

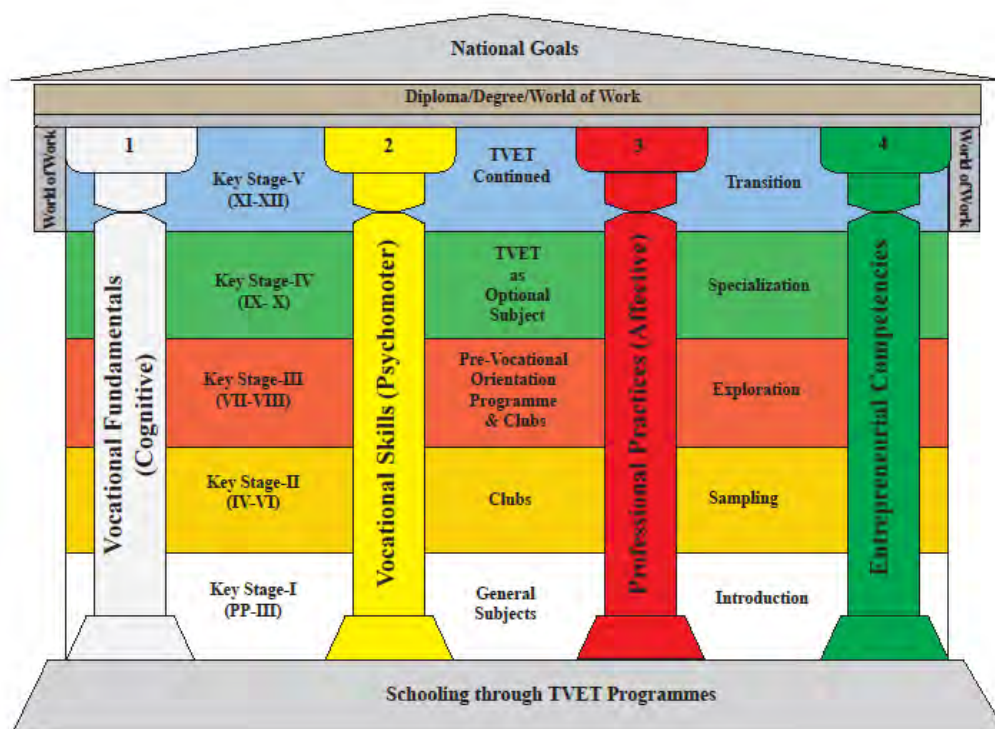
TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING (TVET)

NEW NORMAL CURRICULUM

INSTRUCTIONAL GUIDE

(COMPUTER HARDWARE AND NETWORKING)

CLASS: XII



Royal Education Council

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FOREWORD

COVID-19 has suddenly caused unforgiving disruptions in the 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 learning and teaching in traditional settings with physical interactions to the maximum in terms of relevancy and efficiency. This has caused a major problem for children living in poverty worldwide, who often rely on the physical settings of their schools for educational materials, guidance, and, sometimes, the only decent meal of the day.

In the new normal education, human interaction and well-being is a priority. Technology, particularly digital technology that enables communication, collaboration and learning across distance, is a formidable tool – not a panacea but 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 will 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 New Normal 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 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.

Kinga Dakpa,

Director General

INTRODUCTION

Technical and Vocational Education and Training (TVET) is education and training which provides knowledge and skills for employment. It comprises of education, training and skills development related to a wide range of occupational fields, production, services and livelihood. The Royal Education Council and Ministry of Education envisage 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) under the Ministry of Education 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 under Ministry of Education, 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 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 New Normal Curriculum Instructional Guide is prepared not only to encourage blended learning but also to facilitate remote learning. Thus, the guide would help the schools to implement the curriculum effectively without limiting to contact teaching/learning besides using a variety of pedagogies.

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MODULE-II PERFORMING TROUBLESHOOTING OF COMPUTER SYSTEM AND DEVICES

Chapter 3: Rectifying PC components (Laptop/Palmtop)

A. Learning objectives/Broad theme/strand/chapter:

Learning Objective	Topic
3.6.1 Explain the types of a cooling medium. 3.6.2 Identify area/components for application of spray 3.6.3 State the function of the CPU fan, GPU, and heat sink. <i>3.6.4 Ensure safe handling of tools and materials</i> <i>3.6.5 Ensure not to apply spray-on delicate components</i> <i>3.6.6 Ensure to wear an ESD wristband</i> <i>3.6.7 Ensure not to apply excessive thermal paste on CPU</i> <i>3.6.8 Service cooling medium</i>	3.6 Servicing cooling medium

B. Competencies:

- Service cooling medium when the system restarts frequently, BSOD errors occur and internal components are damaged due to overheating

C. Pedagogy/Learning Experiences

Contact:

- Let the learners read INFORMATION SHEET 3.6
- Provide ICT (PPT/PDF), handouts, demonstration, and short video clips to explain types of cooling medium.
- Demonstrate OPERATION SHEET 3.6.
- Let the learners PERFORM OPERATION SHEET 3.6
- Let the learners solve SAMPLE OPERATION SHEET 3.6

Non-contact:

- Let the learners read INFORMATION SHEET 3.6

- Share the web link <https://www.youtube.com/watch?v=GGvUHeoDbQo> to learn about servicing colling mediums.
- The teacher may provide handouts and PPT/PDF through Google Classroom/social media.
- Let the learners solve SAMPLE OPERATION SHEET 3.6
- Provide additional questions.

D. Assessment:

Contact:

- Assessing learners while performing OPERATION SHEET 3.6.
- Assess the learners’ response on SAMPLE SELF CHECK 3.6
- Assess learner’s knowledge about servicing cooling medium by asking questions.
- Conduct class tests to assess their understanding.

Non-contact:

- Assess the learners’ response on SAMPLE SELF CHECK 3.6
- Assess the learner’s answers posted in Google Classroom/social media using the rubric

E. Resources (online and offline):

- Competency-Based Learning Materials for Classes IX and X, REC
- Handouts
- <https://www.youtube.com/watch?v=GGvUHeoDbQo> (Explanation on servicing cooling medium)

A. Learning objectives/Broad theme/strand/chapter:

Learning Objective	Topic
3.7.1 Explain the troubleshooting of the motherboard 3.7.2 Explain motherboard compatibility 3.7.3 List components of the motherboard 3.7.4 <i>Ensure to wear an ESD wristband.</i> 3.7.5 <i>Ensure proper disposal of the used motherboard</i> 3.7.6 <i>Ensure to check the compatibility of the motherboard before replacing</i> 3.7.7 <i>Replace motherboard</i>	3.7 Replace motherboard

B. Competencies:

- Troubleshoot computer system and devices (PC faults and software faults) of any computer

C. Pedagogy/Learning Experiences**Contact:**

- Let the learners read INFORMATION SHEET 3.7
- Provide ICT (PPT/PDF), handouts, demonstration, and short video clips to explain types of cooling medium.
- Demonstrate OPERATION SHEET 3.7
- Let the learners PERFORM OPERATION SHEET 3.7
- Let the learners solve SAMPLE OPERATION SHEET 3.7

Non-contact:

- Let the learners read INFORMATION SHEET 3.7
- The teacher may provide handouts and PPT/PDF through Google Classroom/social media.
- Share the web link <https://www.youtube.com/watch?v=mZlh9hp4INM> to learn about replacing the motherboard and make note of steps. Submit it through Google Classroom and social media.
- Let the learners solve SAMPLE OPERATION SHEET 3.7

D. Assessment:**Contact:**

- Assessing learner's information as they PERFORM OPERATION SHEET 3.7.
- Assess learner's knowledge about servicing cooling medium by asking questions.
- Conduct class tests to assess their understanding.
- Conduct viva to assess their understanding.
- Assess the learners' response on SAMPLE SELF CHECK 3.7

Non-contact:

- Assess learners through work submitted on Google Classroom/social media.
- Assess the learners' response on SAMPLE SELF CHECK 3.7
- Conduct class tests online through Google Classroom/social media.

