National School Curriculum

INSTRUCTIONAL GUIDE FOR TVET (ELECTRICAL)

CLASSES XI & XII

Department of Curriculum and Professional Development
Ministry of Education, Royal Government of Bhutan

“Your parents, relatives, and friends would be very proud of what you have achieved. At your age, to have completed your studies is your personal accomplishment. Your knowledge and capabilities are a great asset for the nation. I congratulate you for your achievements. Finally, your capabilities and predisposition towards hard work will invariably shape the future of Bhutan. You must work with integrity, you must keep learning, keep working hard, and you must have the audacity to dream big.”

- His Majesty Jigme Khesar Namgyel Wangchuck

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Foreword

COVID-19 has suddenly caused unforgiving disruptions in public education all over the world and brought about threats of fragmentation due to disparities in accessibility and connectivity in many systems. In Bhutan too, continuity of education and learning has been severely affected as a result of nationwide school closures and due to restrictions and health protocols. The disruptions have led to challenges in many existing patterns and trends in education resulting in a massive shift away from teaching and learning in traditional settings.

In the new normal education, human interaction and well-being are a priority. Digital technology that enables communication, collaboration and learning across distance, is a source of innovation and expanded potentials. As we embrace this exceptional opportunity to transform the world, and as we reimagine the organization of our educational institutions and learning environments, we need to think about where we want to go.

In the post COVID 19 era, we must prioritize the development of the whole person not just academic knowledge. Inspiration for the change can be drawn from the 1996 Delors report, Learning the treasure within, in its specification of four pillars of learning as “learning to know”, “to do”, “to be”, and “to live together”. Therefore, curricula must be increasingly perceived as an integrated and based on themes and problems that allows learners to learn to live in peace with our common humanity and our common planet. This has the potential in the development of a strong base of knowledge about one’s self and about the world and find purpose and be better able to participate in social and political milieu.

The National School Curriculum is, not just a mere response to the pandemic, but also a culmination of the curriculum reform work for the last four years by the then Royal Education Council. It is an attempt to transform education from the teaching of “what” to learning of “how” and “why” towards empowering learners with the transversal competencies and the 21st century skills, and preparing them to be lifelong learners. We are optimistic that this move orients our education process towards nurturing nationally rooted and globally competent citizens.

Wish all our learners and teachers a life enriching experiential teaching and learning.

Tashi Delek.

Tashi Namgyal

Director

Introduction

Technical and Vocational Education and Training (TVET) is aimed at providing knowledge and skills for employment. It comprise education, training and skills development related to a wide range of occupational fields, production, services and livelihood. The Department of Curriculum and Professional Development, Ministry of Education envisages that the TVET curriculum has a place in the mainstream education system, as it is the case in most of the education systems of the developed world. The formal Technical and Vocational Education and Training (TVET) began in 1965 at Don Bosco Technical School (DBTS), in Kharbandi (presently known as Rinchending) in Phuntsholing. Even after that, major curriculum reform was planned by the then Department of Curriculum Research and Development (DCRD) in an attempt to make education relevant to the Bhutanese society through diversification of Secondary Education Curriculum in the schools, which included the introduction of TVET.

As per 'National Education Framework' developed collaboratively by the Royal Education Council (REC) and the Ministry of Education (MoE), it provides a pathway on integrating technical/vocational education in the mainstream school education curriculum and as elective subjects in higher classes (NEF, 2009; page 64).

With the collaborative efforts of the Ministry of Labour and Human Resources and the erstwhile Department of Curriculum Research and Development, Vocational Curriculum has been introduced in the schools with assistance from TTIs since 2011. After the first MoU that was signed between MoE and MoLHR in 2011, the second MoU was signed again in 2014, to improve technical/vocational courses. The technical/vocational courses offered by the TTIs/IZCs are adapted and redesigned and are offered in schools aligning to the 'Bhutan Education Blue Print' 2014-2024, which recommends upscaling and diversification of TVET in schools through the provision of alternative pathways in schools and the tertiary education systems, owing to the limited access to such courses, despite the growing demand for technical skills in the country.

The resolutions of the National School Curriculum Conference 2016, also strongly emphasised the need to upscale and deepen TVET. Accordingly, the TVET framework is developed from classes PP to XII, schools equipped with necessary resources and instructors trained. Tripartite MoU among the then REC, MoE and MoLHR was also signed in 2018 to implement the programmes collaboratively.

Although the TVET curriculum is competency based with more emphasis on hands-on experience, further improvements have been made taking care of cognitive and affective domains besides psychomotor. Teaching and learning approaches have also been enriched with the recommendation to use ICT and online resources. Since the pandemic (COVID-19) has resulted in the closure of schools, it has taught us lessons to be prepared for such an untoward situation in the future. Thus, the National School Curriculum Instructional Guide is prepared not only to encourage blended learning but also to facilitate remote learning. The guide would help the schools to implement the curriculum effectively without limiting to contact teaching/learning besides using a variety of pedagogies.

Purpose of the Instructional Guide

Among the many definitions of 'curriculum' this Instructional Guide underscores the meaning of curriculum as a standard and competency-based sequence of planned learning experiences where learners practise and achieve the proficiency in applying the learning experiences in real life scenarios. These proficiencies, in the curriculum framework, have been stated as "competencies" and 'objectives" for each class. In keeping with the principle, 'less is more' as stated the National School Curriculum, the contents of the curriculum have been reworked, so that learners can be engaged more in activities that can lead to the acquisition of required skills rather than having them 'cover the syllabus'.

This Instructional Guide believes that the classroom teachers, as professional individuals, can make the most authentic and reliable judgment about each learner's learning needs and the learning experiences to be provided to propel the learners in the learning continuum. With these beliefs and principles as the background, the following are the purposes of this document.

- Facilitate learners acquire required skills and competencies.
- Strengthen blended learning, including flipped classroom with multimedia, digital pedagogies and ICT devices and websites as tools to share the responsibility of learning amongst the learners, teachers, the parents and other stakeholders.
- Facilitate the use of Continuous Formative Assessment for learning using diverse appropriate assessment techniques and tools commensurate with individual differences in learning, and gather evidence to guide planning of educational programmes and activities for learners.
- Promote inclusive learning through the blended learning which facilitates learning anywhere, any time with the learner being responsible for the learning.
- Provide suggestive means of acquiring required skills by building interrelationship among, and through, the integration of the four strands of the curriculum.
- Help teachers assume the roles of facilitator, guide, motivator and evaluator.
- Guide teachers, parents and other stakeholders in helping learners achieve their potential.
- Empower teachers to design their own 'course of study' or 'class curriculum' for their students in line with the National School Curriculum Framework.
- Enhance sharing the burden of responsibility and accountability for learning amongst the stakeholders, including the learners themselves.

In this age of advanced communication and information technology, contents are widely available from a number of sources. Therefore, the teachers can select, structure and sequence the contents as required to best suit the learners' need while maintaining coherence and consistency. In other words, while the contents of the curriculum are negotiable, the competencies and objectives are not. While, teachers may have access to number of materials, it should be kept in mind that the teaching and learning should be focused on achieving the competencies rather than 'covering of the syllabus'. The teaching learning materials should be used as means to create a learning environment that is competency-based where the learners need to master the skills presented to them. While designing lesson plans and teaching learning activities, teachers need to ensure that the materials are relevant and appropriate for the given task.

The assessment should be competency-based wherein the teachers should assess the learners' mastery of the skills stated as competencies and objectives for each class. Teachers should use appropriate assessment tools and techniques depending on the nature of the learning activities. The learners should be clearly informed about the success criteria, the areas of assessment and the tools to be used so that they know exactly what tasks are to be performed or expected of them. In the process of the performance, the teacher should continuously provide feedback and, if necessary, modify instructions. Efforts have to be made to ensure that every learner has mastered the skills.

Table of Contents

Class XI

Chapter 1: Applying enigneering drawing for electrical

A. Competency/Competencies:

- ✓ Use electrical signs and symbols while drawing layout diagrams in engineering drawing.

B. Learning objectives/Topic:

Learning objectives	Topic
5.6.1 List the types of electrical signs and symbol 5.6.2 State the application of electrical signs and symbol 5.6.3 *Ensure clean and neatness of drawing* 5.6.4 *Ensure proper handling of drawing instruments* 5.6.5 Draw electrical signs and symbol	1.1 Drawing electrical signs and symbols **Overview:** The topic is about various electrical signs and symbols used while drawing layout diagrams in engineering drawing and it helps represent different electrical apparatus in a circuit diagram without having to explain it.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 1.1
- ✓ Provide handouts to learners
- ✓ Demonstrate on OPERATION SHEET 1.1
- ✓ Provide guided practice on OPERATION SHEET 1.1
- ✓ Make learners perform OPERATION SHEET 1.1
- ✓ Instruct learners to read INFORMATION SHEET 1.1 through Google Classroom
- ✓ Provide the web link https://www.youtube.com/watch?v=S16hKcZ1Y80 that explains the signs and symbols used in electrical engineering drawing
- ✓ Provide handouts, self-made tutorial video clip and PPT through Google Classroom.
- ✓ Let learners submit their response through Google Classroom or any other relevant social media
- ✓ Conduct online test

D. **Assessment:**

- ✓ Make learners to perform and explain OPERATION SHEET 1.1 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.
- ✓ Assess learner's knowledge about transistor by asking questions
- ✓ Conduct class test to assess their understanding
- ✓ Let learners carry out activities of the SAMPLE SELF CHECK 1.1
- ✓ Let the learners solve SAMPLE SELF CHECK 5.6 and submit answers through Google
- ✓ Classroom or any other relevant social media.

E. **Resources:**

- ✓ Competency-Based Learning Materials
- ✓ Handouts
- ✓ https://www.youtube.com/watch?v=S16hKcZ1Y80 (Explanation of electrical signs and symbol)

A. Competency/Competencies:

- ✓ Design a layout plan for lighting load

B. Learning objectives/Topic:

Learning objectives	Topic
5.7.1 State the types of lighting load 5.7.2 State the purpose of lighting layout plan 5.7.3 State the colour and wire size for lighting point 5.7.4 *Ensure clean and neatness of drawing* 5.7.5 *Ensure proper handling of drawing instruments* 5.7.6 Draw layout plan of lighting load	1.2 Drawing layout plan of lighting load **Overview:** The topic is about drawing layout plan of lighting load and it helps the learners design a lighting load layout diagram for any residential place.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 1.2
- ✓ Provide handouts to learners
- ✓ Demonstrates on OPERATION SHEET 1.2
- ✓ Provide guided practice on OPERATION SHEET 1.2
- ✓ Make learners perform OPERATION SHEET 1.2
- ✓ Instruct learners to read INFORMATION SHEET 1.2
- ✓ Provide Share the web link https://www.youtube.com/watch?v=PNLRlqUnGok with
- ✓ learners which explains the designing of layout plan for lighting load of a residential place
- ✓ Provide handouts, self-made tutorial video clip and PPT through Google Classroom

D. **Assessment:**

- ✓ Make learners perform and explain OPERATION SHEET 1.2 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.
- ✓ Assess learner's knowledge about transistor as an amplifier by asking questions
- ✓ Conduct class test to assess their understanding
- ✓ Let learners carry out activities of the SAMPLE SELF CHECK 1.2
- ✓ Let the learners solve SAMPLE SELF CHECK 1.2 and submit answers through Google Classroom or any other relevant social media
- ✓ Give additional relevant questions from CBLM and other resources-text/ Google/ YouTube and let learners submit answers through Google Classroom or any other relevant social media.

E. Resources:

- ✓ Competency-Based learning materials
- ✓ Handouts
- ✓ https://www.youtube.com/watch?v=PNLRlqUnGok
- ✓ (Explaination on designing of layout plan for lighting load of a residential place)

A. Competency/Competencies:

- ✓ Design a layout plan for power point

B. Learning objectives/Topic:

Learning objectives	Topic
1.3.1 State the purpose of layout plan of power point 1.3.2 State the colour coding and wire size for power point 1.3.3 Describe the requirement for lettering 1.3.4 *Ensure clean and neatness of drawing* 1.3.5 *Ensure proper handling of drawing instruments*	1.3 Drawing layout plan of power point **Overview:** The topic is about drawing layout plan of power point and it helps the learners design a lighting load layout diagram for any residential place.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 1.3
- ✓ Provide handouts to learners
- ✓ Demonstrates on OPERATION SHEET 1.3
- ✓ Provide guided practice on OPERATION SHEET 1.3
- ✓ Make learners perform OPERATION SHEET 1.3
- ✓ Let the learners discuss in the group and share their responses among them
- ✓ Instruct learners to read INFORMATION SHEET 1.3 through Google Classroom
- ✓ Provide handouts, self-made tutorial video clip, and PPT through Google Classroom.
- ✓ Share link https://www.youtube.com/watch?v=YjGJuby0Jfo which explains about designing layout plan for power point
- ✓ Let the learners submit their responses through Google Classroom or any other relevant social media.

D. **Assessment:**

- ✓ Make learners perform and explain OPERATION SHEET 1.3 and use rubric (Available in framework 2022) to assess them. Provide necessary feedback.
- ✓ Let learners carry out activities of the SAMPLE SELF CHECK 1.3
- ✓ Let the learners solve SAMPLE SELF CHECK 1.3 and submit answers through Google Classroom or any other relevant social media.
- ✓ Give additional relevant questions from CBLM and other resources-text/ Google/ YouTube and let learners submit answers through Google Classroom or any other relevant social media.

E. Resources:

- ✓ Handouts
- ✓ Competency-Based Learning Materials
- ✓ https://www.youtube.com/watch?v=YjGJuby0Jfo (Explains about designing layout plan for power point)

A. Competency/Competencies:

- ✓ Design conduit layout plan of lighting points

B. Learning objectives/Topic:

Learning objectives	Topic
1.4.1 State the purpose of conduit layout plan 1.4.2 *Ensure claen and neatness of drawing* 1.4.3 *Ensure proper handling of drawing instruments* 1.4.4 Draw conduit layout plan of lighting points	1.4 Drawing conduit layout plan of lighting points **Overview:** The topic is about drawing conduit layout plan of lighting points and it helps the learners design a conduit layout plan of lighting points

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 1.4
- ✓ Provide handouts to learners
- ✓ Demonstrate on OPERATION SHEET 1.4
- ✓ Provide guided practice on OPERATION SHEET 1.4
- ✓ Make learners perform OPERATION SHEET 1.4
- ✓ Instruct learners to read INFORMATION SHEET 1.4 through Google Classroom
- ✓ Provide the web link https://www.youtube.com/watch?v=Lw2eqgGMquI to learners which explains about designing conduit layout plan of lighting point
- ✓ Provide handouts, self-made tutorial video clip, and PPT through Google Classroom.
- ✓ Let the learners submit their responses through Google Classroom or any other relevant social media.

