions of fuel system components.				
Pertinent and Contemporary Issues (PCIs): • Online safety as the learner responsibly uses online resources to search for information on the layout of mechanical petrol fuel system. • Waste management as the learner appropriately disposes off wastes after servicing petrol fuel system. • Safety and security while the learner observes safety while servicing the petrol fuel system.				
Values: • Unity as the learner displays cooperation and team spirit while brainstorming. • Integrity as the learner displays accountability while appropriately disposing wastes after servicing petrol fuel system.				

Suggested Assessment Rubric

Indicator	Level	Exceeds expectation	Meets expectation	Approaches expectation	Below expectation
Ability to explain the cooling system used in engines.		Comprehensively explain the cooling system used in engines.	Explains the cooling system used in engines.	Explains the cooling system used in engines skipping a few.	Explain the cooling system used in engines skipping many details.
Ability to overhaul a four-stroke petrol engine following the correct procedure.		Overhauls a four-stroke petrol engine following the correct procedure and arranges parts in order.	Overhauls a four-stroke petrol engine following the correct procedure.	Overhauls a four-stroke petrol engine following the correct procedure skipping a few steps.	Overhauls a four-stroke petrol engine following the correct procedure skipping many steps.
Ability to overhaul a two-stroke petrol engine following the correct procedure.		Skilfully overhauls a two-stroke petrol engine following the correct procedure.	Overhauls a two-stroke petrol engine following the correct procedure.	Overhauls a two-stroke petrol engine following the correct procedure but skips a few steps.	Overhauls a two-stroke petrol engine following the correct procedure but skips many steps.
Ability to service the fuel system of a petrol engine.		Comprehensively services the fuel system of a petrol engine.	Services the fuel system of a petrol engine.	Services the fuel system of a petrol engine but skips a few steps.	Services the fuel system of a petrol engine but skips many steps.

APPENDIX: LIST OF ASSESSMENT METHODS, LEARNING RESOURCES AND NON-FORMAL ACTIVITIES

Strand	Sub Strand	Suggested Assessment Methods	Suggested Learning Resources	Suggested Non formal Activities
1.0 Fundamentals of Power Mechanics	1.1 Principles of power mechanics.	• Question and answer • Written tests • Observe learners as learners sketch power transmitters • Checklist	Manilla paper and marker pens to write the general power mechanics principles print media, online resources.	Learner to explore available resources to search for principles of power mechanics.
	1.2 Health and safety in Power mechanics work environment	• Written tests • Question and answer • Checklist	Manilla paper and marker pens to list hazards in power mechanics work environments, online and print media.	Learners watch video clips on emergency evacuation procedures.
	1.3 Metalwork processes in power mechanics	• Question and answer • Written tests • Checklist	Tools for metalwork processes, visual aids and online resources.	Explore the locality to observe metalwork processes.
	1.4 Properties and application of materials in power mechanics	• Written test • Question and answer • Checklist	Visual aids, realia	Visit a workshop in the locality to identify application of properties of materials in power mechanics

Strand	Sub Strand	Suggested Assessment Methods	Suggested Learning Resources	Suggested Non formal Activities
	1.5 Project	• Checklist • Question and answer	Workshop, power mechanics workplaces, assorted tools and equipment.	Work with the community members on the problems related to power mechanics.
2.0 Related Drawing	2.1 Isometric projection	• Question and answer • Written tests • Rubric • Observe learners constructing circles and arcs in isometric projection	Drawing paper and drawing equipment to construct circles and arcs in isometric projection.	Learners to engage workers in various workplaces within the community to value the applications of isometric projection in real life situations.
	2.2 Orthographic projection	• Written test • Observe learners as they draw given pictorial views in first angle • Question and answer.	Visual aids on orthographic projection.	Learners to explore the community and identify applications of orthographic projection in real life.
	2.3 Limits, Fits and Tolerance	• Question and answer • Checklist • Observe learners as they draw limits and fits	Drawing paper and drawing set for drawing types of limits and fits.	Learners to explore the workplaces within the locality and identify application of limits and fits in real life.

Strand	Sub Strand	Suggested Assessment Methods	Suggested Learning Resources	Suggested Non formal Activities
	2.4 ISO Thread forms	• Written test • Question and answer • Observe learners as they draw various types of thread forms	Drawing paper and drawing set to draw various types of thread forms.	Learners to explore the locality and identify various types of thread forms used in fasteners.
3.0 Vehicle Systems	3.1 Braking System	• Question and answer • Written tests • Rubric • Checklist	Visual aids on light vehicle braking system circuits. Models of braking system and components	Visit motor vehicle garages in the locality to trace light vehicle braking system.
	3.2 Suspension System.	• Written test • Question and answer • Checklist	Pictures of vehicle suspension systems and system components. Realia and models of suspension system and system components	Visit parking areas or garages in the locality and identify the various types vehicle suspension systems and system components.

Strand	Sub Strand	Suggested Assessment Methods	Suggested Learning Resources	Suggested Non formal Activities
	3.3 Steering System	• Question and answer • Written test • Checklist	Visual aids of various types of vehicle steering systems.	Visit vehicle garages in the locality to identify vehicle steering system.
	3.4 Soldering in vehicle systems	• Question and answer • Written tests • Practical work • Checklist • Rubric	Visual aids on soldering, soldering tools and consumables	Learners to search for videos on soldering, download and watch.
4.0 Engines	4.1 Engine Systems	• Question and answer • Written test • Checklist	Visual aids of engine systems sectioned or dismantled engines.	Learners to develop charts on engine systems.
	4.2 Four-Stroke petrol engine	• Question and answer • Written tests • Rubric • Checklist	Visual aids, sketched illustration on Four-Stroke petrol engine.	Visit workplaces in the community to observe operation of four-Stroke petrol engine.
	4.3 Two-Stroke petrol engine	• Written test • Rubric • Question and answer • Observation schedules	Pictures or videos on four stroke diesel engines, text books, used engines sectioned and with most of the components.	Visit workplaces in the community to observe types of operation of four stroke diesel engines.

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Strand	Sub Strand	Suggested Assessment Methods	Suggested Learning Resources	Suggested Non formal Activities
	4.4 Petrol fuel systems	• Question and answer. • Written tests. • Practical work. • Checklist. • Rubric.	Videos on operation of 2-stroke petrol engine Text books.	Learners participate in searching, downloading and watching videos on the operation of 2-stroke petrol engine.

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