E. Resources (online and offline):

- Competency-Based Learning Materials for Classes IX and X, REC
- Handouts
- <https://www.youtube.com/watch?v=mZlh9hp4INM> (Explanation on replacing the motherboard)

Chapter 4: Rectifying peripheral devices

A. Learning objectives/Broad theme/strand/chapter:

Learning Objective	Topic
4.1.1. Categorize types of printer, brand and its specification 4.1.2. Classify types of cartridge 4.1.3. State functions of cartridge 4.1.4. Explain the importance of removing protected plastic 4.1.5. Remove Jammed paper 4.1.6. Ensure no paper fragment are left inside 4.1.7. Ensure proper handling of equipment and materials 4.1.8. Service printer	3.6 Servicing printer

B. Competencies:

- Service printer when the paper gets frequently jammed.

C. Pedagogy/Learning Experiences

Contact:

- Let the learners read INFORMATION SHEET 4.1
- The teacher may demonstrate SKILL SHEET 4.1 and OPERATION SHEET 4.1
- Let the learners perform SKILL SHEET 4.1.
- Let the learners perform OPERATION SHEET 4.1.
- Let the learner solve SAMPLE SELF CHECK 4.1

Non-contact:

- Let the learners read INFORMATION SHEET 4.1
- Share the web link <https://www.youtube.com/watch?v=3GIQkO51gQw> to learn removing of jammed paper in the printer.
- Share the web link <https://www.youtube.com/watch?v=-Ff6t7VtOjs&t=35s> to learn how to service the printer.
- Let learners do project work on the topic printer.
- Let the learner solve SAMPLE SELF CHECK 4.1

D. Assessment:

Contact:

- Let the learners perform OPERATION SHEET 4.1
- Let the learners solve SAMPLE SELF CHECK 4.1
- Conduct a question-answer session.
- Provide additional questions.

Non-contact:

- Assess learners through project work submitted on Google Classroom/social media.
- Let learners solve self-check 4.1.

E. Resources (online and offline):

- Competency-Based Learning Materials for Classes IX and X, REC
- Handouts
- <https://www.youtube.com/watch?v=3GIQkO51gQw> (Explanation on removing jammed paper)
- <https://www.youtube.com/watch?v=-Ff6t7VtOjs&t=35s> (Explanation on servicing printer)

A. Learning objectives/Broad theme/strand/chapter:

Learning Objective	Topic
4.2.1 Categorize types of photocopier machine and specification 4.2.2 State the types of Cartridge and their functions 4.2.3 Explain the causes of paper jam 4.2.4 <i>Ensure power is off before service starts</i> 4.2.5 <i>Ensure no paper fragments are left behind</i> 4.2.6 <i>Ensure roller and cooper is not broken or loosen</i> 4.2.7 <i>Ensure cartridge is inserted</i> 4.2.8 <i>Ensure to use PPE</i> 4.2.9 <i>Ensure to avoid touching any metallic surface in the fuser area.</i> 4.2.10 <i>Service photocopier machine</i>	3.6 Servicing photocopier machine

B. Competencies:

- Service photocopier machine when periodic maintenance is done as per the operational manual of the machine

C. Pedagogy/Learning Experiences

Contact:

- Let the learners read INFORMATION SHEET 4.2
- Let learners be in a group and assign a topic each to a group. Let learners explore the information and let them present it to the class.
- The teacher may demonstrate OPERATION SHEET 4.2
- Let the learners perform OPERATION SHEET 4.2
- Let the learner solve SAMPLE SELF CHECK 4.2

Non-contact:

- Let the learners read INFORMATION SHEET 4.2
- The teacher may provide a handout, ICT (PPT/PDF), and short video clips to explain how to do the servicing of a photocopier machine.
 - ✓ Let learners make a note of which materials/tools are used to clean the photocopier machine and submit it through Google Classroom /social media.
- Let the learner solve SAMPLE SELF CHECK 4.2
- Provide additional questions.

D. Assessment:

Contact:

- Assess the learners' performance referring to OPERATION SHEET 4.2
- Assess learners based on the group presentation using the rubric.
- Assess the learner's responses on SAMPLE SELF CHECK 4.2
- Conduct viva to assess their understanding of servicing photocopier machines.

Non-contact:

- Assess learners through their notes submitted in Google Classroom.
- Assess the learner's responses on SAMPLE SELF CHECK 4.2
- Assess the learner's answers posted in Google Classroom /social media.

E. Resources (online and offline):

- Competency-Based Learning Materials for Classes IX and X, REC
- Handouts

Learning Objective	Topic
4.3.1 Categorize types of scanner and specification 4.3.2 State functions of the scanner glass and ADF 4.3.3 List types of cleaning material 4.3.4 <i>Use manual guide</i> 4.3.5 <i>Ensure power is off before cleaning</i> 4.3.6 <i>Ensure not to use hard substances to scrub or wipe the glass</i> 4.3.7 <i>Ensure not to apply too much force on the glass</i> 4.3.8 <i>Ensure not to use a thinner or corrosive solvent to clean the glass surface</i> 4.3.9 <i>Ensure not to spill the liquid into the scanner mechanism or electronic component</i> 4.3.10 <i>Be patient while servicing the scanner</i> 4.3.11 <i>Service scanner</i>	4.3 Servicing scanner

B. Competencies:

- Service scanner when scanned documents are not clear or dark.

C. Pedagogy/Learning Experiences

Contact:

- Let the learners read INFORMATION SHEET 4.3
- The teacher may demonstrate OPERATION SHEET 4.3
- Let the learners perform OPERATION SHEET 4.3
- Let the learner solve SAMPLE SELF CHECK 4.3

Non-contact:

- Let the learners read INFORMATION SHEET 4.3
- The teacher may provide handouts.
- Share the web link <https://www.youtube.com/watch?v=xHVjkh-F65Y> to learn the servicing of a scanner.
Let learners take note of which materials/tools are required to clean the scanner.
- Let the learner solve SAMPLE SELF CHECK 4.3

D. Assessment:

Contact:

- Assess the learners base on the performance of OPERATION SHEET 4.3
- Assess learners based on the group presentation using the rubric.
- Assess the learner’s response on SAMPLE SELF CHECK 4.3
- Conduct viva to assess their understanding of servicing photocopy machines.

Non-contact:

- Assess learners through their work submitted in Google Classroom.
- Assess the learner’s responses on SAMPLE SELF CHECK 4.3
- Conduct live question-answer sessions through Google Classroom/social media.

E. Resources (online and offline):

- Competency-Based Learning Materials for Classes IX and X, REC
- Handouts
- <https://www.youtube.com/watch?v=xHVjkh-F65Y> (Explanation on servicing a photocopy machine).

MODULE 3: PERFORMING INSTALLATION AND CONFIGURATION OF NETWORK

Chapter 1: Installing network

A. Learning objectives/Broad theme/strand/chapter:

Learning Objective	Topic
1.1.1 Explain IP addresses 1.1.2 Interpret sub-netting IP addresses 1.1.3 Calculate distance unit. 1.1.4 Be patient while designing a network topology 1.1.5 Design topology	1.1 Designing network topology

- **Competencies:**
- Design network topology when client demands or faulty network topology needs to be replaced.

- **Pedagogy/Learning Experiences**

- **Contact:**

- Let the learners read INFORMATION SHEET 1.1
- Let learners be in a group and design the network topology of the school.
- The teacher may demonstrate OPERATION SHEET 1.1
- Let the learners perform OPERATION SHEET 1.1
- Let the learner solve SAMPLE SELF CHECK 1.1

- **Non-contact:**

- Let the learners read INFORMATION SHEET 1.1
- The teacher may provide handouts and PPT/PDF.
- Share the web link <https://www.slideshare.net/shudola/network-topology-72898027> to learn different types of topology along with their advantages and disadvantages.
- Let learners design the network topology diagram of the school.
- Let the learner solve SAMPLE SELF CHECK 1.1

- **Assessment:**

- **Contact:**

- Assess the learner's performance on OPERATION SHEET 1.1
- Assess learners based on the design of the network topology of a school.
- Assess the learner's performance on SAMPLE SELF CHECK 1.1
- Conduct class tests to assess their understanding.