D. **Assessment:**

- ✓ Make learners perform and explain OPERATION SHEET 1.4 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.
- ✓ Conduct a test to assess their understanding.
- ✓ Let learners carry out activities of the SAMPLE SELF CHECK 1.4
- ✓ Let the learners solve SAMPLE SELF CHECK 1.4 and submit answers through Google Classroom or any other relevant social media.
- ✓ Give additional relevant questions from CBLM and other resources-text/ Google/ YouTube and let learners submit answer through Google Classroom or any other relevant social media

E. Resources:

- ✓ Competency-Based Learning Materials
- ✓ Handouts
- ✓ https://www.youtube.com/watch?v=Lw2eqgGMquI (Explanation of designing conduit layout plan of lighting points)

A. Competency/Competencies:

- ✓ Design conduit layout plan of power points

B. Learning objectives/Topic:

Learning objectives	Topic
1.5.1 State the purpose of conduit layout plan 1.5.2 Describe the requirement for lettering 1.5.3 *Ensure claen and neatness of drawing* 1.5.4 *Ensure proper handling of drawing instruments* 1.5.5 Draw conduit layout plan of power points	1.5 Drawing conduit layout plan of power points **Overview:** The topic is about drawing conduit layout plan of lighting points and it helps the learners design a conduit layout plan of lighting points

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 1.5
- ✓ Provide handouts to learners
- ✓ Demonstrate on OPERATION SHEET 1.5
- ✓ Provide guided practice on OPERATION SHEET 1.5
- ✓ Make learners perform OPERATION SHEET 1.5
- ✓
- ✓ Instruct learners to read INFORMATION SHEET 1.5
- ✓ Provide the web link https://www.youtube.com/watch?v=Lw2eqgGMquI which gives an explanation on how to design conduit layout plan)
- ✓ Provide handouts, self-made tutorial video clip, and PPT through Google Classroom.
- ✓ Let the learners submit their responses through Google Classroom or any other relevant social media.

D. Assessment:

- ✓ Make learners Perform and explain OPERATION SHEET 1.5 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.
- ✓ Let learners carry out activities of SAMPLE SELF CHECK 1.5
- ✓ Make learners read INFORMATION SHEET 1.5 and perform OPERATION SHEET 5.10 and ask them to send the short video as evidence through Google Classroom or any other relevant social media platform. Assess them using the checklist/performance guide.

- ✓ Let the learners solve SAMPLE SELF CHECK 1.5 and submit answers through Google Classroom or any other relevant social media.
- ✓ Give additional relevant questions from CBLM and other resources-text/ Google/ YouTube and let learners submit answer through Google Classroom or any other relevant social media

E. Resources:

- ✓ Competency-Based Learning Materials
- ✓ https://www.youtube.com/watch?v=Lw2eqgGMquI (Explanation of designing conduit layout plan of lighting points)

A. Competency/Competencies:

- ✓ Draw plate earthing layout plan

B. Learning objectives/Topic:

Learning objectives	Topic
1.6.1 Define earthing 1.6.2 List types of earthing 1.6.3 List components of earthing 1.6.4 State purpose of earting 1.6.5 *Ensure clean and neatness of drawing* 1.6.6 *Ensure proper handling of drawing instruments* 1.6.7 Draw plate earthing layout plan	1.6 Drawing plate earthing layout plan **Overview:** The topic is about drawing plate eathing layout plan and it lets the learners design the plate earthing before installing it.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 1.6
- ✓ Provide handouts to learners
- ✓ Demonstrate on OPERATION SHEET 1.6
- ✓ Provide guided practice on OPERATION SHEET 1.6
- ✓ Instruct learners to read INFORMATION SHEET 1.6 through Google Classroom.
- ✓ Share the web link https://www.youtube.com/watch?v=iaFPJMiaIGM with learners which demonstrates how to draw plate earthing layout paln
- ✓ Provide handouts, self-made tutorial video clip, and PPT through Google Classroom.
- ✓ Let the learners submit their responses through Google Classroom or any other relevant social media.

D. **Assessment:**

- ✓ Make learners perform and explain OPERATION SHEET 1.6 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.
- ✓ Conduct class tests to assess their understanding.
- ✓ Let learners carry out activities of SAMPLE SELF CHECK 1.6
- ✓ Let the learners do presentations and assess as per the rubric developed.

- ✓ Make learners read INFORMATION SHEET 1.6 and perform OPERATION SHEET 1.6 and ask them to send the video as evidence through Google Classroom or any other relevant social media platform.
- ✓ Let the learners solve SAMPLE SELF CHECK 1.6 and submit answers through Google Classroom or any other relevant social media.
- ✓ Give additional relevant questions from CBLM and other resources-text/ Google/ YouTube and let learners submit answer through Google Classroom or any other relevant social media

E. **Resources:**

- ✓ Competency-Based Learning Materials
- ✓ https://www.youtube.com/watch?v=iaFPJMiaIGM (demonstates how to draw layout plan of plate earthing)

A. Competency/Competencies:

- ✓ Draw final circuit (SB points) wiring diagram.

B. Learning objectives/Topic:

Learning objectives	**Topic**
1.7.1 Define legend 1.7.2 State the purpose of legend 1.7.3 List the types of wire 1.7.4 List the size of wire 1.7.5 *Ensure clean and neatness of drawing* 1.7.6 *Ensure proper handling of drawing instrumens* 1.7.7 Draw final (SB oints) wiring diagram	1.7 Drawing final circuit (SB points) wiring diagram **Overview:** The topic is about drawing final circuit wiring diagram and it enables the learners draw SB points while designing wiring diagram of a house.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 1.7
- ✓ Provide handouts to learners
- ✓ Demonstrate on OPERATION SHEET 1.7
- ✓ Provide guided practice on OPERATION SHEET 1.7
- ✓ Instruct learners to read INFORMATION SHEET 1.7
- ✓ Make learners watch https://www.youtube.com/watch?v=AJkgdR58Y94 which explains how to draw wiring diagram of final circuit
- ✓ Provide handouts, self-made tutorial video clip, and PPT through Google Classroom.
- ✓ Instruct learners to develop NOR gate truth table
- ✓ Let the learners submit their responses through Google Classroom or any other relevant social media.

D. **Assessment:**

- ✓ Make learners perform and explain OPERATION SHEET 1.7 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.
- ✓ Let learners carry out activities of SAMPLE SELF CHECK 1.7
- ✓ Make learners read INFORMATION SHEET 1.7 and perform OPERATION SHEET 1.7 and ask them to send video as evidence through Google Classroom or any other relevant social media platform.
- ✓ Let the learners solve SAMPLE SELF CHECK 1.7 and submit answers through Google Classroom or any other relevant social media.

E. Resources:

- ✓ Competency-Based Learning Materials
- ✓ https://www.youtube.com/watch?v=AJkgdR58Y94 (Explanation on how to draw wiring diagram of final circuit)

A. Competency/Competencies:

- ✓ Draw SMDB wiring diagram

B. Learning objectives/Topic:

Learning objectives	**Topic**
1.8.1 Define SMDB 1.8.2 State the function of SMDB 1.8.3 *Ensure claen and neatness of drawing* 1.8.4 *Ensure proper handling of drawing instruments* 1.8.5 Draw SMDB wiring diagram	1.8 Drawing SMDB wiring diagram **Overview:** The topic is about drawing SMDB wiring diagram and it enables the learners draw SMDB points while designing wiring diagram of a house.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 1.8
- ✓ Provide handouts
- ✓ Demonstrate on OPERATION SHEET 1.8
- ✓ Provide guided practice on OPERATION SHEET 1.8
- ✓ Instruct learners to read INFORMATION SHEET 1.8
- ✓ Provide link https://www.youtube.com/watch?v=TiEJYQYTz6U which describes how to draw wiring diagram of SMDB
- ✓ Provide handouts, self-made tutorial video clip, and PPT through Google Classroom.
- ✓ Let the learners submit their responses through Google Classroom or any other relevant social media.

D. **Assessment:**

- ✓ Make learners perform and explain OPERATION SHEET 1.8 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.

- ✓ Let learners carry out activities of SAMPLE SELF CHECK 1.8
- ✓ Make learners read INFORMATION SHEET 5.13 and perform OPERATION SHEET 5.13 and ask them to send the video as evidence through Google Classroom or any other relevant social media platform.
- ✓ Let the learners solve SAMPLE SELF CHECK 5.13 and submit answers through Google Classroom or any other relevant social media.

E. Resources:

- ✓ Competency-Based Learning Materials
- ✓ https://www.youtube.com/watch?v=TiEJYQYTz6U (Explanation on SMDB wiring)

A. Competency/Competencies:

- ✓ Draw MDB wiring diagram

B. Learning objectives/Topic:

Learning objectives	Topic
1.9.1 Define MDB 1.9.2 State the function of MDB 1.9.3 *Ensure clean and neatness of drawing* 1.9.4 *Ensure proper handling of drawing instruments*	1.9 Drawing MDB wiring diagram **Overview:** The topic is about drawing MDB wiring diagram and it enables the learners interpret and draw MDB wiring diagram.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 1.9
- ✓ Provide handouts to learners
- ✓ Demonstrate on OPERATION SHEET 1.9
- ✓ Provide guided practice on OPERATION SHEET 1.9
- ✓ Instruct learners to read INFORMATION SHEET 1.9
- ✓ Provide the web link https://www.youtube.com/watch?v=j5Iruf6aJi8 that explains designing of SMDB
- ✓ Provide handouts, self-made tutorial video clip, and PPT through Google Classroom.
- ✓ Let the learners submit their responses through Google Classroom or any other relevant social media.

D. **Assessment:**

- ✓ Make learners perform and explain OPERATION SHEET 1.9 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.
- ✓ Conduct class test to assess their understanding
- ✓ Let learners carry out activities of SAMPLE SELF CHECK 1.9

- ✓ Make learners read INFORMATION SHEET 1.9 and perform OPERATION SHEET 1.9 and ask them to send the video as evidence through Google Classroom.
- ✓ Let the learners solve SAMPLE SELF CHECK 1.9 and submit answers through Google Classroom or any other relevant social media.
- ✓ Give additional relevant questions from CBLM and other resources-text/ Google/ YouTube and let learners submit answer through Google Classroom or any other relevant social media

E. Resources:

- ✓ Competency-Based Learning Materials
- ✓ https://www.youtube.com/watch?v=j5Iruf6aJi8 (Explanation of SMDB)

A. Competency/Competencies:

- ✓ Draw and interpret staircase wiring diagram

B. Learning objectives/Topic:

Learning objectives	Topic
1.10.1 State the application of staircase wiring *1.10.2 Use multimeter.* *1.10.3 Ensure clean and neatness of drawing* 1.10.4 *Ensure proper handling of drawing instruments*	1.10 Drawing staircase wiring **Overview:** The topic is about drawing staircase wiring and it enables the learners interpret and draw staircase wiring.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 1.10
- ✓ Provide handouts
- ✓ Demonstrate on OPERATION SHEET 1.10
- ✓ Provide guided practice on OPERATION SHEET 1.10
- ✓ Make learners perform OPERATION SHEET 1.10
- ✓ Instruct learners to read INFORMATION SHEET 1.10
- ✓ Provide web link https://www.youtube.com/watch?v=WqkQps9DJTE to the learners that explain how to draw staircase wiring diagram
- ✓ Provide handouts, self-made tutorial video clip, and PPT through Google Classroom.
- ✓ Let the learners submit their responses through Google Classroom or any other relevant social media.

D. **Assessment:**

- ✓ Make learners perform and explain OPERATION SHEET 1.10 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.

- ✓ Assess learner's knowledge about washing electric heater by asking questions
- ✓ Let learners carry out activities of SAMPLE SELF CHECK 1.10
- ✓ Let learners solve SAMPLE SELF CHECK 1.10 and submit answers through Google Classroom or any other relevant social media.
- ✓ Give additional relevant questions from CBLM and other resources-text/ Google/ YouTube and let learners submit answer through Google Classroom or any other relevant social media

E. **Resources:**

- ✓ Handouts
- ✓ Competency-Based Learning Materials
- ✓ https://www.youtube.com/watch?v=WqkQps9DJTE (drawing wiring diagram of staircase wiring)

A. Competency/Competencies:

- ✓ Draw godown wiring diagram

B. Learning objectives/Topic:

Learning objectives	**Topic**
1.11.1 State the application of godown wiring *1.11.2 Ensure clean and neatness of drawing* 1.11.3 *Ensure proper handling of drawing instruments*	1.11 Drawing godown wiring **Overview:** The topic is about drawing godown wiring diagram and it enables the learners interpret and draw godown wiring diagram.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 1.11
- ✓ Provide handouts to learners
- ✓ Demonstrate on OPERATION SHEET 1.11
- ✓ Provide guided practice on OPERATION SHEET 1.11
- ✓ Make learners perform OPERATION SHEET 1.11
- ✓ Instruct learners to read INFORMATION SHEET 1.11
- ✓ Provide a web link https://www.youtube.com/watch?v=4KecjmatYqs to learners which explains godown wiring diagram
- ✓ Provide handouts, self-made tutorial video clip, and PPT through Google Classroom.
- ✓ Let the learners submit their responses through Google Classroom or any other relevant social media.

D. Assessment:

- ✓ Make learners perform and explain OPERATION SHEET 1.11 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.

- ✓ Let learners carry out activities of SAMPLE SELF CHECK 1.11
- ✓ Let learners solve SAMPLE SELF CHECK 1.11 and submit answers through Google Classroom or any other relevant social media.
- ✓ Give additional relevant questions from CBLM and other resources-text/ Google/ YouTube and let learners submit answer through Google Classroom or any other relevant social media

E. **Resources:**

- ✓ Handouts
- ✓ Competency-Based Learning Materials
- ✓ https://www.youtube.com/watch?v=4KecjmatYqs (Explains godown wiring diagram)

MODULE 3: Carrying ouy installation of security and communication system

Chapter 1: Install security system

A. Competency/Competencies:

- ✓ Prepare BNC connector

B. Learning objectives/Topic:

Learning objectives	Topic
1.1.1 List the types of BNC 1.1.2 List the application of BNC 1.1.3 List the types of coaxial cable 1.1.4 Explain constructional parts of BNC 1.1.5 Explain construcatonal parts of coaxial cable 1.1.6 State the importance of using BNC 1.1.7 *Use BNC crimping tool* 1.1.8 Prepare Bio-net connector	1.1 Preparing bio-net connector **Overview:** The topic is about preparing BNC connector and it highlights the types and construction of BNC and coaxial cable. It enables the learners to prepare BNC connector.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 1.1
- ✓ Provide handouts to learners
- ✓ Demonstrate on OPERATION SHEET 1.1
- ✓ Provide guided practice on OPERATION SHEET 1.1
- ✓ Make learners perform OPERATION SHEET 1.1
- ✓ Instruct learners to read INFORMATION SHEET 1.1
- ✓ Share link https://www.youtube.com/watch?v=mTbLfBDZ5ZM which explains about the preparing BNC connector
- ✓ Provide handouts, self-made tutorial video clip, and PPT through Google Classroom.
- ✓ Let the learners submit their responses through Google Classroom or any other relevant social media.

D. **Assessment:**

- ✓ Make learners perform and explain OPERATION SHEET 1.1 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.
- ✓ Let learners carry out activities of SAMPLE SELF CHECK 1.1
- ✓ Let learners solve SAMPLE SELF CHECK 1.1 and submit answers through Google Classroom or any other relevant social media.
- ✓ Give additional relevant questions from CBLM and other resources-text/ Google/ YouTube and let learners submit answer through Google Classroom or any other relevant social media

E. Resources:

- ✓ Handout
- ✓ Competency-Based Learning Materials for class XI
- ✓ https://www.youtube.com/watch?v=mTbLfBDZ5ZM (Explains about the preparing BNC connector)

A. Competency/Competencies:

- ✓ Install CCTV

B. Learning objectives/Topic:

Learning objectives	Topic
1.2.1 Define security system 1.2.2 List the types of security system 1.2.3 List the types of CCTV system 1.2.4 State the application of CCTV 1.2.5 List the components of CCTV system 1.2.6 Explain the function of each component in a CCTV system 1.2.7 List the types and features of CCTV camera 1.2.8 List the types and types of CCTV recorder 1.2.9 State the importance of security system 1.2.10 Explain the consequences of inappropriate selection and location of camera *1.2.11 Interpret drawing* *1.2.12 Use multimeter* *1.2.13 Use drilling machine*	1.2 Installing CCTV **Overview:** The topic is about installing CCTV and it explains security system, components of CCTV and its function. It enables the user to install CCTV efficiently.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 1.2
- ✓ Provide handouts to learners
- ✓ Demonstrate on OPERATION SHEET 1.2
- ✓ Provide guided practice on OPERATION SHEET 1.2
- ✓ Make learners perform OPERATION SHEET 1.2
- ✓ Instruct learners to read INFORMATION SHEET 1.2
- ✓ Share link https://www.youtube.com/watch?v=2vKMaT5icmo which explains how to install CCTV
- ✓ Provide handouts, self-made tutorial video clip, and PPT through Google Classroom.
- ✓ Let the learners submit their responses through Google Classroom or any other relevant social media.

D. **Assessment:**

- ✓ Make learners perform and explain OPERATION SHEET 1.2 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.
- ✓ Assess learner's knowledge about PV panel under different inclinations by asking questions
- ✓ Let learners carry out activities of SAMPLE SELF CHECK 1.2
- ✓ Let learners solve SAMPLE SELF CHECK 1.2 and submit answers through Google Classroom or any other relevant social media.
- ✓ Give additional relevant questions from CBLM and other resources-text/ Google/ YouTube and let learners submit answer through Google Classroom or any other relevant social media

E. **Resources:**

- ✓ Handout
- ✓ Competency-Based Learning Materials
- ✓ https://www.youtube.com/watch?v=2vKMaT5icmo (demonstration of CCTV installation)

A. Competency/Competencies:

- ✓ Interpret typical drawing and install burglar alarm

B. Learning objectives/Topic:

Learning objectives	**Topic**
1.3.1 Define burglar alarm 1.3.2 List the components of burglar alarm 1.3.3 List the types of burglar alarm system 1.3.4 List the types of alarms and sensors 1.3.5 Explain typical alaram circuit diagram *1.3.6 Use multimeter.* *1.3.7 Interpret drawing* 1.3.8 *Use drilling machine* 1.3.9 Install burglar alarm	1.3 Installing burglar alarm **Overview:** The topic is about installing burglar alarm and it enables the user to install burglar alarm efficiently.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 1.3
- ✓ Provide handouts
- ✓ Demonstrate on OPERATION SHEET 71.3
- ✓ Provide guided practice on OPERATION SHEET 1.3
- ✓ Make learners perform OPERATION SHEET 1.3
- ✓ Instruct learners to read INFORMATION SHEET 1.3

- ✓ Provide web link https://www.youtube.com/watch?v=tliaCS9jkrY with learners which explains how to install burglar alarm
- ✓ Provide handouts, self-made tutorial video clip, and PPT through Google Classroom.
- ✓ Let the learners submit their responses through Google Classroom or any other relevant social media.

D. **Assessment:**

- ✓ Make learners perform and explain OPERATION SHEET 1.3 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.
- ✓ Let learners carry out activities of SAMPLE SELF CHECK 1.3
- ✓ Let learners solve SAMPLE SELF CHECK 1.3 and submit answers through Google Classroom or any other relevant social media.
- ✓ Give additional relevant questions from CBLM and other resources-text/ Google/ YouTube and let learners submit answer through Google Classroom or any other relevant social media

E. **Resources:**

- ✓ Competency-Based Learning Materials
- ✓ https://www.youtube.com/watch?v=tliaCS9jkrY (Explanation on installation of burglar alarm)

A. Competency/Competencies:

- ✓ Interpret drawing and install siren/hooter while installing security system at any place.

B. Learning objectives/Topic:

Learning objectives	**Topic**
1.4.1 Define hooter and siren 1.4.2 List the types of hooter and siren 1.4.3 State the application of hooter and siren *1.4.4 Use multimeter.* 1.4.5 *Interpret drawing* 1.4.6 *Use drilling machine* 1.4.7 Install hooter/siren	1.4 Installing hooter/siren **Overview:** The topic explains about hooter/siren and it enables the learners to install siren while installing security system

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 1.4
- ✓ Provide handouts
- ✓ Demonstrate on OPERATION SHEET 1.4
- ✓ Provide guided practice on OPERATION SHEET 1.4
- ✓ Make learners perform OPERATION SHEET 1.4
- ✓ Instruct learners to read INFORMATION SHEET 1.4

- ✓ Provide web link https://www.youtube.com/watch?v=_DKUGXhKst4 with learners which demonstrates on installation of siren/hooter.
- ✓ Provide handouts, self-made tutorial video clip, and PPT through Google Classroom.
- ✓ Let the learners submit their responses through Google Classroom or any other relevant social media.

D. **Assessment:**

- ✓ Make learners perform and explain OPERATION SHEET 1.4 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.
- ✓ Let learners carry out activities of SAMPLE SELF CHECK 1.4
- ✓ Let learners solve SAMPLE SELF CHECK 1.4 and submit answers through Google Classroom or any other relevant social media.
- ✓ Give additional relevant questions from CBLM and other resources-text/ Google/ YouTube and let learners submit answer through Google Classroom or any other relevant social media

E. **Resources:**

- ✓ Competency-Based Learning Materials.
- ✓ Handouts
- ✓ https://www.youtube.com/watch?v=_DKUGXhKst4 (demonstration of installation of siren/hooter)

A. Competency/Competencies:

- ✓ Interpret drawing and install fire alarm.

B. Learning objectives/Topic:

Learning objectives	**Topic**
1.5.1 Define fire alarm 1.5.2 List the types of fire alarm 1.5.3 List the types of sensors and detectors 1.5.4 Select location of fire alarm 1.5.5 *Use drilling machine* 1.5.6 Install fire alarm	1.5 Installing fire alarm **Overview:** The topic explains about types of fire alarm and it enables the learners to install fire alarm while installing security system.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 1.5
- ✓ Provide handouts to learners
- ✓ Demonstrate on OPERATION SHEET 1.5
- ✓ Provide guided practice on OPERATION SHEET 1.5
- ✓ Make learners perform OPERATION SHEET 1.5
- ✓ Instruct learners to read INFORMATION SHEET 1.5

- ✓ Provide the web link https://www.youtube.com/watch?v=cVjyDgFrb2g which explains about fire alarm and its installation.
- ✓ Provide handouts, self-made tutorial video clip, and PPT through Google Classroom.
- ✓ Let the learners submit their responses through Google Classroom or any other relevant social media.

D. **Assessment:**

- ✓ Make learners perform and explain OPERATION SHEET 1.5 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.
- ✓ Assess learner's knowledge about Solar battery by asking questions
- ✓ Let learners carry out activities of SAMPLE SELF CHECK 1.5
- ✓ Let learners solve SAMPLE SELF CHECK 1.5 and submit answers through Google Classroom or any other relevant social media.
- ✓ Give additional relevant questions from CBLM and other resources-text/ Google/ YouTube and let learners submit answer through Google Classroom or any other relevant social media

E. **Resources:**

- ✓ Competency-based Learning Materials for class XI
- ✓ https://www.youtube.com/watch?v=cVjyDgFrb2g (installation of fire alarm)

Chapter 2: Install communication system

A. Competency/Competencies:

- ✓ Prepare LAN cable while installing communication system

B. Learning objectives/Topic:

Learning objectives	Topic
2.1.1 Define communication system 2.1.2 List the types of communication system 2.1.3 List the types of communication cable 2.1.4 State the difference between RJ11 and RJ45 connector 2.1.5 State the function of individual pins 2.1.6 List the types of LAN cable connection 2.1.7 List the types of LAN cable 2.1.8 State the application of LAN cable 2.1.9 *Use LAN cable tester* 2.1.10 *Use LAN crimping tools* 2.1.11 Prepare LAN cable	2.1 Preparing local area network cable **Overview:** The topic explains about the types of communication system and it enables the learners to prepare LAN cable while installing communication system.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 2.1
- ✓ Provide handouts
- ✓ Demonstrate on OPERATION SHEET 2.1
- ✓ Provide guided practice on OPERATION SHEET 2.1
- ✓ Make learners perform OPERATION SHEET 2.1
- ✓ Instruct learners to read INFORMATION SHEET 2.1
- ✓ Provide web link https://www.youtube.com/watch?v=Uw8FSXx4dnU which explains about preparing LAN cable
- ✓ Provide handouts, self-made tutorial video clip, and PPT through Google Classroom.
- ✓ Let the learners submit their responses through Google Classroom or any other relevant social media.

D. **Assessment:**

- ✓ Make learners perform and explain OPERATION SHEET 2.1 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.
- ✓ Let learners carry out activities of SAMPLE SELF CHECK 2.1
- ✓ Let learners solve SAMPLE SELF CHECK 2.1 and submit answers through Google Classroom or any other relevant social media.
- ✓ Give additional relevant questions from CBLM and other resources-text/ Google/ YouTube and let learners submit answer through Google Classroom or any other relevant social media

E. **Resources:**

- ✓ Handouts
- ✓ Competency-Based Learning Materials
- ✓ https://www.youtube.com/watch?v=Uw8FSXx4dnU (Explanation on preparing LAN cable)

A. Competency/Competencies:

- ✓ Install I/O box while installing communication system

B. Learning objectives/Topic:

Learning objectives	Topic
2.2.1 Read colour coding of modular jack 2.2.2 State the purpose of I/O box 2.2.3 *Use impact tool* 2.2.4 Install I/O box	2.2 Installing I/O box **Overview:** The topic explains the colour coding of modular jack and it enables the learners to install I/O while installing communication system.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 2.2
- ✓ Provide handouts
- ✓ Demonstrate on OPERATION SHEET 2.2
- ✓ Provide guided practice on OPERATION SHEET 2.2
- ✓ Make learners perform OPERATION SHEET 2.2
- ✓ Instruct learners to read INFORMATION SHEET 2.2
- ✓ Provide web link https://www.youtube.com/watch?v=CLukEshaznU with learners which explain how to install I/O box.
- ✓ Provide handouts, self-made tutorial video clip, and PPT through Google Classroom.
- ✓ Let the learners submit their responses through Google Classroom or any other relevant social media.

D. Assessment:

- ✓ Make learners perform and explain OPERATION SHEET 2.2 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.
- ✓ Assess learner's knowledge about solar controller by asking questions
- ✓ Let learners carry out activities of SAMPLE SELF CHECK 2.2
- ✓ Let learners solve SAMPLE SELF CHECK 2.2 and submit answers through Google Classroom or any other relevant social media.
- ✓ Give additional relevant questions from CBLM and other resources-text/ Google/ YouTube and let learners submit answer through Google Classroom or any other relevant social media

E. Resources:

- ✓ Handouts
- ✓ Competency-Based Learning Materials.
- ✓ https://www.youtube.com/watch?v=CLukEshaznU (installing I/O box)

A. Competency/Competencies:

- ✓ Prepare balun plug while installing communication system

B. Learning objectives/Topic:

Learning objectives	Topic
2.3.1 List the types of coaxial cable 2.3.2 List the types of balun plug 2.3.3 State the application of balun plug 2.3.4 *Use multimeter* 2.3.5 Prepare balun plug	2.3 Preparing balun plug **Overview:** The topic explains the types balun plug and it enables the learners to prepare balun plug while installing communication system.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 2.3
- ✓ Provide handouts to learners
- ✓ Demonstrate on OPERATION SHEET 2.3
- ✓ Provide guided practice on OPERATION SHEET 2.3
- ✓ Make learners perform OPERATION SHEET 2.3
- ✓ Instruct learners to read INFORMATION SHEET 2.3
- ✓ Provide web link https://www.youtube.com/watch?v=FsnG-8UuiU4 with learners which explains preparation of balun plug.
- ✓ Provide handouts, self-made tutorial video clip, and PPT through Google Classroom.
- ✓ Let the learners submit their responses through Google Classroom or any other relevant social media.

D. **Assessment:**

- ✓ Make learners perform and explain OPERATION SHEET 2.3 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.
- ✓ Assess learner's knowledge about solar inverter by asking questions
- ✓ Let learners carry out activities of SAMPLE SELF CHECK 2.3
- ✓ Let learners solve SAMPLE SELF CHECK 2.3 and submit answers through Google Classroom or any other relevant social media.
- ✓ Give additional relevant questions from CBLM and other resources-text/ Google/ YouTube and let learners submit answer through Google Classroom or any other relevant social media

E. Resources:

- ✓ Handouts
- ✓ Competency-Based Learning Materials.
- ✓ https://www.youtube.com/watch?v=FsnG-8UuiU4 (prepare balun plug)

A. Competency/Competencies:

- ✓ Connect RF connector while installing communication system

B. Learning objectives/Topic:

Learning objectives	Topic
2.4.1 List the types of RF connector 2.4.2 State the purpose of RF connector 2.4.3 State the application of RF connector 2.4.4 *Use crimping tools* 2.4.5 Connect radio frequency connector	2.4 Connecting radio frequency connector **Overview:** The topic explains about the RF connector and it enables the learners to connect RF connector while installing communication system.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 2.4
- ✓ Provide handouts to learners
- ✓ Demonstrate on OPERATION SHEET 2.4
- ✓ Provide guided practice on OPERATION SHEET 2.4
- ✓ Make learners perform OPERATION SHEET 2.4
- ✓ Instruct learners to read INFORMATION SHEET 2.4
- ✓ Provide link https://www.youtube.com/watch?v=ol36eqfEtlw which explains about how to connect RF connector
- ✓ Provide handouts, self-made tutorial video clip, and PPT through Google Classroom.
- ✓ Let the learners submit their responses through Google Classroom or any other relevant social media.

D. **Assessment:**

- ✓ Make learners perform and explain OPERATION SHEET 2.4 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.
- ✓ Assess learner's knowledge about solar inverter by asking questions
- ✓ Let learners carry out activities of SAMPLE SELF CHECK 2.
- ✓ Let learners solve SAMPLE SELF CHECK 2.4 and submit answers through Google Classroom or any other relevant social media.
- ✓ Give additional relevant questions from CBLM and other resources-text/ Google/ YouTube and let learners submit answer through Google Classroom or any other relevant social media

E. Resources:

- ✓ Handouts
- ✓ Competency-Based Learning Materials
- ✓ https://www.youtube.com/watch?v=ol36eqfEtlw (Explains about how to connect RF connector)

A. Competency/Competencies:

- ✓ Install TV socket

B. Learning objectives/Topic:

Learning objectives	Topic
2.5.1 List the types and size if coaxial cable 2.5.2 State the standard installation rules 2.5.3 ***Use drilling machine*** 2.5.4 Install TV socket	2.5 Installing TV socket **Overview:** The topic explains about the TV socket and its installation rules and it enables the learners to install TV socket.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 2.5
- ✓ Provide handouts to learners
- ✓ Demonstrate on OPERATION SHEET 2.5
- ✓ Provide guided practice on OPERATION SHEET 2.5
- ✓ Make learners perform OPERATION SHEET 2.5
- ✓ Instruct learners to read INFORMATION SHEET 2.5
- ✓ Share link https://www.youtube.com/watch?v=FeVDkQkt-_Y with the learners which explains the installation of TV socket.
- ✓ Provide handouts, self-made tutorial video clip, and PPT through Google Classroom.
- ✓ Let the learners submit their responses through Google Classroom or any other relevant social media.