- **Non-contact:**

- Assess learners through their network topology design submitted in Google Classroom.
- Assess the learners' performance on SAMPLE SELF CHECK 1.1

- **Resources (online and offline):**

- Competency-Based Learning Materials for Classes IX and X, REC
- Handouts
- <https://www.slideshare.net/shudola/network-topology-72898027> (Explanation on different types of network topology).

A. Learning objectives/Broad theme/strand/chapter:

Learning Objective	Topic
1.2.1 Explain the method of preparing the estimation sheet 1.2.2 Estimate specification and cost of equipment and materials 1.2.3 Maintain work ethic and integrity while estimating the cost 1.2.4 Estimate the cost.	1.2 Estimating the cost

B. Competencies:

- Estimating the cost when there is demand/request for providing service.

C. Pedagogy/Learning Experiences

Contact:

- Let the learners read INFORMATION SHEET 1.2
- The teacher may demonstrate OPERATION SHEET 1.2
- Let the learners perform OPERATION SHEET 1.2
- Let the learner solve SAMPLE SELF CHECK 1.2

Non-contact:

- Let the learners read INFORMATION SHEET 1.2
- Provide handouts and PPT/PDF.
- Let the learner solve SAMPLE SELF CHECK 1.2

D. Assessment:

Contact:

- Assess the learner's performance on OPERATION SHEET 1.1
- Let learners be in a group and let them estimate the cost if they are designing a network topology for the school.
- Assess the learner's performance on SAMPLE SELF CHECK 1.1

Non-contact:

- Assess the learner's performance on SAMPLE SELF CHECK 1.1

E. Resources (online and offline):

- Competency-Based Learning Materials for Classes IX and X, REC
- Handouts

A. Learning objectives/Broad theme/strand/chapter:

Learning Objective	Topic
1.2.1 Identify the category of cables 1.2.2 State types of connection and their application 1.2.3 Categorize color code of cable 1.2.4 List types of network cables <i>1.2.5 Use cable tester</i> <i>1.2.6 Use Crimping tools</i> <i>1.2.7 Ensure to cut the cable keeping minimum of 5cm extra from the actual length</i> <i>1.2.8 Lay network cables</i>	1.3 Laying Network cables

• Competencies:

- Laying network cable when setting up a new network or replacing existing cables.

• Pedagogy/Learning Experiences

Contact:

- Let the learners read INFORMATION SHEET 1.3
- The teacher may demonstrate OPERATION SHEET 1.3
- Let the learners perform OPERATION SHEET 1.3
- Let the learner solve SAMPLE SELF CHECK 1.3

Non-contact:

- Let the learners read INFORMATION SHEET 1.3
- The teacher may provide handouts.

- The teacher may provide the web link https://www.youtube.com/watch?v=_NX99ad2FUA to learn different types of ethernet cables.
- Let the learner solve SAMPLE SELF CHECK 1.3
- Provide questions.
- **Assessment:**
 - **Contact:**
 - Assess learner’s performance on OPERATION SHEET 1.3
 - Assess learner’s responses on SAMPLE SELF CHECK 1.3
 - Conduct class tests to assess their understanding.
 - Provide questions.
 - **Non-contact:**
 - Assess learners through their responses posted in Google Classroom /social media using the rubric.
 - Assess learner’s responses on SAMPLE SELF CHECK 1.3
 - Assess the learner’s base on answers posted in Google Classroom /social media.
- **Resources (online and offline):**
 - Competency-Based Learning Materials for Classes IX and X, REC
 - Handouts
 - https://www.youtube.com/watch?v=_NX99ad2FUA (Explanation on different types of ethernet cables).

A. Learning objectives/Broad theme/strand/chapter:

Learning Objective	Topic
1.4.1 List types of switch 1.4.2 Number of Port 1.4.3 Bandwidth 1.4.4 State function and parts of the network switch 1.4.5 Use drilling machine <i>1.4.6 Ensure appropriate use of PPE (Dust mask, Safety Goggles)</i> <i>1.4.7 Install switch</i>	1.4 Installing Switch

B. Competencies:

- Install switch when a new network is set up or replacing a faulty switch.

C. Pedagogy/Learning Experiences

Contact:

- Let the learners read INFORMATION SHEET 1.4
- The teacher may demonstrate OPERATION SHEET 1.4
- Let the learners perform OPERATION SHEET 1.4
- Let the learner solve SAMPLE SELF CHECK 1.4

Non-contact:

- Let the learners read INFORMATION SHEET 1.4
- The teacher may provide handouts.
- Share the web link <https://www.youtube.com/watch?v=KBHyDd2cJBs> to learn how to set up an ethernet switch. Pause the video and make note of it.
- Let the learner solve SAMPLE SELF CHECK 1.4

D. Assessment:

Contact:

- Assess the learners while performing OPERATION SHEET 1.4 using the rubric.
- Assess the learner's responses on SAMPLE SELF CHECK 1.4

Non-contact:

- Assess learners through their responses posted in Google Classroom social media using the rubric.
- Assess the learner's responses on SAMPLE SELF CHECK 1.4

E. Resources (online and offline):

- Competency-Based Learning Materials for Classes IX and X, REC
- Handouts
- <https://www.youtube.com/watch?v=KBHyDd2cJBs> (Explanation on setting up ethernet switch).

A. Learning objectives/Broad theme/strand/chapter:

Learning Objective	Topic
1.5.1 Explain the function and importance of a firewall 1.5.2 Identify parts of a firewall device. 1.5.3 State basic configuration of a firewall 1.5.4 Identify an appropriate location for the installation of the firewall device <i>1.5.5 Ensure to choose strong passwords</i> <i>1.5.6 Install a firewall device</i>	1.5 Installing a firewall device

B. Competencies:

- Install firewall device when the network requires security

C. Pedagogy/Learning Experiences

Contact:

- Let the learners read INFORMATION SHEET 1.5
- Let learners draw a firewall device and label its part.
- The teacher will provide a web link <https://www.youtube.com/watch?v=SrXLJ-2Kfzw> to learn how to set up firewall devices before performing PRACTICAL SHEET 1.5.
- The teacher may demonstrate OPERATION SHEET 1.5
- Let the learners perform OPERATION SHEET 1.5
- Let the learner solve SAMPLE SELF CHECK 1.5
- Provide additional questions

Non-contact:

- Let the learners read INFORMATION SHEET 1.5
- The teacher may provide handouts.
- The teacher may provide the web link <https://www.youtube.com/watch?v=SrXLJ-2Kfzw> to learn how to set up a firewall device and make notes of the steps to set up a firewall device.
- Let the learner solve SAMPLE SELF CHECK 1.5
- Provide additional questions

D. Assessment:

Contact:

- Assess the learners while performing OPERATION SHEET 1.5 using the rubric.
- Assess the learners the responses on SAMPLE SELF CHECK 1.5
- Assess the learner's answers posted in Google Classroom /social media
- Conduct class tests.

Non-contact:

- Assess the learners the responses on SAMPLE SELF CHECK 1.5
- Assess the learner's answers posted in Google Classroom /social media

E. Resources (online and offline):

- Competency-Based Learning Materials for Classes IX and X, REC
- Handouts
- <https://www.youtube.com/watch?v=SrXLJ-2Kfzw> (Explanation on setting up firewall device).