D. **Assessment:**

- ✓ Make learners perform and explain OPERATION SHEET 2.5 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.
- ✓ Assess learner's knowledge about solar inverter by asking questions
- ✓ Let learners carry out activities of SAMPLE SELF CHECK 2.5
- ✓ Let learners solve SAMPLE SELF CHECK 2.5 and submit answers through Google Classroom or any other relevant social media.
- ✓ Give additional relevant questions from CBLM and other resources-text/ Google/ YouTube and let learners submit answer through Google Classroom or any other relevant social media

E. Resources:

- ✓ Handouts
- ✓ Competency-Based Learning Materials.
- ✓ https://www.youtube.com/watch?v=FeVDkQkt-_Y (Explains the installation of TV socket)

Chapter 3: Test security and communication system

A. Competency/Competencies:

- ✓ Test BNC connector while connecting BNC connector

B. Learning objectives/Topic:

Learning objectives	Topic
3.1.1 State the purpose of coaxial cable 3.1.2 *Use multimeter* 3.1.3 Test BNC connector	3.1 Testing BNC connector **Overview:** It is about the purpose of coaxial cable and it enables the user to test the BNC connector efficiently.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 3.1
- ✓ Provide handouts to learners
- ✓ Demonstrate on OPERATION SHEET 3.1
- ✓ Provide guided practice on OPERATION SHEET 3.1
- ✓ Make learners perform OPERATION SHEET 3.1
- ✓ Instruct learners to read INFORMATION SHEET 3.1 through Google Classroom
- ✓ Provide the web link https://www.youtube.com/watch?v=5hJxh166TEw that explains the steps on how to test BNC connector
- ✓ Provide handouts, self-made tutorial video clip and PPT through Google Classroom.
- ✓ Let learners submit their response through Google Classroom or any other relevant social media
- ✓ Conduct online test

D. **Assessment:**

- ✓ Make learners to perform and explain OPERATION SHEET 3.1 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.
- ✓ Assess learner's knowledge about transistor by asking questions
- ✓ Conduct class test to assess their understanding
- ✓ Let learners carry out activities of the SAMPLE SELF CHECK 3.1
- ✓ Let the learners solve SAMPLE SELF CHECK 3.1 and submit answers through google
- ✓ classroom or any other relevant social media.

E. **Resources:**

- ✓ Competency-Based Learning Materials
- ✓ Handouts
- ✓ https://www.youtube.com/watch?v=5hJxh166TEw (Explains the steps on how to test BNC connector)

A. Competency/Competencies:

- ✓ Test modular jack

B. Learning objectives/Topic:

Learning objectives	Topic
3.2.1 State the purpose of testing modular jack 3.2.2 *Use cable tester* 3.2.3 Test modular jack	3.2 Testing modular jack **Overview:** The topic explains about the purpose of testing the modular jack and it enables the learners to test the modular jack.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 3.2
- ✓ Provide handouts to learners
- ✓ Demonstrates on OPERATION SHEET 3.2
- ✓ Provide guided practice on OPERATION SHEET 3.2
- ✓ Make learners perform OPERATION SHEET 3.2
- ✓ Instruct learners to read INFORMATION SHEET 3.2
- ✓ Provide Share the web link https://www.youtube.com/watch?v=VU9cnb6tt3o with
- ✓ learners which explains the process of testing modular jack
- ✓ Provide handouts, self-made tutorial video clip and PPT through Google Classroom

D. **Assessment:**

- ✓ Make learners perform and explain OPERATION SHEET 3.2 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.
- ✓ Assess learner's knowledge about transistor as an amplifier by asking questions
- ✓ Conduct class test to assess their understanding
- ✓ Let learners carry out activities of the SAMPLE SELF CHECK 3.2
- ✓ Let the learners solve SAMPLE SELF CHECK 1.2 and submit answers through Google Classroom or any other relevant social media.
- ✓ Give additional relevant questions from CBLM and other resources-text/ Google/ YouTube and let learners submit answers through Google Classroom or any other relevant social media.

E. **Resources:**

- ✓ Competency-Based learning materials
- ✓ Handouts
- ✓ https://www.youtube.com/watch?v=VU9cnb6tt3o (Explains the process of testing modular jack)

A. Competency/Competencies:

- ✓ Test LAN cable

B. Learning objectives/Topic:

Learning objectives	Topic
3.3.1 State the purpose of LAN cable testing 3.3.2 State the application of cross and straight-thru connection 3.3.3 *Use LAN tester* 3.3.4 Test LAN cable	3.3 Testing LAN cable **Overview:** The topic explains on the purpose of testing LAN cable and it enables the learners to test LAN cable.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 3.3
- ✓ Provide handouts to learners
- ✓ Demonstrates on OPERATION SHEET 3.3
- ✓ Provide guided practice on OPERATION SHEET 3.3
- ✓ Make learners perform OPERATION SHEET 3.3
- ✓ Let the learners discuss in the group and share their responses among them
- ✓ Instruct learners to read INFORMATION SHEET 3.3 through Google Classroom
- ✓ Provide handouts, self-made tutorial video clip, and PPT through Google Classroom.
- ✓ Share link https://www.youtube.com/watch?v=3tHvOLBp2zM which explains the process of testing LAN cable
- ✓ Let the learners submit their responses through Google Classroom or any other relevant social media.

D. **Assessment:**

- ✓ Make learners perform and explain OPERATION SHEET 3.3 and use rubric (Available in framework 2022) to assess them. Provide necessary feedback.
- ✓ Let learners carry out activities of the SAMPLE SELF CHECK 3.3
- ✓ Let the learners solve SAMPLE SELF CHECK 3.3 and submit answers through Google Classroom or any other relevant social media.
- ✓ Give additional relevant questions from CBLM and other resources-text/ Google/ YouTube and let learners submit answers through Google Classroom or any other relevant social media.

E. Resources:

- ✓ Handouts
- ✓ Competency-Based Learning Materials
- ✓ https://www.youtube.com/watch?v=3tHvOLBp2zM (Explains the process of testing LAN cable)

A. Competency/Competencies:

- ✓ Troubleshoot and operate fire alarm

B. Learning objectives/Topic:

Learning objectives	Core concepts(Chapters/Topics)
3.4.1 State the purpose of smoke detector 3.4.2 List types of smoke detector 3.4.4 State the purpose testing of fire alarm 3.4.5 Troubleshoot problems associated with smoke detector 3.4.6 *Operate fire detector* 1.4.5 Test fire alarm	3.4 Testing fire alarm **Overview:** The topic is about fire alarm, its purposes and the problems associated with the alarm system. It enables the learners to trouble shoot and operate fire alarm.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 3.4
- ✓ Provide handouts to learners
- ✓ Demonstrate on OPERATION SHEET 3.4
- ✓ Provide guided practice on OPERATION SHEET 3.4
- ✓ Make learners perform OPERATION SHEET 3.4
- ✓ Instruct learners to read INFORMATION SHEET 3.4 through Google Classroom
- ✓ Provide handouts, self-made tutorial video clip, and PPT through Google Classroom.
- ✓ Let the learners submit their responses through Google Classroom or any other relevant social media.

D. **Assessment:**

- ✓ Make learners perform and explain OPERATION SHEET 3.4 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.
- ✓ Conduct a test to assess their understanding.
- ✓ Let learners carry out activities of the SAMPLE SELF CHECK 3.4
- ✓ Let the learners solve SAMPLE SELF CHECK 3.4 and submit answers through Google Classroom or any other relevant social media.
- ✓ Give additional relevant questions from CBLM and other resources-text/ Google/ YouTube and let learners submit answer through Google Classroom or any other relevant social media

E. **Resources:**

- ✓ Competency-Based Learning Materials
- ✓ Handouts

A. Competency/Competencies:

- ✓ Test burglar alarm

B. Learning objectives/Topic:

Learning objectives	Topic
3.5.1 State the importance of testing burglar alarm 3.5.2 *Operate burglar alarm* 3.5.3 Test burglar alarm	3.5 Testing burglar alarm **Overview:** The topic explains about the purpose of testing the burglar alarm and it enables the learners to test burglar alarm while installing it.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 3.5
- ✓ Provide handouts to learners
- ✓ Demonstrate on OPERATION SHEET 3.5
- ✓ Provide guided practice on OPERATION SHEET 3.5
- ✓ Make learners perform OPERATION SHEET 3.5
- ✓ Instruct learners to read INFORMATION SHEET 3.5
- ✓ Provide the web link https://www.youtube.com/watch?v=16BOxVNVk0U which gives an explanation on how to test burglar alarm
- ✓ Provide handouts, self-made tutorial video clip, and PPT through Google Classroom.
- ✓ Let the learners submit their responses through Google Classroom or any other relevant social media.

D. **Assessment:**

- ✓ Make learners Perform and explain OPERATION SHEET 3.5 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.
- ✓ Let learners carry out activities of SAMPLE SELF CHECK 3.5
- ✓ Make learners read INFORMATION SHEET 33.5 and perform OPERATION SHEET 5.10 and ask them to send the short video as evidence through Google Classroom or any other relevant social media platform. Assess them using the checklist/performance guide.
- ✓ Let the learners solve SAMPLE SELF CHECK 3.5 and submit answers through Google Classroom or any other relevant social media.
- ✓ Give additional relevant questions from CBLM and other resources-text/ Google/ YouTube and let learners submit answer through Google Classroom or any other relevant social media

E. **Resources:**

- ✓ Competency-Based Learning Materials
- ✓ https://www.youtube.com/watch?v=16BOxVNVk0U (Explanation on how to test burglar alarm)

A. Competency/Competencies:

- ✓ Test CCTV

B. Learning objectives/Topic:

Learning objectives	Topic
3.6.1 State the importance of testing CCTV system 3.6.2 ***Operate CCTV system*** 3.6.3 Test CCTV	3.6 Testing CCTV **Overview:** The topic explains about the importance of testing CCTV system and it enables the learners to test CCTV.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 3.6
- ✓ Provide handouts to learners
- ✓ Demonstrate on OPERATION SHEET 3.6
- ✓ Provide guided practice on OPERATION SHEET 3.6
- ✓ Instruct learners to read INFORMATION SHEET 3.6 through Google Classroom.
- ✓ Share the web link https://www.youtube.com/watch?v=drh5kL7fu8Y which demonstrates how to test CCTV
- ✓ Provide handouts, self-made tutorial video clip, and PPT through Google Classroom.
- ✓ Let the learners submit their responses through Google Classroom or any other relevant social media.

D. **Assessment:**

- ✓ Make learners perform and explain OPERATION SHEET 3.6 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.
- ✓ Conduct class tests to assess their understanding.
- ✓ Let learners carry out activities of SAMPLE SELF CHECK 3.6
- ✓ Let the learners do presentations and assess as per the rubric developed.
- ✓ Make learners read INFORMATION SHEET 3.6 and perform OPERATION SHEET 1.6 and ask them to send the video as evidence through Google Classroom or any other relevant social media platform.
- ✓ Let the learners solve SAMPLE SELF CHECK 3.6 and submit answers through Google Classroom or any other relevant social media.
- ✓ Give additional relevant questions from CBLM and other resources-text/ Google/ YouTube and let learners submit answer through Google Classroom or any other relevant social media

E. **Resources:**

- ✓ Competency-Based Learning Materials
- ✓ https://www.youtube.com/watch?v=drh5kL7fu8Y (demonstrates how to test CCT)

MOUDLE 4: Carrying out domestic wiring

Chapter 1: Prepare wire joints

A. Competency/Competencies:

- ✓ Use rat tail joint during house wiring and maintenance work

B. Learning objectives/Topic:

Learning objectives	Topic
1.1.1 List types of wires 1.1.2 State types of wire joints 1.1.3 State the purpose of joints 1.1.4 Explain the importance of proper insulation 1.1.5 State the consequences of improper joints and insulation 1.1.6 State the application of rat tail joints 1.1.7 *Use of wire stripper* 1.1.8 *Use of soldering iron* 1.1.9 *Use insulation sleeves* 1.1.10 *Be responsible and vigilant while following OHS.* 1.1.11 *Ensure safe handling of materials and equipment.* 1.1.12 Prepare rat tail joint	1.1 Preparing rat tail joint **Overview:** The topic is about different types of wire joints and their purposes. It enables learners to prepare rat tail joint during house wiring and maintenance.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 1.1
- ✓ Provide handouts to learners
- ✓ Demonstrate on OPERATION SHEET 1.1
- ✓ Provide guided practice on OPERATION SHEET 1.1
- ✓ Instruct learners to read INFORMATION SHEET 1.1
- ✓ Make learners watch https://www.youtube.com/watch?v=F-_O2x6GFQA which will help learners get more idea about how to make different wire joints.
- ✓ Provide handouts, self-made tutorial video clip, and PPT through Google Classroom.
- ✓ Let the learners submit their responses through Google Classroom or any other relevant social media.

D. **Assessment:**

- ✓ Make learners perform and explain OPERATION SHEET 1.1 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.
- ✓ Let learners carry out activities of SAMPLE SELF CHECK 1.1

- ✓ Make learners read INFORMATION SHEET 1.1 and perform OPERATION SHEET 1.1 and ask them to send video as evidence through Google Classroom or any other relevant social media platform.
- ✓ Let the learners solve SAMPLE SELF CHECK 1.1 and submit answers through Google Classroom or any other relevant social media.

E. Resources:

- ✓ Competency-Based Learning Materials
- ✓ https://www.youtube.com/watch?v=F-_O2x6GFQA (shows how to make wire joints)

A. Competency/Competencies:

- ✓ Use T-joint during house wiring and maintenance work

B. Learning objectives/Topic:

Learning objectives	Topic
1.2.1 State the application of T-Joints 1.2.2 *Use wire stripper* 1.2.3 *Use Insulation sleeves* 1.2.4 *Use soldering iron* 1.2.5 *Be responsible and vigilant while following OHS* 1.2.6 *Ensure safe handling of materials and equipment.* 1.2.7 Prepare T-joint	1.2 Preparing T-Joint **Overview:** The topic explains about T-joints and their application. It enables learners to prepare T-joint during house wiring and maintenance.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 1.2
- ✓ Provide handouts to learners
- ✓ Demonstrate on OPERATION SHEET 1.2
- ✓ Provide guided practice on OPERATION SHEET 1.2
- ✓ Instruct learners to read INFORMATION SHEET 1.2
- ✓ Make learners watch https://www.youtube.com/watch?v=F-_O2x6GFQA which will help learners get more idea about how to make different wire joints.
- ✓ Provide handouts, self-made tutorial video clip, and PPT through Google Classroom.
- ✓ Let the learners submit their responses through Google Classroom or any other relevant social media.

D. **Assessment:**

- ✓ Make learners perform and explain OPERATION SHEET 1.2 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.
- ✓ Let learners carry out activities of SAMPLE SELF CHECK 1.2
- ✓ Make learners read INFORMATION SHEET 1.2 and perform OPERATION SHEET 1.1 and ask them to send video as evidence through Google Classroom or any other relevant social media platform.

- ✓ Let the learners solve SAMPLE SELF CHECK 1.2 and submit answers through Google Classroom or any other relevant social media.