A. Learning objectives/Broad theme/strand/chapter:

Learning Objective	Topic
1.6.1 State function of I/O box. 1.6.2 Categorize color-coding cables for the I/O box 1.6.3 <i>Use the punching tool</i> 1.6.4 <i>Use drilling machine</i> 1.6.5 <i>Ensure to use appropriate PPE</i> 1.6.6 <i>Ensure to punch with correct color coding</i> 1.6.7 <i>Fix I/O box</i>	1.6 Fixing I/O box

B. Competencies:

- Fix I/O box when new network setup or additional nodes required

C. Pedagogy/Learning Experiences

Contact:

- Let the learners read INFORMATION SHEET 1.6
- The teacher may demonstrate OPERATION SHEET 1.6
- Let the learners perform OPERATION SHEET 1.6

- Let the learner solve SAMPLE SELF CHECK 1.6

Non-contact:

- Let the learners read INFORMATION SHEET 1.6
- The teacher may provide handouts.
- Share the web link <https://www.youtube.com/watch?v=2SWPAeCFKdo> to learn how to punch the I/O box.
- Let the learner solve SAMPLE SELF CHECK 1.6

D. Assessment:

Contact:

- Assess the learners while performing OPERATION SHEET 1.6 using the rubric.
- Assess the learner's responses on SAMPLE SELF CHECK 1.6
- Conduct viva and class test to assess their understanding of fixing the I/O box.

Non-contact:

- Assess the learner's responses on SAMPLE SELF CHECK 1.6

E. Resources (online and offline):

- Competency-Based Learning Materials for Classes IX and X, REC
- Handouts
- <https://www.youtube.com/watch?v=2SWPAeCFKdo> (Explanation on punching I/O box).

A. Learning objectives/Broad theme/strand/chapter:

Learning Objective	Topic
1.2.1 List color coding of UTP cable 1.2.2 Differentiate crossover and straight-through UTP cable 1.2.3 List types of network cable. <i>1.2.4 Ensure safe handling of tools and materials</i> <i>1.2.5 Crimp RJ-45 connector</i>	1.7 Crimping RJ-45 connector

B. Competencies:

- Crimp RJ45 connector when the cable is damaged or preparing a new cable.

C. Pedagogy/Learning Experiences

Contact:

- Let the learners read INFORMATION SHEET 1.7
- The teacher may demonstrate OPERATION SHEET 1.7
- Let the learners perform OPERATION SHEET 1.7
- Let the learner solve SAMPLE SELF CHECK 1.7
- Provide additional questions.

Non-contact:

- Let the learners read INFORMATION SHEET 1.7
- The teacher may provide handouts.
- Share the web link <https://www.youtube.com/watch?v=WvP0D0jiyLg> to learn how to crimp RJ45 cable.
- Let learners explore information on different types of network cable along with its color-coding of the cable and make note of it. Submit the notes on Google Classroom /social media.
- Let the learner solve SAMPLE SELF CHECK 1.7
- Provide additional questions.

D. Assessment:

Contact:

- Assess the learners while performing OPERATION SHEET 1.7 using the rubric.
- Assess the learner's responses on SAMPLE SELF CHECK 1.7.
- Assess the learner's answers posted on Google Classroom /social media.
- Conduct class tests.

Non-contact:

- Assess learners through their responses posted in Google Classroom /social media using the rubric.
- Assess the learner's responses on SAMPLE SELF CHECK 1.7.
- Assess the learner's answers posted on Google Classroom /social media.

E. Resources (online and offline):

- Competency-Based Learning Materials for Classes IX and X, REC
- Handouts
- <https://www.youtube.com/watch?v=WvP0D0jiyLg> (Explanation on crimping RJ45 cable).

A. Learning objectives/Broad theme/strand/chapter:

Learning Objective	Topic
1.2.1 List materials specifications for casing and capping 1.2.2 Explain the reason for casing & capping <i>1.2.3 Use drilling machine</i> <i>1.2.4 Ensure to use appropriate PPE</i> <i>1.2.5 Carryout casing and capping</i>	1.8 Carrying out casing and capping

B. Competencies:

- Carryout casing capping when a new network is set up or during the major maintenance of an existing network.

C. Pedagogy/Learning Experiences

Contact:

- Let the learners read INFORMATION SHEET 1.8
- Let the learners be in a group and explore information on the materials/tools required for carryout casing and capping. Present the information to the class.
- The teacher may demonstrate OPERATION SHEET 1.8
- Let the learners perform OPERATION SHEET 1.8
- Let the learner solve SAMPLE SELF CHECK 1.8

Non-contact:

- Let the learners read INFORMATION SHEET 1.8
- The teacher may provide handouts, self-made video tutorials, and ICT materials (PPT/PDF).
- Let the learner solve SAMPLE SELF CHECK 1.8

D. Assessment:

Contact:

- Assess the learner's base on the presentation using the rubrics.
- Assess the learners while performing OPERATION SHEET 1.8 using the rubric.
- Assess the learner's responses on SAMPLE SELF CHECK 1.8

Non-contact:

- Assess the learner's responses on SAMPLE SELF CHECK 1.8

E. Resources (online and offline):

- Competency-Based Learning Materials for Classes IX and X, REC
- Handouts
- <https://www.youtube.com/watch?v=WvP0D0jiyLg> (Explanation on crimping RJ45 cable).

Chapter 2: Configuring network

A. Learning objectives/Broad theme/strand/chapter:

Learning Objective	Topic
<p>2.1.1 Explain configuration of time zone</p> <p>2.1.2 List types of ISP connection</p> <p>2.1.3 State SSID and its use</p> <p>2.1.4 Explain the types of authentication</p> <p>2.1.5 Explain types of encryption</p> <p>2.1.6 State importance of security key</p> <p>2.1.7 Explain types and differences between modem router</p> <p>2.1.8 State function of a modem</p> <p>2.1.9 Describe LED light reading for:</p> <ul style="list-style-type: none">• LAN• WPS• ADSL• Power• Internet <p>2.1.10 <i>Ensure to select the strong security type</i></p> <p>2.1.11 <i>Configure modem router</i></p>	<p>Configuring modem router (Wireless Router)</p>

B. Competencies:

- Configure modem router (Wireless Router) when setting up new modem router and/or replacing a faulty router

C. Pedagogy/Learning Experiences

Contact:

- Let the learners read INFORMATION SHEET 2.1
- The teacher may demonstrate OPERATION SHEET 2.1
- Let the learners perform OPERATION SHEET 2.1
- Let the learner solve SAMPLE SELF CHECK 2.1

Non-contact:

- Let the learners read INFORMATION SHEET 2.1
- The teacher may provide handouts.
- Share the web link <https://www.youtube.com/watch?v=WYVVVZQCPvg> to learn how to set up a wireless router.
- Let learners explore information on different types of a router and the ways to configure the router. Make note of it.
- Let the learner solve SAMPLE SELF CHECK 2.1
- Provide additional questions.

D. Assessment:

Contact:

- Assess the learners while performing OPERATION SHEET 2.1 using the rubric.
- Assess the learner's response on SAMPLE SELF CHECK 2.1
- Conduct class test to assess learners conceptual understanding of configuring modem router (wireless router)

Non-contact:

- Assess the learner's response on SAMPLE SELF CHECK 2.1
- Assess learners through their answers posted in Google Classroom /social media using the rubric.

E. Resources (online and offline):

- Competency-Based Learning Materials for Classes IX and X, REC
- Handouts
- <https://www.youtube.com/watch?v=WYVVVZQCPvg> (Explanation on configuring modem router)

A. Learning objectives/Broad theme/strand/chapter:

Learning Objective	Topic
2.2.1 Explain the configuration of the IP address and its version 2.2.2 Differentiate DHCP and static IP address 2.2.3 <i>Ensure to select the correct option of static and dynamic IP address</i> 2.2.4 <i>Configure computer on the network</i>	2.2 Configuring computer on the network

B. Competencies:

- Configure a computer on the network when installing a new network

C. Pedagogy/Learning Experiences

Contact:

- Let the learners read INFORMATION SHEET 2.2
- The teacher may demonstrate OPERATION SHEET 2.2
- Let the learners perform OPERATION SHEET 2.2
- Let the learner solve SAMPLE SELF CHECK 2.2

Non-contact:

- Let the learners read INFORMATION SHEET 2.2
- The teacher may provide handouts.
- Share the web link <https://www.youtube.com/watch?v=e6-TaH5bkjo> to learn how to assign DHCP address.
- Let the learner solve SAMPLE SELF CHECK 2.2
- Provide additional questions.

D. Assessment:

Contact:

- Assess the learners while performing OPERATION SHEET 2.2 using the rubric.
- Assess the learner's responses on SAMPLE SELF CHECK 2.2
- Conduct class tests to assess learners' conceptual understanding of assigning IP addresses.

Non-contact:

- Assess learners through their responses posted in Google Classroom /social media using the rubric.
- Assess the learner's responses on SAMPLE SELF CHECK 2.2

E. Resources (online and offline):

- Competency-Based Learning Materials for Classes IX and X, REC
- Handouts
- <https://www.youtube.com/watch?v=e6-TaH5bkjo> (Explanation on assigning DHCP address)

A. Learning objectives/Broad theme/strand/chapter:

Learning Objective	Topic
2.3.1 Define gateway and subnet mask 2.3.2 Classify IP address sub-netting 2.3.3 Differentiate public and private IP address 2.3.4 State basic commands of DOS 2.3.5 List purpose of the command prompt 2.3.6 Explain network commands syntax 2.3.7 <i>Ensure to assign a different IP address to avoid IP conflict</i> 2.3.8 <i>Assign IP address</i>	2.3 Assigning Internet protocol (IP) address

B. Competencies:

- Assign IP address when setting up the network.

B. Pedagogy/Learning Experiences

Contact:

- Let the learners read INFORMATION SHEET 2.3
- Provide handouts.
- The teacher may demonstrate OPERATION SHEET 2.3
- Let the learners perform OPERATION SHEET 2.3
- Let the learner solve SAMPLE SELF CHECK 2.3

Non-contact:

- Let the learners read INFORMATION SHEET 2.3
- The teacher may provide handouts.
- Share the web link <https://www.youtube.com/watch?v=13-5pQP3gmc> to learn how to assign the IP address. Make note of it.

- Let the learner solve SAMPLE SELF CHECK 2.3
- Provide additional questions.

C. Assessment:

Contact:

- Assess the learners while performing OPERATION SHEET 2.3 using the rubric.
- Assess the learner's responses on SAMPLE SELF CHECK 2.3
- Conduct class tests to assess learner's conceptual understanding of assigning IP addresses.

Non-contact:

- Assess learners through their notes posted in Google Classroom /social media using the rubric.
- Assess the learner's responses on SAMPLE SELF CHECK 2.3
- Assess learners through their answers posted in Google Classroom /social media using the rubric.

D. Resources (online and offline):

- Competency-Based Learning Materials for Classes IX and X, REC
- Handouts
- <https://www.youtube.com/watch?v=13-5pQP3gmc> (Explanation on assigning IP address)

A. Learning objectives/Broad theme/strand/chapter:

Learning Objective	Topic
2.4.1 State functions and types of switches	2.4 Configuring switch
2.4.2 List specification of the switch	
2.4.3 List CLI commands	
2.4.4 purpose of configuring the switch	
2.4.5 <i>Install switch</i>	
2.4.6 <i>Ensure to plug cable with care</i>	
2.4.7 <i>Configure switch</i>	

B. Competencies:

- Configure switch when a new network is set up.

C. Pedagogy/Learning Experiences

Contact:

- Let the learners read INFORMATION SHEET 2.4
- Let learners be a group of 2 and assign a topic each in a group. Let them explore and present the information to the class.
- The teacher may demonstrate OPERATION SHEET 2.4
- Let the learners perform OPERATION SHEET 2.4
- Let the learner solve SAMPLE SELF CHECK 2.4

Non-contact:

- Let the learners read INFORMATION SHEET 2.4
- The teacher may provide handouts and self-made video tutorials.
- Share the web link <https://www.youtube.com/watch?v=ya9R7yn23F0> to learn to configure the switch. Let learners make note of the steps to configure the switch and submit it through Google Classroom.
- Let the learner solve SAMPLE SELF CHECK 2.4

D. Assessment:

Contact:

- Assess the learners while performing OPERATION SHEET 2.4 using the rubric.
- Assess the learner's responses on SAMPLE SELF CHECK 2.4
- Conduct class.

Non-contact:

- Assess learners through their notes posted in Google Classroom /social media using the rubric.
- Assess the learner's responses on SAMPLE SELF CHECK 2.4

E. Resources (online and offline):

- Competency-Based Learning Materials for Classes IX and X, REC
- Handouts
- <https://www.youtube.com/watch?v=ya9R7yn23F0> (explanation on configuring switch)

A. Learning objectives/Broad theme/strand/chapter:

Learning Objective	Topic
2.5.1 State the reasons for configuring the firewall 2.5.2 Explain the different settings available in windows firewall 2.5.3 List the types of network security software 2.5.4 <i>Ensure to select the strong security type</i> 2.5.5 <i>Configure network security software</i>	2.5 Configuring network security software

B. Competencies:

- Configure network security software when installing a new network

C. Pedagogy/Learning Experiences

Contact:

- Let the learners read INFORMATION SHEET 2.5
- The teacher may demonstrate OPERATION SHEET 2.5
- Let the learners perform OPERATION SHEET 2.5
- Let the learner solve SAMPLE SELF CHECK 2.5

Non-contact:

- Let the learners read INFORMATION SHEET 2.5
- The teacher may provide handouts.
- Share the web link <https://www.youtube.com/watch?v=rk0WcOT-Z2Y> to learn configuring network security software.
- Let learners explore information on a different type of network security software used in our computer. Make note of it and submit it through Google Classroom /social media
- Let the learner solve SAMPLE SELF CHECK 2.5

D. Assessment:

Contact:

- Assess the learners while performing OPERATION SHEET 2.5 using the rubric.
- Assess the learner's responses on SAMPLE SELF CHECK 2.5

- Conduct viva.
- Conduct class tests to assess their understanding of configuring network security software.

Non-contact:

- Assess learners through their notes posted in Google Classroom /social media using the rubric.
- Assess the learner’s responses on SAMPLE SELF CHECK 2.5

E. Resources (online and offline):

- Competency-Based Learning Materials for Classes IX and X, REC
- Handouts
- <https://www.youtube.com/watch?v=rk0WcOT-Z2Y> (Explanation on configuring network security software)

A. Learning objectives/Broad theme/strand/chapter:

Learning Objective	Topic
2.6.1. Explain the format of maintaining network details	2.6 Documenting network details
2.6.2. Draw a network diagram	
2.6.3. <i>Ensure safe handling of tools and materials</i>	
2.6.4. <i>document network details</i>	

B. Competencies:

- Document network details when a network is established.

C. Pedagogy/Learning Experiences

Contact:

- Let the learners read INFORMATION SHEET 2.6
- The teacher may demonstrate OPERATION SHEET 2.6
- Let the learners perform OPERATION SHEET 2.6
- Let the learner solve SAMPLE SELF CHECK 2.6

Non-contact:

- Let the learners read INFORMATION SHEET 2.6
- The teacher may provide handouts.
- Share the web link <https://www.lucidchart.com/blog/importance-of-network-documentation> to learn documenting network details. Let learners make note of it and submit it through Google Classroom social media.
- Let the learner solve SAMPLE SELF CHECK 2.6

D. Assessment:

Contact:

- Assess the learners while performing OPERATION SHEET 2.6.
- Assess the learner's responses on SAMPLE SELF CHECK 2.6

Non-contact:

- Assess learners through their notes posted in Google Classroom /social media using the rubric.
- Assess the learner's responses on SAMPLE SELF CHECK 2.6

E. Resources (online and offline):

- Competency-Based Learning Materials for Classes IX and X, REC
- Handouts
- <https://www.lucidchart.com/blog/importance-of-network-documentation> (Explanation on documenting network details.)