E. Resources:

- ✓ Competency-Based Learning Materials
- ✓ https://www.youtube.com/watch?v=F-_O2x6GFQA (Shows how to make wire joints)

A. Competency/Competencies:

- ✓ Use straight joint during house wiring and maintenance work

B. Learning objectives/Topic:

Learning objectives	Topic
1.2.1 State the application of Staraight Joints 1.2.2 ***Use wire stripper*** 1.2.3 ***Use Insulation sleeves*** 1.2.4 ***Use soldering iron*** 1.2.5 *Be responsible and vigilant while following OHS* 1.2.6 *Ensure safe handling of materials and equipment* 1.2.7 Prepare straight joint	1.3 Preparing Straight Joint **Overview:** The topic explains about straight joint and their application. It enables learners to prepare T-joint during house wiring and maintenance.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 1.3
- ✓ Provide handouts to learners
- ✓ Demonstrate on OPERATION SHEET 1.3
- ✓ Provide guided practice on OPERATION SHEET 1.3
- ✓ Instruct learners to read INFORMATION SHEET 1.3
- ✓ Make learners watch https://www.youtube.com/watch?v=F-_O2x6GFQA which will help learners get more idea about how to make different wire joints.
- ✓ Provide handouts, self-made tutorial video clip, and PPT through Google Classroom.
- ✓ Let the learners submit their responses through Google Classroom or any other relevant social media.

D. **Assessment:**

- ✓ Make learners perform and explain OPERATION SHEET 1.3 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.
- ✓ Let learners carry out activities of SAMPLE SELF CHECK 1.3
- ✓ Make learners read INFORMATION SHEET 1.3 and perform OPERATION SHEET 1.1 and ask them to send video as evidence through Google Classroom or any other relevant social media platform.
- ✓ Let the learners solve SAMPLE SELF CHECK 1.3 and submit answers through Google Classroom or any other relevant social media.

E. Resources:

- ✓ Competency-Based Learning Materials
- ✓ https://www.youtube.com/watch?v=F-_O2x6GFQA (shows how to make wire joints)

Chapter 2: Performing lighting and power circuit wiring

A. Competency/Competencies:

- ✓ Interpret the drawing and perform wiring to provide illumination

B. Learning objectives/Topic:

Learning objectives	Topic
2.1.1 Introduce house wiring 2.1.2 State electrical sign and symbols 2.1.3 List types of house wiring and its application 2.1.4 List types of installation rules 2.1.5 State advantages and disadvantages of different types of wiring 2.1.6 Differentiate between surface and concealed wiring 2.1.7 List types of Distribution board(DB) 2.1.8 List types of protective switch gears 2.1.9 List types of sub- circuit 2.1.10 List types of switches 2.1.11 List types of sockets 2.1.12 List types of holders 2.1.13 List types of luminaries/ lamps 2.1.14 State color coding of wire 2.1.15 State size of wires and rating 2.1.16 List different size of casing capping bit and its accessories 2.1.17 *Use wire drawing skills* 2.1.18 *Use spirit level* 2.1.19 *Use drilling machine* 2.1.20 *Interpret circuit drawing* 2.1.21 *Ensure safe handling of instruments.* 2.1.22 *Ensure to follow OHS rules and regulations* 2.1.23 *Ensure appropriate use of PPE* 2.1.24 *Ensure proper disposal of waste* 2.1.25 Perform PVC casing capping wiring for 2 lighting loads	2.1 Performing PVC casing capping wiring for 2 lighting loads **Overview:** The topic is about types of house wiring and its application. It also explains the general installation rules. It can enable the learners to perform wiring to provide illumination to any kind of dwellings.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 2.1
- ✓ Provide handouts
- ✓ Demonstrate on OPERATION SHEET 2.1
- ✓ Provide guided practice on OPERATION SHEET 2.1
- ✓ Make learners perform OPERATION SHEET 2.1
- ✓ Instruct learners to read INFORMATION SHEET 2.1
- ✓ Provide handouts, self-made tutorial video clip, and PPT through Google Classroom.
- ✓ Let the learners submit their responses through Google Classroom or any other relevant social media.

D. **Assessment:**

- ✓ Make learners perform and explain OPERATION SHEET 2.1 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.
- ✓ Assess learner's knowledge about washing electric heater by asking questions
- ✓ Let learners carry out activities of SAMPLE SELF CHECK 2.1
- ✓ Let learners solve SAMPLE SELF CHECK 2.1 and submit answers through Google Classroom or any other relevant social media.
- ✓ Give additional relevant questions from CBLM and other resources-text/ Google/ YouTube and let learners submit answer through Google Classroom or any other relevant social media

E. **Resources:**

- ✓ Handouts
- ✓ Competency-Based Learning Materials

A. Competency/Competencies:

- ✓ Interpret the drawing and perform PVC conduit wiring to provide illumination

B. Learning objectives/Topic:

Learning objectives	**Topic**
2.2.1 Introduce to PVC conduit wiring 2.2.2 List lighting and power loads 2.2.3 List advantages and disadvantages of PVC Conduit wiring 2.2.4 State the application of PVC conduit wiring 2.2.5 List types of PVC conduit fitting. 2.2.6 List the importance of pre-installation test 2.2.7 ***Interpret drawings*** 2.2.8 ***Use drilling machine***	2.2 Performing PVC conduit wiring for 2 lightings and 1 power load **Overview:** The topic is about different types of load and conduit wiring. It can enable the learners to perform PVC conduit wiring to provide illumination to any kind of dwellings.

2.2.9 ***Use IR tester*** 2.2.10 ***Use spirit level*** 2.2.11 ***Wire drawings skills*** 2.2.12 *Ensure to follow OHS rules and regulations* 2.2.13 *Ensure appropriate use of PPE* 2.2.14 *Ensure proper disposal of waste* 2.2.15 *Ensure safe handling of instrument* 2.2.16 Performing PVC conduit wiring for 2 lighting and 1 power load	

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 2.2
- ✓ Provide handouts
- ✓ Demonstrate on OPERATION SHEET 2.2
- ✓ Provide guided practice on OPERATION SHEET 2.2
- ✓ Make learners perform OPERATION SHEET 2.2
- ✓ Instruct learners to read INFORMATION SHEET 2.2
- ✓ Provide handouts, self-made tutorial video clip, and PPT through Google Classroom.
- ✓ Let the learners submit their responses through Google Classroom or any other relevant social media.

D. **Assessment:**

- ✓ Make learners perform and explain OPERATION SHEET 2.2 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.
- ✓ Assess learner's knowledge about washing electric heater by asking questions
- ✓ Let learners carry out activities of SAMPLE SELF CHECK 2.2
- ✓ Let learners solve SAMPLE SELF CHECK 2.2 and submit answers through Google Classroom or any other relevant social media.
- ✓ Give additional relevant questions from CBLM and other resources-text/ Google/ YouTube and let learners submit answer through Google Classroom or any other relevant social media

E. **Resources:**

- ✓ Handouts
- ✓ Competency-Based Learning Materials

A. Competency/Competencies:

- ✓ Interpret the drawing and perform MS conduit wiring to provide illumination

B. Learning objectives/Topic:

Learning objectives		Topic
2.3.1	Explain the lighting and power load	2.3 Performing MS conduit wiring for 3 lighting and 1 power load **Overview:** The topic is about MS conduit wiring, its application and types of MS conduit fittings. It can enable the learners to performs MS conduit wiring to provide illumination to any kind of dwellings.
2.3.2	Introduce MS conduit wiring.	
2.3.3	List the advantages and disadvantages of MS conduit wiring	
2.3.4	State the application of MS conduit wiring.	
2.3.5	List the types of MS conduit fitting	
2.3.6	*Interpret drawings*	
2.3.7	*Use drilling machine*	
2.3.8	*Use IR tester*	
2.3.9	*Use spirit level*	
2.3.10	*Wire drawings skills*	
2.3.11	*Ensure safe handling of materials.*	
2.3.12	*Ensure to follow OHS rules and regulations*	
2.3.13	*Ensure appropriate use of PPE*	
2.3.14	*Ensure proper disposal of waste*	
2.3.15	Perform MS conduit wiring foe 3 lighting load and 1 power load	

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 2.3
- ✓ Provide handouts
- ✓ Demonstrate on OPERATION SHEET 2.3
- ✓ Provide guided practice on OPERATION SHEET 2.3
- ✓ Make learners perform OPERATION SHEET 2.3
- ✓ Instruct learners to read INFORMATION SHEET 2.3
- ✓ Provide handouts, self-made tutorial video clip, and PPT through Google Classroom.
- ✓ Let the learners submit their responses through Google Classroom or any other relevant social media.

D. **Assessment:**

- ✓ Make learners perform and explain OPERATION SHEET 2.3 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.
- ✓ Assess learner's knowledge about washing electric heater by asking questions
- ✓ Let learners carry out activities of SAMPLE SELF CHECK 2.3
- ✓ Let learners solve SAMPLE SELF CHECK 2.3 and submit answers through Google Classroom or any other relevant social media.

- ✓ Give additional relevant questions from CBLM and other resources-text/ Google/ YouTube and let learners submit answer through Google Classroom or any other relevant social media

E. **Resources:**
- ✓ Handouts
- ✓ Competency-Based Learning Materials

Chapter 1: Repairing home appliances

A. Competency/Competencies:

- ✓ Use the component of boilers(thermostat) in other appliances

B. Learning objectives/Topic:

Learning objectives	Topic
1.1.1 List the types of the water boiler. 1.1.2 Explain the construction and working principle of the water boiler. 1.1.3 Identify and state the function of each component of the water boiler. 1.1.4 Interpret circuit diagram of the water boiler. 1.1.5 Identify the defect of the water boiler. 1.1.6 *Use multimeter.* 1.1.7 *Ensure to store the removed parts safely.* 1.1.8 *Ensure to disconnect the wires properly.* 1.1.9 *Ensure secured connections of electrical wires.* 1.1.10 Repair water boiler	1.1 Repairing water boiler: **Overview:** The topic is about the types, components and the working principal of water boiler. It can enable the learners to identify different components, troubleshoot and repair water boiler.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 1.1
- ✓ Provide handouts to learners
- ✓ Demonstrates on OPERATION SHEET 1.1
- ✓ Provide guided practice on OPERATION SHEET 1.1
- ✓ Make learners perform OPERATION SHEET 1.1 i
- ✓ Instruct learners to read INFORMATION SHEET 1.1 through Google Classroom
- ✓ Provide handouts, self-made tutorial video clip, and PPT through Google Classroom.
- ✓ Instruct learners to make PPT on components of the water boiler.
- ✓ Let the learners submit their responses through Google Classroom or any other relevant social media.

D. **Assessment:**

- ✓ Make learners perform and explain OPERATION SHEET 1.1 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.
- ✓ Assess learner's knowledge about water boiler by asking questions
- ✓ Let learners carry out activities of SAMPLE SELF CHECK 1.1
- ✓ Make learners read INFORMATION SHEET 1.1and ask them to send PPT on explaining components of the boiler through Google Classroom or any other relevant social media platform, used rubrics to assess their understanding.
- ✓ Let the learners solve SAMPLE SELF CHECK 1.1 and submit answers through Google Classroom or any other relevant social media.

E. **Resources:**

- ✓ Competency-Based Learning Materials
- ✓ Handouts

A. Competency/Competencies:

- ✓ Use the component of the geyser (coil/thermostat) in other appliances

B. Learning objectives/Topic:

Learning objectives	Topic
1.2.1 List the types of the geyser. 1.2.2 Explain the construction and working principle of geysers. 1.2.3 Identify and state the function of each component of a geyser. 1.2.4 Interpret circuit diagram of a geyser. 1.2.5 Identify the defect of a geyser. *1.2.6 Use multimeter.* *1.2.7 Ensure to store the removed parts safely.* *1.2.8 Ensure to disconnect the wires properly.* *1.2.9 Ensure secured connections of electrical wires.* *1.2.10* Repair geyser	1.2 Repairing geyser **Overview:** The topic is about the types, components and the working principal of geyser. It can enable the learners to identify different components, troubleshoot and geyser

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 1.2
- ✓ Provide handouts to learners
- ✓ Demonstrate on OPERATION SHEET 1.2
- ✓ Provide guided practice on OPERATION SHEET 1.2
- ✓ Make learners perform OPERATION SHEET 1.2 individually
- ✓ Let the learners discuss in the group and do presentations on defects/solutions of the geyser and share the information among their peers.
- ✓ Instruct learners to read INFORMATION SHEET 1.2
- ✓ Provide handouts, self-made tutorial video clip, and PPT through Google Classroom.
- ✓ Instruct learners to make PPT on defects and its solution of geyser
- ✓ Let the learners submit their responses through Google Classroom or any other relevant social media.

D. **Assessment:**

- ✓ Make learners perform and explain OPERATION SHEET 1.2 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.
- ✓ Assess learner's knowledge about geyser by asking questions
- ✓ Let learners carry out activities of SAMPLE SELF CHECK 1.2

- ✓ Make learners read INFORMATION SHEET 1.2 and ask them to make PPT on defects and their solutions and send through Google Classroom or any other relevant social media.
- ✓ Let learners solve SAMPLE SELF CHECK 1.2 and submit answers through Google Classroom or any other relevant social media.
- ✓ Give additional relevant questions from CBLM and other resources-text/ Google/ YouTube and let learners submit answers through Google Classroom or any other relevant social media

E. **Resources:**

- ✓ Handout
- ✓ Competency-Based Learning Materials

A. Competency/Competencies:

- ✓ Use the components of the washing machine (timer or motor) in other equipment/lighting

B. Learning objectives/Topic:

Learning objectives	**Topic**
1.3.1 List the types of the washing machine. 1.3.2 Explain the construction and working principle of washing machines. 1.3.3 Identify and state the function of each component of the washing machine. 1.3.4 Interpret circuit diagram of a washing machine. 1.3.5 Identify the defect of a washing machine. *1.3.6 Use multimeter.* *1.3.7 Ensure to store the removed parts safely.* *1.3.8 Ensure to disconnect the wires properly.* *1.3.9 Ensure secured connections of electrical wires.* *1.3.10* Repair washing machine	1.3 Repairing washing machine **Overview:** The topic is about the types, components and the working principal of washing machine. It can enable the learners to identify different components, troubleshoot and repair washing machine.

C. **Learning Experiences:**

- ✓ Make learners read INFORMATION SHEET 1.3
- ✓ Provide handouts to learners
- ✓ Demonstrates on OPERATION SHEET 1.3
- ✓ Provide guided practice on OPERATION SHEET 1.3
- ✓ Make learners perform OPERATION SHEET 1.3 individually
- ✓ Let the learners discuss in the group and do a presentation on defects of washing machine
- ✓ Instruct learners to read INFORMATION SHEET 1.3

- ✓ Provide handouts, self-made tutorial video clip, and PPT through Google Classroom.
- ✓ Instruct learners to make PPT on defects and its solution of the washing machine.
- ✓ Let the learners submit their responses through Google Classroom or any other relevant social media.

D. **Assessment:**

- ✓ Make learners perform and explain OPERATION SHEET 1.3 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.
- ✓ Assess learner's knowledge about washing machine by asking questions
- ✓ Let learners carry out activities of SAMPLE SELF CHECK 1.3
- ✓ Make learners read INFORMATION SHEET 1.3 and ask them to make PPT on defects and its solution of washing machine and through Google Classroom or any other relevant social media.
- ✓ Let learners solve SAMPLE SELF CHECK 1.3 and submit answers through Google Classroom or any other relevant social media.