Chapter 3: Conducting a Test

A. Learning objectives/Broad theme/strand/chapter:

Learning Objective	Topic
3.1.1 Define network device driver 3.1.2 State the purpose of a network device driver 3.1.3 List alternative ways to obtain device driver 3.1.4 List error related to a network device driver 3.1.5 <i>Ensure to use the right device driver for the network card</i>	3.1 Checking network device driver

- **Competencies:**
- Check a network device driver when the network device is not functioning.

Pedagogy/Learning Experiences

Contact:

- Let the learners read INFORMATION SHEET 3.1
- The teacher may demonstrate OPERATION SHEET 3.1
- Let the learners perform OPERATION SHEET 3.1
- Let the learner solve SAMPLE SELF CHECK 3.1
- Provide additional questions.

Non-contact:

- Let the learners read INFORMATION SHEET 3.1
- The teacher may provide handouts and self-made video tutorials.
- Share the web link <https://www.youtube.com/watch?v=sLuGaCKGLWA> to learn how to check network device manager
- Let the learner solve SAMPLE SELF CHECK 3.1

Assessment:

Contact:

- Assess learners while performing OPERATION SHEET 3.1 using the rubric.
- Assess the learner’s responses on SAMPLE SELF CHECK 3.1.
- Assess the learner’s answers posted on Google Classroom /social media using the rubric.
- Conduct tests to check their knowledge on checking network device drivers.

Non-contact:

- Assess the learner’s responses on SAMPLE SELF CHECK 3.1.
- Assess the learner’s answers posted on Google Classroom /social media using the rubric.
- Conduct online class tests using Google Classroom/social media.

Resources (online and offline):

- Competency-Based Learning Materials for Classes IX and X, REC
- Handouts
- <https://www.youtube.com/watch?v=sLuGaCKGLWA> (Explanation on checking network device driver.)

A. Learning objectives/Broad theme/strand/chapter:

Learning Objective	Topic
3.3.1 List ways to test network connectivity 3.3.2 List types of Ethernet cable 3.3.3 List different types of faults. 3.3.4 Identify faulty cables through LED blinking 3.3.5 Explain the error message “Limited or no Connectivity” 3.3.6 <i>Ensure proper handling of tool and equipment</i> 3.3.7 <i>Test cable connectivity</i>	3.2 Testing cable connectivity

B. Competencies:

- Test cable continuity while new UTP cable is prepared or the cable is repaired

C. Pedagogy/Learning Experiences**Contact:**

- Let the learners read INFORMATION SHEET 3.2
- The teacher may demonstrate OPERATION SHEET 3.2
- Let the learners perform OPERATION SHEET 3.2
- Let the learner solve SAMPLE SELF CHECK 3.2
- Provide additional questions.

Non-contact:

- Let the learners read INFORMATION SHEET 3.2
- Share a web link <https://www.youtube.com/watch?v=y3DmOPrmBio> or other relevant resources that explains testing cable continuity. The learners will watch the video and write notes on how it is done.
- Let learners explore information on other ways to test cable continuity and make note of it.
- Let the learner solve SAMPLE SELF CHECK 3.2

D. Assessment:**Contact:**

- Assess learners while performing OPERATION SHEET 3.2 using the rubric.
- Provide necessary intervention based on the rating the learners receive.
- Assess the learner's responses on SAMPLE SELF CHECK 3.2.
- Assess learners base on the answers submitted in Google Classroom/social media.

Non-contact:

- Assess the learner's responses on SAMPLE SELF CHECK 3.2.
- Assess learners base on the answers submitted in Google Classroom/social media.
- Conduct online quizzes through google classroom.

E. Resources (online and offline):

- Competency-Based Learning Materials for Classes IX and X, REC
- Handouts
- <https://www.youtube.com/watch?v=y3DmOPrmBio> (Explanation on testing continuity of a cable)

A. Learning objectives/Broad theme/strand/chapter:

Learning Objective	Topic
3.3.1 Define ping command in networking 3.3.2 State the purpose of the ping command 3.3.3 Explain the ping command 3.3.4 State the different types of network command and function 3.3.5 <i>Ensure safe handling of tools and equipment</i> 3.3.6 <i>Ping IP address</i>	3.3 Pinging IP address

B. Competencies:

- Ping IP address when devices fail to respond.

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C. Pedagogy/Learning Experiences

Contact:

- Let the learners read INFORMATION SHEET 3.3
- Let learners explore information on other ways to ping IP address one another computer
- The teacher may demonstrate OPERATION SHEET 3.3
- Let the learners perform OPERATION SHEET 3.3
- Let the learner solve SAMPLE SELF CHECK 3.3
- Provide additional questions.

Non-contact:

- Let the learners read INFORMATION SHEET 3.3
- Share the web link <https://www.youtube.com/watch?v=nh8LQBMoC7I> or other relevant resources to explain pinging IP address. The learners will watch the video and write notes on how it is done.
- Let learners explore information on common network commands and make note of it. Submit the note through Google Classroom/social media.
- Let the learner solve SAMPLE SELF CHECK 3.3.
- Provide additional questions.

D. Assessment:

Contact:

- Assess learners while performing OPERATION SHEET 3.3 using the rubric.
- Provide necessary intervention based on the rating the learners receive.
- Assess the learner’s responses on SAMPLE SELF CHECK 3.3.
- Assess learners base on the answers submitted in Google Classroom/social media.
- Conduct class tests to assess their knowledge.

Non-contact:

- Assess learner's conceptual understanding on pinging IP address through the notes submitted in google classroom/social media.
- Assess the learner’s responses on SAMPLE SELF CHECK 3.3.
- Assess learners base on the answers submitted in Google Classroom/social media.

E. Resources (online and offline):

- Competency-Based Learning Materials for Classes IX and X, REC
- Handouts
- <https://www.youtube.com/watch?v=nh8LQBMoC7I> (Explanation on ping IP address)

MODULE 4: PERFORMING MAINTENANCE OF NETWORK

Chapter 1: Diagnosing Network Faults

A. Learning objectives/Broad theme/strand/chapter:

Learning objectives	Topic
1.1.1 Define data transmission 1.1.2 List data transmission rate 1.1.3 List ways to check internet bandwidth 1.1.4 Ensure safe handling of materials and equipment	1.1 Checking data transmission

B. Competencies:

- Check data transmission when setting up a new network or inspecting the data rate of the existing network.

C. Pedagogy/Learning Experiences

Contact:

- Let the learners read INFORMATION SHEET 1.1.
- Provide handout.
- Share the web link <https://www.youtube.com/watch?v=4rCdCKAx1D0> to learn different types of data transmission.
- The teacher may demonstrate OPERATION SHEET 1.1
- Let the learners perform OPERATION SHEET 1.1
- Let the learner solve SAMPLE SELF CHECK 1.1

Non-contact:

- Let the learners read INFORMATION SHEET 1.1.
- Teacher may provide handouts and self-made video tutorials to learners through Google Classroom or any other social media platforms.
- Share the web link <https://www.youtube.com/watch?v=4rCdCKAx1D0> to learn about different types of data transmission modes and make note of it.
- Let the learner solve SAMPLE SELF CHECK 1.1

D. Assessment:

Contact:

- Assess learners while performing OPERATION SHEET 1.1 using the rubric.
- Provide necessary intervention based on the rating the learners receive.
- Assess the learner's responses on SAMPLE SELF CHECK 1.1.
- Conduct class tests to assess their knowledge.

Non-contact:

- Assess the learner's responses on SAMPLE SELF CHECK 1.1.
- Assess learners base on the notes submitted in Google Classroom/social media.

E. Resources (online and offline):

- Competency-Based Learning Materials for Classes IX and X, REC
- Handouts
- <https://www.youtube.com/watch?v=4rCdCKAx1D0> (Explanation on checking data transmission)

A. Learning objectives/Broad theme/strand/chapter:

Learning objectives	Topic
1.2.1 Define network strength 1.2.2 List different ways to check network signal strength 1.2.3 State purpose of checking network signal strength. 1.2.4 <i>Ensure safe handling of tools and equipment</i>	1.2 Checking signal strength

B. Competencies:

- Check signal strength when the performance of the network is not stable.

C. Pedagogy/Learning Experiences

Contact:

- Let the learner's read INFORMATION SHEET 1.2
- Share the web link <https://www.youtube.com/watch?v=eXQRIAlzW9o> to learn different types of data transmission.
- Let learners be in a group and assign each topic to different ways to check network signal strength. Let them explore the information and present it to the class.
- The teacher may demonstrate OPERATION SHEET 1.2.
- Let the learners perform OPERATION SHEET 1.2.
- Let the learner solve SAMPLE SELF CHECK 1.2.
- Provide questions.

Non-contact:

- Let the learner's read INFORMATION SHEET 1.2
- The teacher may provide handouts
- Share the web link <https://www.youtube.com/watch?v=eXQRIAlzW9o> to learn how to check the available network signal strength.
- Let learners explore information on different ways to check the network signal strength and make an operation sheet and make note of it.
- Let the learners perform OPERATION SHEET 1.2
- Provide questions.

D. Assessment:

Contact:

- Assess learners base on the presentation using the rubric.
- Assess learners while performing OPERATION SHEET 1.2 using the rubric.
- Assess the learner’s responses on SAMPLE SELF CHECK 1.2.
- Assess the learner’s answers posted on google classroom/social media.
- Conduction of class test to assess learner's conceptual understanding on checking network signal strength.

Non-contact:

- Assess learners base on the notes submitted in Google Classroom/social media.
- Assess the learner’s responses on SAMPLE SELF CHECK 1.2.
- Assess learners base on the answers submitted in Google Classroom/social media.

E. Resources (online and offline):

- Competency-Based Learning Materials for Classes IX and X, REC
- Handouts
- <https://www.youtube.com/watch?v=eXQRIAlzW9o> (Explanation on checking any available network signal strength)

A. Learning objectives/Broad theme/strand/chapter:

Learning objectives	Topic
1.3.1 Explain the purpose of port 1.3.2 State the application of telnet connectivity TCP (Transmission Control Protocol) port	1.3 Test Device port

B. Competencies:

- Test device port when ports are damaged and/or non-functional.

C. Pedagogy/Learning Experiences

Contact:

- Let the learners read INFORMATION SHEET 1.3.
- The teacher may demonstrate OPERATION SHEET 1.3.

- Let the learners perform OPERATION SHEET 1.3.

- Let the learner solve SAMPLE SELF CHECK 1.3.

Non-contact:

- Let the learners read INFORMATION SHEET 1.3.
- The teacher may provide handouts and a self-made video tutorial.
- Let the learner solve SAMPLE SELF CHECK 1.3.
- Provide additional questions.

D. Assessment:

Contact:

- Assess learners while performing OPERATION SHEET 1.3 using the rubric.
- Assess the learner’s responses on SAMPLE SELF CHECK 1.3.
- Conduct class tests to assess learner's conceptual understanding of testing device port.

Non-contact:

- Assess the learner’s responses on SAMPLE SELF CHECK 1.3.
- Assess the learner’s answers posted on Google Classroom/social media.

E. Resources (online and offline):

- Competency-Based Learning Materials for Classes IX and X, REC
- Handouts.

Chapter 2: Carrying out maintenance

A. Learning objectives/Broad theme/strand/chapter:

Learning objectives	Topic
2.1.1 Define a preventive maintenance plan 2.1.2 State the importance of a checklist 2.1.3 State the importance of network maintenance plan 2.1.4 State the factors to be considered before maintaining the network 2.1.5 <i>Ensure to keep the checklist in a safe place</i> 2.1.6 <i>Prepare maintenance plan</i>	2.1 Prepare maintenance plan

B. Competencies:

- Prepare maintenance plan when setting up a new network and additional software and hardware is added to the network system.

C. Pedagogy/Learning Experiences**Contact:**

- Let the learners read INFORMATION SHEET 2.1.
- Let the learner be in a group and let them prepare a maintenance plan for the school administrative block. Let them present in the class.
- The teacher may demonstrate OPERATION SHEET 2.1.
- Let the learners perform OPERATION SHEET 2.1.
- Let the learner solve SAMPLE SELF CHECK 2.1.

Non-contact:

- Let the learners read INFORMATION SHEET 2.1.
- The teacher may provide handouts and a self-made video tutorial.
- Let the learner solve SAMPLE SELF CHECK 2.1.
- Provide additional questions.

D. Assessment:**Contact:**

- Assess learners while performing OPERATION SHEET 2.1 using the rubric.
- Assess learner's conceptual understanding on preparing maintenance plan through the presentation.
- Assess the learner's responses on SAMPLE SELF CHECK 2.1.
- Conduct class test

Non-contact:

- Assess the learner's responses on SAMPLE SELF CHECK 2.1.
- Assess the learner's answers posted on Google Classroom/social media.

E. Resources (online and offline):

- Competency-Based Learning Materials for Classes IX and X, REC
- Handouts

A. Learning objectives/Broad theme/strand/chapter:

Learning objectives	Topic
2.2.1 State the importance of backup network data 2.2.2 List types of software to backup data 2.2.3 State the importance of maintaining maintenance records 2.2.4 <i>Ensure to use appropriate backup software</i> 2.2.5 <i>Back up network data</i>	2.2 Backing up network data

B. Competencies:

- Backup Network data when solving network issues and before upgrading server.

C. Pedagogy/Learning Experiences

Contact:

- Let the learners read INFORMATION SHEET 2.2.
- Provide handouts.
- Let learners explore different types of software used to back up data and make note of it.
- Share the web link <https://www.youtube.com/watch?v=62spy1NJohE> to learn backing up data.
- The teacher may demonstrate OPERATION SHEET 2.2.
- Let the learners perform OPERATION SHEET 2.2.
- Let the learner solve SAMPLE SELF CHECK 2.2.

Non-contact:

- Let the learners read INFORMATION SHEET 2.2.
- The teacher may provide handouts.
- Let learners explore different types of software used to back up data and submit it through Google Classroom.
- Share the web link <https://www.youtube.com/watch?v=62spy1NJohE> to learn backing up data.
- Let the learner solve SAMPLE SELF CHECK 2.2.
- Provide additional questions.

D. Assessment:**Contact:**

- Assess learners while performing OPERATION SHEET 2.2 using the rubric.
- Assess the learner's responses on SAMPLE SELF CHECK 2.2.
- Conduct class test

Non-contact:

- Assess the learner's responses on SAMPLE SELF CHECK 2.2.
- Assess the learner's answers posted on google classroom/social media.

E. Resources (online and offline):

- Competency-Based Learning Materials for Classes IX and X, REC
- Handouts
- <https://www.youtube.com/watch?v=62spy1NJohE> (Explanation on backing up data)

A. Learning objectives/Broad theme/strand/chapter:

Learning objectives	Topic
2.3.1 Define network software	2.3 Upgrading network software
2.3.2 State function of Network Operating System (NOS)	
2.3.3 State purpose of upgrading	
2.3.4 List network software (Operating System)	
2.3.5 List ways to upgrade a network operating system	
2.3.6 Differentiate Network OS(NOS) and desktop OS	
2.3.7 <i>Be patient while upgrading network software</i>	

B. Competencies:

- Upgrade network operating software when upgrade popup message is displayed or when the existing software becomes obsolete.