E. **Resources:**

- ✓ Competency-Based Learning Materials
- ✓ Handouts

A. Competency/Competencies:

- ✓ Use the components of electric iron (thermostat) in other appliances

B. Learning objectives/Topic:

Learning objectives	**Topic**
1.4.1 List types of the electric iron. 1.4.2 Explain the construction and working principle of an electric iron. 1.4.3 Identify and state the function of each component of the electric iron. 1.4.4 Interpret circuit diagram of an electric iron. 1.4.5 Identify the defect of an electric iron. *1.4.6 Use multimeter.* *1.4.7 Ensure to store the removed parts safely.* *1.4.8 Ensure to disconnect the wires properly.* 1.4.9 *Ensure secured connections of electrical wires.* 1.4.10 Repair electric iron	1.4 Repairing electric iron **Overview:** The topic is about the types, components and the working principal of electric iron. It can enable the learners to identify different components, troubleshoot and repair electric iron.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 1.4
- ✓ Provide handouts to learners

- ✓ Provide the web link https://fixitclub.com/small-appliances-repairs/electric-iron-repair/ with learners which explains the procedure to repair electric heater
- ✓ Demonstrates on OPERATION SHEET 1.4
- ✓ Provide guided practice on OPERATION SHEET 1.4
- ✓ Make learners perform OPERATION SHEET 1.4 individually
- ✓ Instruct learners to read INFORMATION SHEET 1.4
- ✓ Provide a web link https://fixitclub.com/small-appliances-repairs/electric-iron-repair/ with learners which explains the procedure to repair electric heater.
- ✓ Provide handouts, self-made tutorial video clip, and PPT through Google Classroom.
- ✓ Let the learners submit their responses through Google Classroom or any other relevant social media.

D. **Assessment:**

- ✓ Make learners perform and explain OPERATION SHEET 1.4 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding Provide necessary feedback.
- ✓ Assess learner's knowledge about washing electric heater by asking questions
- ✓ Let learners carry out activities of SAMPLE SELF CHECK 1.4
- ✓ Let learners solve SAMPLE SELF CHECK 1.4 and submit answers through Google Classroom or any other relevant social media.
- ✓ Give additional relevant questions from CBLM and other resources-text/ Google/ YouTube and let learners submit answer through Google Classroom or any other relevant social media

E. Resources:

- ✓ Competency-Based Learning Materials
- ✓ Handouts
- ✓ https://fixitclub.com/small-appliances-repairs/electric-iron-repair/ (procedure to repair electric iron)

A. Competency/Competencies:

- ✓ Use the component of curry cooker(thermostat) in other appliances

B. Learning objectives/Topic:

Learning objectives	**Topic**
1.5.1 List the types of curry cookers. 1.5.2 Explain the construction and working principle of curry cookers. 1.5.3 Interpret circuit diagram of curry cooker. *1.5.4* Identify the defect of the curry cooker. *1.5.5 Use multimeter.* *1.5.6 Ensure to store the removed parts safely.* *1.5.7 Ensure to disconnect the wires properly.*	1.5 Repairing curry cooker **Overview:** The topic is about the types, components and the working principal of curry cooker. It can enable the learners to identify different components, troubleshoot and repair curry cooker.

1.5.8 *Ensure secured connections of electrical wires* 1.5.9 Repair curry cooker	

C. **Learning Experiences:**

- ✓ Make learners read INFORMATION SHEET 1.5
- ✓ Provide handouts to learners
- ✓ Demonstrate on OPERATION SHEET 1.5
- ✓ Provide guided practice on OPERATION SHEET 1.5
- ✓ Make learners perform OPERATION SHEET 1.5
- ✓ Instruct learners to read INFORMATION SHEET 1.5
- ✓ Provide a web link https://www.youtube.com/watch?v=_f2umEYIi5w with learners which explains how to repair curry cooker
- ✓ Provide handouts, self-made tutorial video clip, and PPT through Google Classroom.
- ✓ Instruct learners to make a video explaining components of the curry cooker
- ✓ Let the learners submit their responses through Google Classroom or any other relevant social media.

D. **Assessment:**

- ✓ Make learners perform and explain OPERATION SHEET 1.5 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.
- ✓ Assess learner's knowledge about washing electric heater by asking questions
- ✓ Conduct class test to assess learner understanding
- ✓ Let learners carry out activities of SAMPLE SELF CHECK 1.5
- ✓ Make learners read INFORMATION SHEET 1.5 and ask them to send video as evidence through Google Classroom or any other relevant social media.
- ✓ Let learners solve SAMPLE SELF CHECK 1.5 and submit answers through Google Classroom or any other relevant social media.
- ✓ Give additional relevant questions from CBLM and other resources-text/ Google/ YouTube and let learners submit answer through Google Classroom or any other relevant social media

E. Resources:

- ✓ Competency-Based Learning Materials
- ✓ Handout
- ✓ https://www.youtube.com/watch?v=_f2umEYIi5w (Repairing of curry cooker)

A. Learning objectives/Topic:

Learning objectives	**Topic**
1.6.1 List the types of the rice cooker. 1.6.2 Explain the construction and working principle of the rice cooker. 1.6.3 Identify and state the function of each component of the rice cooker. 1.6.4 Interpret circuit diagram of a rice cooker.	1.6 Repairing rice cooker **Overview:** The topic is about the types, components and the working principal of rice cooker. It can enable the

1.6.5 Identify the defect of a rice cooker. *1.6.6 Use multimeter.* *1.6.7 Ensure to store the removed parts safely.* *1.6.8 Ensure to disconnect the wires properly.* 1.6.9 *Ensure secured connections of electrical wires.* 1.6.10 Repair rice cooker	learners to identify different components, troubleshoot and repair rice cooker.

B. Competency/Competencies:

- ✓ Use the component of the rice cooker (thermostat) in other appliances

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 1.6
- ✓ Provide handouts to learners
- ✓ Demonstrate on OPERATION SHEET 1.6
- ✓ Provide guided practice on OPERATION SHEET 1.6
- ✓ Make learners perform OPERATION SHEET 1.6
- ✓ Instruct learners to read INFORMATION SHEET 1.6
- ✓ Provide a web link https://www.youtube.com/watch?v=n6MSrrPfFo4 with learners which explains how to repair rice cooker
- ✓ Provide handouts, self-made tutorial video clip, and PPT through Google Classroom.
- ✓ Instruct learners to make a video explaining the components of the rice cooker.
- ✓ Let the learners submit their responses through Google Classroom or any other relevant social media.

D. **Assessment:**

- ✓ Make learners perform and explain OPERATION SHEET 1.6 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.
- ✓ Assess learner's knowledge about washing electric heater by asking questions
- ✓ Let learners carry out activities of SAMPLE SELF CHECK 1.6
- ✓ Make learners read INFORMATION SHEET 1.6 and ask them to send video as evidence through Google Classroom or any other relevant social media.
- ✓ Let learners solve SAMPLE SELF CHECK 1.6 and submit answers through Google Classroom or any other relevant social media.

E. Resources:

- ✓ Competency-Based Learning Materials
- ✓ Handouts
- ✓ https://www.youtube.com/watch?v=n6MSrrPfFo4 (Explanation on repairing of rice cooker)

A. Competency/Competencies:

- ✓ Use the component of ceiling fan (capacitor) in other appliances

B. Learning objectives/Topic:

Learning objectives	Topic
1.7.1 Explain the construction and working principle of a ceiling fan. 1.7.2 Identify and state the function of each component of a ceiling fan. 1.7.3 Interpret circuit diagram of a ceiling fan. 1.7.4 Identify the defect of a ceiling fan. *1.7.5 Use multimeter.* *1.7.6 Ensure to store the removed parts safely.* *1.7.7 Ensure to disconnect the wires properly.* 1.7.8 *Ensure secured connections of electrical wires.* 1.7.9 *Repair ceiling fan*	1.7 Repairing ceiling fan **Overview:** The topic is about the components and the working principal of ceiling fan. It can enable the learners to identify different components, troubleshoot and repair ceiling fan.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 1.7
- ✓ Provide handouts to learners
- ✓ Demonstrate on OPERATION SHEET 1.7
- ✓ Provide guided practice on OPERATION SHEET 1.7
- ✓ Make learners perform OPERATION SHEET 1.7 individually
- ✓ Let learners discuss in the group and do the presentation on components of the ceiling fan.
- ✓ Instruct learners to read INFORMATION SHEET 1.7
- ✓ Provide a web link https://www.youtube.com/watch?v=n6MSrrPfFo4 with learners which explains how to repair rice cooker
- ✓ Provide handouts, self-made tutorial video clip, and PPT through Google Classroom.
- ✓ Instruct learners to make handouts on components of the ceiling fan.
- ✓ Let the learners submit their responses through Google Classroom or any other relevant social media.

D. **Assessment:**

- ✓ Make learners perform and explain OPERATION SHEET 1.7 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.
- ✓ Assess learner's knowledge about washing electric heater by asking questions
- ✓ Conduct class test
- ✓ Let learners carry out activities of SAMPLE SELF CHECK 1.7
- ✓ Make learners read INFORMATION SHEET 1.7 and ask them to send a handout through Google Classroom or any other social media.

- ✓ Let learners solve SAMPLE SELF CHECK 1.7 and submit answers through Google Classroom or any other relevant social media.
- ✓ Give additional relevant questions from CBLM and other resources-text/ Google/ YouTube and let learners submit answer through Google Classroom or any other relevant social media

E. **Resources:**

- ✓ Handouts
- ✓ Textbook(CBLM for class XI)

A. Competency/Competencies:

- ✓ Use the components of the electric heater (coil) in other appliances

B. Learning objectives/Topic:

Learning objectives	**Topic**
1.8.1 List the types of the electric heater. 1.8.2 Explain the construction and work principle of an electric heater. 1.8.3 Identify and state the function of each component of an electric heater. 1.8.4 Interpret circuit diagram of an electric heater. *1.8.5 Use multimeter.* *1.8.6 Ensure to store the removed parts safely.* *1.8.7 Ensure to disconnect the wires properly.* 1.8.8 *Ensure secured connections of electrical wires.* 1.8.9 *Repair electric heater*	1.8 Repair electric heater **Overview:** The topic is about the types, components and the working principal of electric heater. It can enable the learners to identify different components, troubleshoot and repair electric heater.

C. **Learning Experiences:**

- ✓ Make learners read INFORMATION SHEET 1.8
- ✓ Provide handouts to learners
- ✓ Demonstrate on OPERATION SHEET 1.8
- ✓ Provide guided practice on OPERATION SHEET 1.8
- ✓ Make learners perform OPERATION SHEET 1.8 individually
- ✓ Instruct learners to read INFORMATION SHEET 1.8
- ✓ Provide handouts, self-made tutorial video clip, and PPT through Google Classroom.
- ✓ Let the learners submit their responses through Google Classroom or any other relevant social media.

D. **Assessment:**

- ✓ Make learners perform and explain OPERATION SHEET 1.8 and use rubric (Available in framework 2022) to assess the learner's conceptual understanding. Provide necessary feedback.
- ✓ Assess learners response to SAMPLE SELF CHECK 1.8
- ✓ Assess learner's knowledge about washing electric heater by asking questions
- ✓ Assess learner response of SAMPLE SELF CHECK 1.8 and submit answer through Google Classroom or any other relevant social media.
- ✓ Give additional relevant questions from CBLM and other resources-text/ Google/ YouTube and let learners submit answer through Google Classroom or any other relevant social media

E. Resources:

- ✓ Handout
- ✓ Competency-Based Learning

Class XII

Module IV: Carrying out domestic wiring

Chapter 2: Performing lighting and power circuit wiring

A. Competency/Competencies:

- ✓ Perform laying of concealed conduit on wall and ceiling.

B. Learning objectives/Topic:

Learning objectives	Topic
2.4.1 List types of concealed wiring. 2.4.2 State the methods of concealed wiring. 2.4.3 State advantages and disadvantages of concealed wiring 2.4.4 State the application of concealed wiring 2.4.5 ***Use drilling machine*** 2.4.6 ***Use spirit level*** 2.4.7 *Ensure appropriate use of PPE* 2.4.8 *Ensure to follow OHS rules and regulations* 2.4.9 *Ensure proper disposal of waste* 2.4.10 Lay concealed conduit	2.4 Laying concealed conduit **Overview:** It is about laying of conceal conduit and it enables the learners to predict the location of point on the wall and floor and estimate the cost of wiring.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 2.4.
- ✓ Provide handouts to learners.
- ✓ Provide a web link to make the learner's clear about how to perform laying of concealed conduit Concealed Wiring vs Open Wiring - YouTube
- ✓ Make learners perform OPERATION SHEET 2.4.
- ✓ Pair up the students and let them explore the information about laying of concealed conduit.
- ✓ Provide handouts, self-made tutorial video clips, and PPT through Google Classroom or any other relevant social media.
- ✓ Let the learners discuss in the group and submit their response through Google Classroom or any other relevant social media.

D. **Assessment:**

- ✓ Make learners read INFORMATION SHEET 2.4 and perform OPERATION SHEET 2.4 and assess them using the checklist/performance guide. Provide necessary intervention.
- ✓ Assess learners knowledge by asking questions.
- ✓ Conduct class test to assess their understanding.
- ✓ Let the learners carry out activities of the SAMPLE SELF CHECK 2.4 and assess their response.
- ✓ Conduct viva to assess their understanding of laying of concealed conduit wiring.

E. **Resources:**

- ✓ CBLM for class XII.
- ✓ Handouts.
- ✓ Concealed Wiring vs Open Wiring - YouTube(shows how to layout conceal conduit).

A. Competency/Competencies:

- ✓ Perform staircase wiring to control lamp with ease from two locations.

B. Learning objectives/Topic:

Learning objectives	Topic
2.5.1 State the application of stair case wiring ***2.5.2 Use IR tester*** 2.5.3 ***Use spirit level*** 2.5.4 ***Use drilling machine*** 2.5.5 ***Interpret drawings*** 2.5.6 *Ensure appropriate use of PPE* *2.5.7 Ensure to follow OHS rules and regulations* *2.5.8 Ensure proper disposal of waste* **2.5.9** Perform stair case wiring	2.5 Performing stair case wiring **Overview:** It is about controlling of one lamp (bulb) from different location and it enables the learners complete the work faster.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 2.5.
- ✓ Provide handouts to learners.
- ✓ Provide a web link to make the learner's clear about how to perform staircase wiring https://www.youtube.com/watch?v=Ipm5uycOncs.
- ✓ Make learners perform OPERATION SHEET 2.5.
- ✓ Pair up the students and let them explore the information about staircase wiring.
- ✓ Provide handouts, self-made tutorial video clips, and PPT through Google Classroom or any other relevant social media.
- ✓ Let the learners discuss in the group and submit their response through Google Classroom or any other relevant social media.

D. Assessment:

- ✓ Make learners read INFORMATION SHEET 2.5 and perform OPERATION SHEET 2.5 and assess them using the checklist/performance guide. Provide necessary intervention.
- ✓ Assess learners' knowledge by asking questions.
- ✓ Conduct class test to assess their understanding.
- ✓ Let the learners carry out activities of the SAMPLE SELF CHECK 2.5 and assess their response.
- ✓ Conduct viva to assess their understanding of staircase wiring.

E. Resources:

- ✓ CBLM for class XII.
- ✓ Handouts.
- ✓ https://www.youtube.com/watch?v=Ipm5uycOncs (shows how to perform staircase wiring).

A. Competency/Competencies:

- ✓ Perform hostel wiring to obtain independent controls of lamps and for efficient use of electricity.