C. Pedagogy/Learning Experiences**Contact:**

- Let the learners read INFORMATION SHEET 2.3.
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- The teacher may demonstrate OPERATION SHEET 2.3.
- Let the learners perform OPERATION SHEET 2.3.
- Let the learner solve SAMPLE SELF CHECK 2.3.

Non-contact:

- Let the learners read INFORMATION SHEET 2.3.
- The teacher may provide handouts.
- Share the web link <https://www.youtube.com/watch?v=V3sfimpcnw> to learn to upgrade NOS.
- Let the learner solve SAMPLE SELF CHECK 2.3.
- Provide additional questions.

D. Assessment:

Contact:

- Assess learners while performing OPERATION SHEET 2.3 using the rubric.
- Assess the learner’s responses on SAMPLE SELF CHECK 2.3.
- Conduct viva.

Non-contact:

- Assess the learner’s responses on SAMPLE SELF CHECK 2.3.

E. Resources (online and offline):

- Competency-Based Learning Materials for Classes IX and X, REC
- Handouts
- <https://www.youtube.com/watch?v=V3sfimpcnw> (Explanation on upgrading NOS)

A. Learning objectives/Broad theme/strand/chapter:

Learning objectives	Topic
2.2.1 Define network security software 2.2.2 Explain network security 2.2.3 List types of network security software 2.2.4 List importance of network security software 2.2.5 List some free wireless security tools 2.2.6 <i>Ensure network security software is up-to-date</i> 2.2.7 <i>Upgrade network security software</i>	2.4 Upgrading network security software

B. Competencies:

- Upgrade network security software when new firmware/software is released.

C. Pedagogy/Learning Experiences**Contact:**

- Let the learners read INFORMATION SHEET 2.4.
- The teacher may demonstrate OPERATION SHEET 2.4.
- Let the learners perform OPERATION SHEET 2.4.
- Let the learner solve SAMPLE SELF CHECK 2.4.

Non-contact:

- Let the learners read INFORMATION SHEET 2.4.
- Teacher may provide handouts.
- Let learners read information sheet 2.4
- Share the web link <https://www.youtube.com/watch?v=UCTScXvQIGM> to learn to upgrade network security software and let learners make note of it. Submit notes through Google Classroom/social media.
- Let the learner solve SAMPLE SELF CHECK 2.4.

D. Assessment:**Contact:**

- Assess learners while performing OPERATION SHEET 2.4 using the rubric.
- Assess the learner's responses on SAMPLE SELF CHECK 2.4.
- Conduct class tests.

Non-contact:

- Assess the learner's understanding base on the note submitted in google classroom/social media.
- Assess the learner's responses on SAMPLE SELF CHECK 2.4.

E. Resources (online and offline):

- Competency-Based Learning Materials for Classes IX and X, REC
- Handouts
- <https://www.youtube.com/watch?v=UCTScXvQIGM> (Explanation on upgrading network security software)

A. Learning objectives/Broad theme/strand/chapter:

Learning objectives	Topic
2.5.1 Explain the causes of signal fluctuations 2.5.2 Explain the method of rectifying the WIFI signal 2.5.3 Explain the method to check signal strength 2.5.4 <i>Ensure to keep the wireless router in a proper location in coverage of network signal</i>	2.5 Rectify signal strength

B. Competencies:

- Rectify signal (WiFi) strength when an internet connection is weak/fluctuates.

C. Pedagogy/Learning Experiences

Contact:

- Let the learners read INFORMATION SHEET 2.5.
- The teacher may demonstrate OPERATION SHEET 2.5.
- Let the learners perform OPERATION SHEET 2.5.
- Let the learner solve SAMPLE SELF CHECK 2.5.

Non-contact:

- Let the learners read INFORMATION SHEET 2.5.
- Teacher may provide handouts.
- Share the web link <https://www.youtube.com/watch?v=6KUxkZnEt1M> to learn to rectify the WIFI signal. Make note of it.
- Let the learner solve SAMPLE SELF CHECK 2.5.

D. Assessment:

Contact:

- Assess learners while performing OPERATION SHEET 2.5 using the rubric.
- Assess the learner's responses on SAMPLE SELF CHECK 2.5.
- Conduct class tests.

Non-contact:

- Assess the learner's understanding base on the note submitted in Google Classroom/social media.

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- Assess the learner’s responses on SAMPLE SELF CHECK 2.5.

E. Resources (online and offline):

- Competency-Based Learning Materials for Classes IX and X, REC
- Handouts
- <https://www.youtube.com/watch?v=UCTScXvQIGM> (Explanation on rectifying WIFI strength)

A. Learning objectives/Broad theme/strand/chapter:

Learning objectives	Topic
2.2.1 Define Wi-Fi protect setup (WPS) 2.2.2 State the purpose of resetting modem router 2.2.3 Differentiate between hard and soft reset 2.2.4 List default IP address of TP-link and D-Link router 2.2.5 <i>Ensure to press the reset button with the required force.</i>	2.6 Reset modem router

B. Competencies:

- Reset modem router when an administrator password is forgotten and WiFi performance is poor.

C. Pedagogy/Learning Experiences

Contact:

- Let the learners read INFORMATION SHEET 2.6.
- The teacher may demonstrate OPERATION SHEET 2.6.
- Let the learners perform OPERATION SHEET 2.6.
- Let the learner solve SAMPLE SELF CHECK 2.6.

Non-contact:

- Let the learners read INFORMATION SHEET 2.6.
- The teacher may provide handouts.
- Share the web link <https://www.youtube.com/watch?v=e9CEk08Hac4> to learn resetting modem router. Make note of steps and submit it in google classroom.
- Let the learner solve SAMPLE SELF CHECK 2.6.

D. Assessment:

Contact:

- Assess learners while performing OPERATION SHEET 2.6 using the rubric.
- Assess the learner's responses on SAMPLE SELF CHECK 2.6.

Non-contact:

- Assess the learner's understanding base on the note submitted in Google Classroom/social media.
- Assess the learner's responses on SAMPLE SELF CHECK 2.6.

E. Resources (online and offline):

- Competency-Based Learning Materials for Classes IX and X, REC
- Handouts
- <https://www.youtube.com/watch?v=e9CEk08Hac4> (Explanation on resetting modem router)

A. Learning objectives/Broad theme/strand/chapter:

Learning objectives	Topic
2.2.1 State the importance of recording maintenance activities 2.2.2 Explain the challenges faced by the network administrator 2.2.3 <i>Be patient while preparing a maintenance report</i>	2.7 Prepare maintenance report

B. Competencies:

- Prepare maintenance report when administering and managing network

C. Pedagogy/Learning Experiences

Contact:

- Let the learners read INFORMATION SHEET 2.7.
- The teacher may demonstrate OPERATION SHEET 2.7.
- Let the learners perform OPERATION SHEET 2.7.
- Let the learner solve SAMPLE SELF CHECK 2.7.

Non-contact:

- Let the learners read INFORMATION SHEET 2.7.
- The teacher may provide handouts.

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- Let the learner solve SAMPLE SELF CHECK 2.7.
 - Provide additional questions.

D. Assessment:

Contact:

- Assess learners while performing OPERATION SHEET 2.7 using the rubric.
- Assess the learner's responses on SAMPLE SELF CHECK 2.7.
- Assess learners through the conduction of class test

Non-contact:

- Assess the learner's responses on SAMPLE SELF CHECK 2.7.
- Assess the learner's answers posted on Google Classroom/social media.

E. Resources (online and offline):

- Competency Based Learning Materials for Classes IX and X, REC
- Handouts

RESOURCES

- 1) Technical and Vocational Education and Training (TVET) New Normal Curriculum Framework.
- 2) Curriculum-Based Learning Material (Computer Hardware and Networking)