B. Learning objectives/Topic:

Learning objectives	Topic
2.6.1 State the application of hostel wiring *2.6.2* ***Use IR tester*** *2.6.3* ***Use spirit level*** *2.6.4* ***Use drilling machine*** *2.6.5* ***Interpret drawings*** 2.6.6 *Ensure appropriate use of PPE* *2.6.7 Ensure to follow OHS rules and regulations* 2.6.8 *Ensure proper disposal of waste* 2.6.9 Perform hostel wiring	2.6 Performing hostel wiring **Overview:** It is about hostel wiring and it enables the learners to control lighting system of whole building through one master switch.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 2.6.
- ✓ Provide handouts to learners.
- ✓ Make learners perform OPERATION SHEET 2.6.
- ✓ Let the learners discuss in the group and submit their response through Google Classroom or any other relevant social media.
- ✓ Provide the learners with the single line diagram of a house and let them develop a wiring diagram and do estimate and costing.
- ✓ Provide a web link to make the learner's clear about how to perform hostel wiring hostel wiring connection diagram - YouTube (Explain about hostel wiring)

D. **Assessment:**

- ✓ Make learners read INFORMATION SHEET 2.6 and perform OPERATION SHEET 2.6 and assess them using a checklist/performance guide. Provide necessary intervention.
- ✓ Assess learners' knowledge by asking questions.
- ✓ Conduct class test to assess their understanding.
- ✓ Let the learners carry out activities of the SAMPLE SELF CHECK 2.6 and assess their response.
- ✓ Let the learners do the presentation and assess as per the rubric development.

- ✓ Conduct a test to see the ability of the student to develop a layout diagram and wiring diagram.

E. **Resources**:

- ✓ CBLM for class XII.
- ✓ Handouts.
- ✓ hostel wiring connection diagram - YouTube (Explain about hostel wiring)

A. Competency/Competencies:

- ✓ Perform call bell wiring to alert the occupant.

B. Learning objectives/Topic:

Learning objectives	Topic
2.7.1 State the application call bell wiring 2.7.2 List types of call bell 2.7.3 ***Use IR tester*** 2.7.4 ***Use spirit level*** 2.7.5 ***Use drilling machine*** 2.7.6 ***Interpret drawings*** 2.7.7 *Ensure appropriate use of PPE* 2.7.8 *Ensure to follow OHS rules and regulations* *2.7.9 Ensure proper disposal of waste* ***2.7.10*** Perform call bell wiring	2.7 Performing call bell wiring **Overview:** It is about call bell and it enables the learners to alert the occupant or assistant.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 2.7.
- ✓ Provide handouts to learners.
- ✓ Provide web link https://www.youtube.com/watch?v=O_OfswJjqgY which explains the ways of performing call bell wiring.
- ✓ Make learners perform OPERATION SHEET 2.7.
- ✓ Using previous knowledge of interpreting the layout diagram, let a student explain the wiring diagram to the class.
- ✓ Let the learners discuss in the group and submit their response through Google Classroom or any other relevant social media.
- ✓ Provide the learners with the single line diagram of a house and let them develop a wiring diagram and do estimate and costing.

D. Assessment:

- ✓ Make learners read INFORMATION SHEET 2.7 and perform OPERATION SHEET 2.7 and assess them using a checklist/performance guide. Provide necessary intervention.
- ✓ Assess learners' knowledge by asking questions.
- ✓ Conduct class test to assess their understanding.

- ✓ Let the learners carry out activities of the SAMPLE SELF CHECK 2.7 and assess their response.
- ✓ Let the learners do the presentation and assess as per the rubric development.
- ✓ Conduct a question-answer session with the learners to assess the learners conceptual understanding of call-bell wiring.

E. **Resources:**

- ✓ CBLM for class XII.
- ✓ Handouts.
- ✓ https://www.youtube.com/watch?v=O_OfswJjqgY (shows the connection of call bell wiring to be used at home).

A. Competency/Competencies:

- ✓ Perform go-down wiring for economical use of electricity.

B. Learning objectives/Topic:

Learning objectives	Topic
2.8.1 State the application of go-down wiring 2.8.2 ***Use IR tester*** 2.8.3 ***Use spirit level*** 2.8.4 ***Use drilling machine*** 2.8.5 ***Interpret drawings*** 2.8.6 *Ensure appropriate use of PPE* 2.8.7 *Ensure to follow OHS rules and regulations* 2.8.8 *Ensure proper disposal of waste* 2.8.9 Perform go- down wiring	2.8 Perform go- down wiring ✓ **Overview:** It is about go-down wiring and it enables the learners to control the light from different locations.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 2.8.
- ✓ Provide handouts to learners.
- ✓ Provides weblink godown wiring connection diagram video - YouTube to make the learners understand about go-down wiring.
- ✓ Make learners perform OPERATION SHEET 2.8.
- ✓ Provide the learners with the single line diagram and let them develop wiring diagram and do the estimate and costing and submit it in google classroom.

D. **Assessment:**

- ✓ Make learners read INFORMATION SHEET 2.8 and perform OPERATION SHEET 2.8 and assess them using the checklist/performance guide. Provide necessary intervention.
- ✓ Assess learners' knowledge by asking questions.
- ✓ Conduct class test to assess their understanding.
- ✓ Let the learners carry out activities of the SAMPLE SELF CHECK 2.8 and assess their response.

- ✓ Let the learners do the presentation and assess as per the rubric development.

E. **Resources:**

- ✓ CBLM for class XII.
- ✓ Handouts.
- ✓ godown wiring connection diagram video - YouTube (Explains about go-down and its procedures).

A. Competency/Competencies:

- ✓ Perform corridor wiring for economical use of electricity.

B. Learning objectives/Topic:

Learning objectives	Topic
2.9.1 State the application of corridor wiring ***2.9.2 Use spirit level*** ***2.9.3 Use drilling machine*** ***2.9.4 Interpret drawings*** ***2.9.5 Use of IR tester*** 2.9.6 *Ensure appropriate use of PPE* *2.9.7 Ensure to follow OHS rules and regulations* *2.9.8 Ensure proper disposal of waste* 2.9.9 Perform corridor wiring	2.9 Performing corridor wiring **Overview:** It is about corridor wiring and it enables the learners to perform corridor wiring for economical use of electricity.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 2.9.
- ✓ Provide handouts to learners
- ✓ Provides weblink Corridor wiring connection diagram - YouTube to make the learners understand about go-down wiring.
- ✓ Make learners perform OPERATION SHEET 2.9.
- ✓ Provide the learners with the single line diagram and let them develop wiring diagram and do the estimate and costing and submit it in google classroom.

D. Assessment:

- ✓ Make learners read INFORMATION SHEET 2.9 and perform OPERATION SHEET 2.9 and assess them using the checklist/performance guide. Provide necessary intervention.
- ✓ Assess learners' knowledge by asking questions.
- ✓ Conduct class test to assess their understanding.
- ✓ Let the learners carry out activities of the SAMPLE SELF CHECK 2.9 and assess their response.
- ✓ Let the learners do the presentation and assess as per the rubric development.

E. **Resources:**

- ✓ CBLM for class XII.
- ✓ Handouts.
- ✓ Corridor wiring connection diagram - YouTube (Explains about corridor and its procedures).

Chapter 3: Performing installation test

A. Competency/Competencies:

- ✓ Perform IR test to avoid short circuit.
- ✓ Use different equipment other than megger to conduct IR tests such as multi-meter and test lamp.

B. Learning objectives/Topic:

Learning objectives	Topic
3.1.1 State the purpose of IR test 3.1.2 State the standard of IR test 3.1.3 ***Use IR tester*** 3.1.4 *Ensure appropriate use of PPE* 3.1.5 *Ensure to follow OHS rules and regulations* 3.1.6 *Ensure proper disposal of waste* 3.1.7 *Ensure correct selection of test voltage* 3.1.8 Perform IR test	3.1 Performing Insulation Resistance (IR) test **Overview:** It is about insulation resistance tester and it enables the learners to determine the insulation of conductor and check the insulation of conductor.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 3.1.
- ✓ Provide handouts to learners.
- ✓ Provide web link Insulation Resistance Test (Includes Line and Neutral Together to Earth and Between Live Conductors) - YouTube which explains about IR test and its procedures.
- ✓ Make learners perform OPERATION SHEET 3.1.
- ✓ Demonstrate the learner on the steps to conduct IR test.
- ✓ Provide handouts, self-made tutorial video clips, and PPT through Google Classroom or any other relevant social media.
- ✓ Let the learners discuss in the group and submit their response through Google Classroom or any other relevant social media.

D. **Assessment:**

- ✓ Make learners read INFORMATION SHEET 3.1 and perform OPERATION SHEET 3.1 and assess them using the checklist/performance guide. Provide necessary intervention.
- ✓ Assess learners' knowledge by asking questions.
- ✓ Conduct class test to assess their understanding.
- ✓ Let the learners carry out activities of the SAMPLE SELF CHECK 3.1.
- ✓ Conduct a question-answer session with the learners to assess the learners conceptual understanding of the IR test.

E. **Resources:**

- ✓ CBLM for classes X and XII.
- ✓ Handouts.

- ✓ Insulation Resistance Test (Includes Line and Neutral Together to Earth and Between Live Conductors) - YouTube (Explains about IR test and its procedures).

A. Competency/Competencies:

- ✓ Perform continuity test to avoid short circuit.
- ✓ Use different equipment other than megger to conduct continuity tests such as multi-meter and test lamp.

B. Learning objectives/Topic:

Learning objectives	Topic
3.2.1 State the purpose of continuity test 3.2.2 State the function of IR tester 3.2.3 ***Use IR tester*** 3.2.4 *Ensure appropriate use of PPE* 3.2.5 *Ensure to follow OHS rules and regulations* 3.2.6 *Ensure proper disposal of waste* 3.2.7 *Ensure correct selection of test voltage* 3.2.8 Perform continuity test	3.2 Performing continuity test **Overview:** It is about performing continuity test and it enables the learners to confirm conductor is good enough to use or to check the quality of conductor.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 3.2.
- ✓ Provide handouts to learners.
- ✓ Provide web link How to do a Continuity Test With a Multimeter | Repair and Replace - YouTube, MFT1741 Continuity Measurement Test with auto start and audible notice when test is completed - YouTube which explains about continuity test and its procedures.
- ✓ Make learners perform OPERATION SHEET 3.2.
- ✓ Demonstrate the learner on the steps to conduct continuity test.
- ✓ Provide handouts, self-made tutorial video clips, and PPT through Google Classroom or any other relevant social media.
- ✓ Let the learners discuss in the group and submit their response through Google Classroom or any other relevant social media.

D. Assessment:

- ✓ Make learners read INFORMATION SHEET 3.2 and perform OPERATION SHEET 3.2 and assess them using the checklist/performance guide. Provide necessary intervention.
- ✓ Assess learners' knowledge by asking questions.
- ✓ Conduct class test to assess their understanding.
- ✓ Let the learners carry out activities of the SAMPLE SELF CHECK 3.2.
- ✓ Conduct a question-answer session with the learners to assess the learners conceptual understanding of the continuity test using multimeter.

E. **Resources:**

- ✓ CBLM for classes X and XII.
- ✓ Handouts.
- ✓ How to do a Continuity Test With a Multimeter | Repair and Replace - YouTube, MFT1741 Continuity Measurement Test with auto start and audible notice when test is completed - YouTube (Explains about continuity test and its procedures).

A. Competency/Competencies:

- ✓ Perform polarity test to check the presence of live in protective switch gears and switches.

B. Learning objectives/Topic:

Learning objectives	Topic
3.3.1 State the purpose of polarity test 3.3.2 **Use IR tester** *3.3.3 Ensure appropriate use of PPE* *3.3.4 Ensure to follow OHS rules and regulations* *3.3.5 Ensure proper disposal of waste* 3.3.6 *Ensure correct selection of test voltage* 3.3.7 Perform polarity test	3.2 Performing polarity test **Overview:** It is about performing polarity test and it enables the learners to identify the polarity of the switchgear.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 3.3.
- ✓ Provide handouts to learners.
- ✓ Provide web link How to quickly determine the polarity of your DC power supply with a multimeter - YouTube which explains about polarity check with a multi-meter.
- ✓ Make learners perform OPERATION SHEET 3.3.
- ✓ Provide handouts, self-made tutorial video clips, and PPT through Google Classroom or any other relevant social media.
- ✓ Let the learners discuss in the group and submit their response through Google Classroom or any other relevant social media.

D. Assessment:

- ✓ Make learners read INFORMATION SHEET 3.3 and perform OPERATION SHEET 3.3 and assess them using the checklist/performance guide. Provide necessary intervention.
- ✓ Assess learners' knowledge by asking questions.
- ✓ Conduct class test to assess their understanding.
- ✓ Let the learners carry out activities of the SAMPLE SELF CHECK 3.3 and assess their response.
- ✓ Let the learners do the presentation and assess as per the rubric development.
- ✓ Conduct test (both theory and practical) with the learners to assess the learners conceptual understanding of the polarity test.

E. **Resources:**

- ✓ CBLM for classes X and XII.
- ✓ Handouts.
- ✓ How to quickly determine the polarity of your DC power supply with a multimeter - YouTube (Explains how to check the polarity with a multi-meter).

A. Competency/Competencies:

- ✓ Perform polarity test to check the presence of live in protective switch gears and switches

B. Learning objectives/Topic:

Learning objectives	Topic
3.4.1 State earth continuity test 3.4.2 State the importance of earthing 3.4.3 ***Use IR tester*** 3.4.4 *Ensure appropriate use of PPE* 3.4.5 *Ensure to follow OHS rules and regulations* 3.4.6 *Ensure proper disposal of waste* 3.4.7 *Ensure correct selection of test voltage* 3.4.8 Perform earth continuity test	3.3 Performing earth continuity test **Overview:** It is about performing earth continuity test and it enables the learners to identify the leakage from the cable.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 3.4.
- ✓ Provide handouts to learners.
- ✓ Provide web link How to check earthing with multimeter - YouTube which explains about polarity check with a multi-meter.
- ✓ Make learners perform OPERATION SHEET 3.4.
- ✓ Provide handouts, self-made tutorial video clips, and PPT through Google Classroom or any other relevant social media.
- ✓ Let the learners discuss in the group and submit their response through Google Classroom or any other relevant social media.

D. Assessment:

- ✓ Make learners read INFORMATION SHEET 3.3 and perform OPERATION SHEET 3.4 and assess them using the checklist/performance guide. Provide necessary intervention.
- ✓ Assess learners' knowledge by asking questions.
- ✓ Conduct class test to assess their understanding.
- ✓ Let the learners carry out activities of the SAMPLE SELF CHECK 3.4 and assess their response.
- ✓ Let the learners do the presentation and assess as per the rubric development.
- ✓ Conduct test (both theory and practical) with the learners to assess the learners conceptual understanding of the polarity test.

E. **Resources:**

- ✓ CBLM for classes X and XII.
- ✓ Handouts.
- ✓ How to check earthing with multimeter - YouTube (Explains how to check the continuity with a multi-meter).

A. Competency/Competencies:

- ✓ Perform polarity test to check the presence of live in protective switch gears and switches.

B. Learning objectives/Topic:

Learning objectives	Topic
3.5.1 State purpose of earth resistance test 3.5.2 State standard earth resistance for domestic installations 3.5.3 List Methods of testing earth resistance 3.5.4 ***Use earth tester*** *3.5.5 Ensure appropriate use of PPE* *3.5.6 Ensure to follow OHS rules and regulations* *3.5.7 Ensure proper disposal of waste* *3.5.8 Ensure correct selection of test voltage* 3.5.9 Perform earth resistance test	3.5 Performing earth resistance test **Overview:** It is about performing earth continuity test and it enables the learners to identify the leakage from the cable.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 3.5.
- ✓ Provide handouts to learners.
- ✓ Provide web link Earth Continuity Test - YouTube which explains about earth resistance test.
- ✓ Make learners perform OPERATION SHEET 3.5.
- ✓ Provide handouts, self-made tutorial video clips, and PPT through Google Classroom or any other relevant social media.
- ✓ Let the learners discuss in the group and submit their response through Google Classroom or any other relevant social media.

D. **Assessment:**

- ✓ Make learners read INFORMATION SHEET 3.5 and perform OPERATION SHEET 3.5 and assess them using the checklist/performance guide. Provide necessary intervention.
- ✓ Assess learners' knowledge by asking questions.
- ✓ Conduct class test to assess their understanding.
- ✓ Let the learners carry out activities of the SAMPLE SELF CHECK 3.5 and assess their response.

- ✓ Let the learners do the presentation and assess as per the rubric development.
- ✓ Conduct test (both theory and practical) with the learners to assess the learners conceptual understanding of the polarity test.

E. **Resources:**

- ✓ CBLM for classes X and XII.
- ✓ Handouts.
- ✓ Earth Continuity Test - YouTube (Explains how to perform earth resistance test using megger).

A. Competency/Competencies:

- ✓ Perform soil resistivity test to check the resistivity of the soil.

B. Learning objectives/Topic:

Learning objectives	Topic
3.6.1 State the purpose of soil resistivity test 3.6.2 Calculate the soil resistivity 3.6.3 List methods of soil resistivity test 3.6.4 ***Use IR tester*** *3.6.5 Ensure appropriate use of PPE* 3.6.6 *Ensure to follow OHS rules and regulations* 3.6.7 *Ensure proper disposal of waste* *3.6.8* Perform soil resistivity test	3.6 Performing soil resistivity test **Overview:** It is about performing soil resistivity test and it enables the learners to identify the resistivity of the soil to install earthing.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 3.6.
- ✓ Provide handouts to learners.
- ✓ Provide web link Earth Continuity Test - YouTube which explains about earth resistance test.
- ✓ Make learners perform OPERATION SHEET 3.6.
- ✓ Provide handouts, self-made tutorial video clips, and PPT through Google Classroom or any other relevant social media.
- ✓ Let the learners discuss in the group and submit their response through Google Classroom or any other relevant social media.

D. Assessment:

- ✓ Make learners read INFORMATION SHEET 3.6 and perform OPERATION SHEET 3.6 and assess them using the checklist/performance guide. Provide necessary intervention.
- ✓ Assess learners' knowledge by asking questions.
- ✓ Conduct class test to assess their understanding.
- ✓ Let the learners carry out activities of the SAMPLE SELF CHECK 3.6 and assess their response.
- ✓ Let the learners do the presentation and assess as per the rubric development.

- ✓ Conduct test (both theory and practical) with the learners to assess the learners conceptual understanding of the soil resistivity.

E. Resources:

- ✓ CBLM for classes X and XII.
- ✓ Handouts.
- ✓ Earth Continuity Test - YouTube (Explains how to perform earth resistance test using megger).

A. Competency/Competencies:

- ✓ Troubleshooting of fluorescent lamp/LED and fitting to identify the problem of fluorescent lamp/LED and fitting and to fix the problems.

B. Learning objectives/Topic:

Learning objectives	**Topic**
4.1.1 List types of fluorescent tube/LED 4.1.2 Explain the Working principle of fluorescent tube/ LED 4.1.3 List the components of fluorescent tube and its function 4.1.4 State the symptoms, causes and remedies of faults in fluorescent tube 4.1.5 ***Use multi-meter*** 4.1.6 ***Use test lamp*** 4.1.7 *Ensure to follow OHS rules and regulations* 4.1.8 *Ensure appropriate use of PPE* 4.1.9 *Ensure proper disposal of waste*	4.1 Troubleshooting fluorescent lamp/ LED and fitting **Overview:** It is about troubleshooting of fluorescent lamp/LED and fitting and it enables learners to identify the problem of fluorescent lamp/LED and fitting and fix the problems.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 4.1.
- ✓ Provide handouts to learners.
- ✓ Make learners perform OPERATION SHEET 4.1.
- ✓ Provide handouts, self-made tutorial video clips, and PPT through Google Classroom or any other relevant social media.
- ✓ Let the learners discuss in the group and submit their response through Google Classroom or any other relevant social media.
- ✓ Provide web link Provide web link How To Fix Flickering LED Ceiling Lamp - YouTube which explains about troubleshoot LED.
- ✓ which explains about troubleshoot fan.

D. **Assessment:**

- ✓ Make learners read INFORMATION SHEET 4.1 and perform OPERATION SHEET 4.1 and assess them using the checklist/performance guide. Provide necessary intervention.

- ✓ Assess learners' knowledge by asking questions.
- ✓ Conduct class test to assess their understanding.
- ✓ Let the learners carry out activities of the SAMPLE SELF CHECK 4.1 and assess their response.
- ✓ Let the learners do the presentation and assess as per the rubric development.
- ✓ Conduct test (both theory and practical) with the learners to assess the learners conceptual understanding of the troubleshooting of fluorescent lamp/LED.

E. Resources:

- ✓ CBLM for classes X and XII.
- ✓ Handouts.
- ✓ How To Fix Flickering LED Ceiling Lamp - YouTube

A. Competency/Competencies:

- ✓ Troubleshooting of fan and fitting to identify the problem of fan and fitting and to fix the problems.

B. Learning objectives/Topic:

Learning objectives	**Topic**
4.2.1 List types of fans 4.2.2 State the function of fan components 4.2.3 Explain the working principle of fan 4.2.4 State the symptoms, cause and remedies of faults in a fan *4.2.5* ***Use multi-meter*** *4.2.6 Ensure OHS rules and regulations* *4..2.7 Ensure to follow PPE*	4.2 Troubleshooting fan and fitting **Overview:** It is about troubleshooting of fan and fitting and it enables learners to identify the problem of fan and fitting and fix the problems.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 4.2.
- ✓ Provide handouts to learners.
- ✓ Make learners perform OPERATION SHEET 4.2.
- ✓ Provide handouts, self-made tutorial video clips, and PPT through Google Classroom or any other relevant social media.
- ✓ Let the learners discuss in the group and submit their response through Google Classroom or any other relevant social media.

D. Assessment:

- ✓ Make learners read INFORMATION SHEET 4.2 and perform OPERATION SHEET 4.2. and assess them using the checklist/performance guide. Provide necessary intervention.
- ✓ Assess learners' knowledge by asking questions.
- ✓ Conduct class test to assess their understanding.

- ✓ Let the learners carry out activities of the SAMPLE SELF CHECK 4.2 and assess their response.
- ✓ Let the learners do the presentation and assess as per the rubric development.
- ✓ Conduct test (both theory and practical) with the learners to assess the learners conceptual understanding of the troubleshooting of fan.

E. Resources:

- ✓ CBLM for classes X and XII.
- ✓ Handouts.

A. Competency/Competencies:

- ✓ Troubleshooting of High Intensity Discharges (HID) lamp and fitting to identify the problem of High Intensity Discharges (HID) lamp and fitting and to fix the problems.

B. Learning objectives/Topic:

Learning objectives	Topic
4.3.1 List types of HID lamp 4.3.2 State the function of HID lamp components 4.3.3 Explain the working principle of HID Lamp 4.3.4 State the Symptoms, causes and remedies of faults in HID lamp and fitting *4.3.5* ***Use Multi-meter*** *4.3.6* ***Interpret circuit diagram*** *4.3.7 Ensure to follow OHS rules and regulations* *4.3.8 Ensure appropriate use of PPE*	4.3 Troubleshooting High Intensity Discharges (HID) lamp and fitting **Overview:** It is about troubleshooting of High Intensity Discharges (HID) lamp and fitting and it enables learners to identify the problem of High Intensity Discharges (HID) lamp and fitting and fix the problems.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 4.3.
- ✓ Provide handouts to learners.
- ✓ Make learners perform OPERATION SHEET 4.3.
- ✓ Provide handouts, self-made tutorial video clips, and PPT through Google Classroom or any other relevant social media.
- ✓ Let the learners discuss in the group and submit their response through Google Classroom or any other relevant social media.

D. Assessment:

- ✓ Make learners read INFORMATION SHEET 4.3 and perform OPERATION SHEET 4.3 and assess them using the checklist/performance guide. Provide necessary intervention.
- ✓ Assess learners' knowledge by asking questions.
- ✓ Conduct class test to assess their understanding.
- ✓ Let the learners carry out activities of the SAMPLE SELF CHECK 4.3 and assess their response
- ✓ Let the learners do the presentation and assess as per the rubric development.

- ✓ Conduct test (both theory and practical) with the learners to assess the learners conceptual understanding of the troubleshooting High Intensity Discharges (HID) lamp.

E. Resources:

- ✓ CBLM for classes X and XII.
- ✓ Handouts.

Chapter 5: Estimating materials

A. Competency/Competencies:

- ✓ Estimate materials for PVC casing and capping wiring.

B. Learning objectives/Topic:

Learning objectives	Topic
5.1.1 Introduce to basic estimation and costing 5.1.2 State the purpose of basic estimation and costing 5.1.3 State the methods of basic estimation and costing *5.1.4* ***Interpret drawings*** *5.1.5* ***Interpret Bhutan Schedule of Rates (BSR) and Labour and Material Coefficient (LMC)*** *5.1.6 Being time conscious* *5.1.7 Being efficient in using resources*	5.1 Estimating materials for PVC casing and capping wiring **Overview:** It is about estimating materials for PVC casing and capping and it enables the learners to estimate materials for house wiring.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 5.1.
- ✓ Provide handouts to learners.
- ✓ Make learners perform OPERATION SHEET 5.1.
- ✓ Provide handouts, self-made tutorial video clips, and PPT through Google Classroom or any other relevant social media.
- ✓ Let the learners discuss in the group and submit their response through Google Classroom or any other relevant social media.

D. Assessment:

- ✓ Make learners read INFORMATION SHEET 5.1 and perform OPERATION SHEET 5.1 and assess them using the checklist/performance guide. Provide necessary intervention.
- ✓ Assess learners' knowledge by asking questions.
- ✓ Conduct class test to assess their understanding.
- ✓ Let the learners carry out activities of the SAMPLE SELF CHECK 5.1 and assess their response.
- ✓ Let the learners do the presentation and assess as per the rubric development.
- ✓ Conduct test (both theory and practical) with the learners to assess the learners conceptual understanding on casing capping.

E. Resources:

- ✓ CBLM for classes X and XII.
- ✓ Handouts.

A. Competency/Competencies:

- ✓ Estimating materials for Poly Vinyl Chloride (PVC) conduit wiring.

B. Learning objectives/Topic:

Learning objectives	Topic
5.2.1 State the methods of estimation and costing 5.2.2 List rules for estimation 5.2.3 ***Interpret drawings*** 5.2.4 *Being time conscious* *5.2.5 Being efficient in using resources*	5.2 Estimating materials for Poly Vinyl Chloride (PVC) conduit wiring **Overview:** It is about estimating materials for Poly Vinyl Chloride (PVC) conduit wiring and it enables the learners to estimate materials for house wiring.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 5.2
- ✓ Provide handouts to learners
- ✓ Make learners perform OPERATION SHEET 5.2
- ✓ Provide handouts, self-made tutorial video clips, and PPT through Google Classroom or any other relevant social media.
- ✓ Let the learners discuss in the group and submit their response through Google Classroom or any other relevant social media

D. **Assessment:**

- ✓ Make learners read INFORMATION SHEET 5.2 and perform OPERATION SHEET 5.2 and assess them using the checklist/performance guide. Provide necessary intervention.
- ✓ Assess learners' knowledge by asking questions.
- ✓ Conduct class test to assess their understanding.
- ✓ Let the learners carry out activities of the SAMPLE SELF CHECK 5.2 and assess their response.
- ✓ Let the learners do the presentation and assess as per the rubric development.
- ✓ Conduct test (both theory and practical) with the learners to assess the learners conceptual understanding of the PVC conduit wiring.

E. Resources:

- ✓ CBLM for classes X and XII.
- ✓ Handouts.

A. Competency/Competencies:

- ✓ Estimate materials for Mild steel (MS) conduit wiring

B. Learning objectives/Topic:

Learning objectives	Topic
5.3.1 List methods of estimation and costing 5.3.2 List Rules of estimation 5.3.3 ***Interpret drawing*** 5.3.4 *Being time conscious* *5.3.5 Being efficient in using resources*	5.3 Estimating materials for Mild Steel (MS) conduit wiring **Overview:** It is about Estimate materials for Mild steel (MS) conduit wiring and it enables the learners to estimate MS conduit wiring.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 5.3.
- ✓ Provide handouts to learners.
- ✓ Make learners perform OPERATION SHEET 5.3.
- ✓ Provide handouts, self-made tutorial video clips, and PPT through Google Classroom or any other relevant social media.
- ✓ Let the learners discuss in the group and submit their response through Google Classroom or any other relevant social media.

D. Assessment:

- ✓ Make learners read INFORMATION SHEET 5.3 and perform OPERATION SHEET 5.3 and assess them using the checklist/performance guide. Provide necessary intervention.
- ✓ Assess learners' knowledge by asking questions.
- ✓ Conduct class test to assess their understanding.
- ✓ Let the learners carry out activities of the SAMPLE SELF CHECK 5.3 and assess their response.
- ✓ Let the learners do the presentation and assess as per the rubric development.
- ✓ Conduct test (both theory and practical) with the learners to assess the learners conceptual understanding of the MS conduit wiring.

E. Resources:

- ✓ CBLM for classes X and XII.
- ✓ Handouts.

A. Competency/Competencies:

- ✓ Estimate materials for concealed HDPE pipe wiring.

B. Learning objectives/Topic:

Learning objectives	Topic
5.4.1 List methods of estimation and costing 5.4.2 List rules for estimation 5.4.3 ***Interpret drawing*** 5.4.4 *Being time conscious* *5.4.5Being efficient in using resources*	5.4 Estimating materials for concealed HDPE pipe wiring **Overview:** It is about estimating materials for concealed HDPE pipe wiring and it enables the learners to estimate HDPE concealed wiring.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 5.4.
- ✓ Provide handouts to learners.
- ✓ Make learners perform OPERATION SHEET 5.4.
- ✓ Provide handouts, self-made tutorial video clips, and PPT through Google Classroom or any other relevant social media.
- ✓ Let the learners discuss in the group and submit their response through Google Classroom or any other relevant social media.

D. Assessment:

- ✓ Make learners read INFORMATION SHEET 5.4 and perform OPERATION SHEET 5.4 and assess them using the checklist/performance guide. Provide necessary intervention.
- ✓ Assess learners' knowledge by asking questions.
- ✓ Conduct class test to assess their understanding.
- ✓ Let the learners carry out activities of the SAMPLE SELF CHECK 5.4 and assess their response.
- ✓ Let the learners do the presentation and assess as per the rubric development.
- ✓ Conduct test (both theory and practical) with the learners to assess the learners conceptual understanding of the HDPE concealed wiring.

E. Resources:

- ✓ CBLM for classes X and XII
- ✓ Handouts

Resources

1. Technical and Vocational Education and Training (TVET) New Normal Curriculum framework (Class: PP-XII)
2. Competency-Based Learning Materials (Electrical)