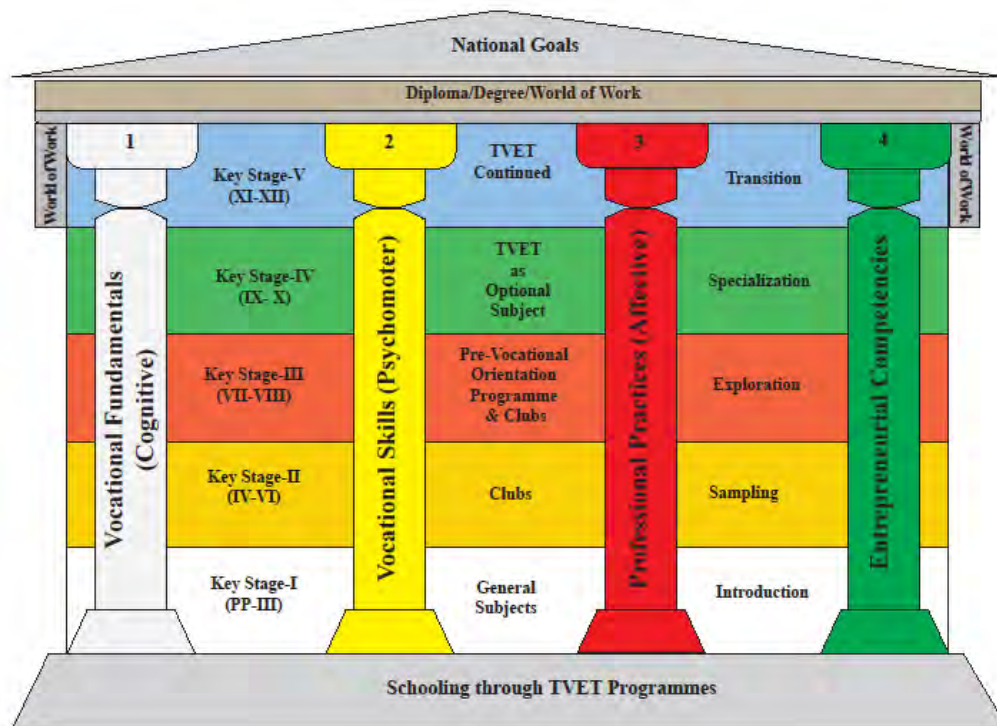


TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING (TVET) NEW NORMAL CURRICULUM INSTRUCTIONAL GUIDE (COMPUTER HARDWARE AND NETWORKING)

CLASS: IX



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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 Rinchening) 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 1: PERFORMING INSTALLATION AND CONFIGURATION OF COMPUTER SYSTEM AND DEVICE

Chapter 1: Applying Occupational Health and Safety (OHS)

A. Learning objectives/Broad theme/Strand/Chapter:

Learning objectives	Core concepts (Chapters/Topics)
1.1.1 Define 5S. 1.1.2 State the purposes of 5S 1.1.3 Explain the principle of 5S 1.1.4 Define OHS 1.1.5 State the importance of OHS. 1.1.6 Explain the rights of the employee 1.1.7 State the main causes of accidents 1.1.8 State the safety rules. 1.1.9 Ensure appropriate use of PPE. 1.1.10 Ensure to refer OHS manual 1.1.11 Apply the principles of 5Ss	1.1 Applying the principles of 5S

B. Competencies:

- Practice OHS procedures in any task for safety.

C. Pedagogy/Learning Experiences

Contact:

- Make learners read INFORMATION SHEET 1.1
- Provide handouts to learners.
- Share web link <https://youtu.be/n9sxq34D9HQ> to the learners which explains the principle of 5S.
- Make learners perform OPERATION SHEET 1.1
- Let the learners discuss in a group and do a presentation on 5S using PPT, handouts, demonstration, and short video clips to explain 5S.

Non-contact:

- Instruct learners to read INFORMATION SHEET 1.1 through Google Classroom.
- Share web link <https://youtu.be/n9sxq34D9HQ> that explains the principle of 5S.
- Provide handouts, self-made tutorial video clips, and PPT through Google Classroom or any other relevant social media.
- Instruct learners to perform OPERATION SHEET 1.1 through Google Classroom. (The learners may arrange available tools and materials at home)
- Let the learners discuss in the group the principle of 5s and submit their response through google classroom or any other relevant social media.

D. Assessment:

Contact:

- Make learners read INFORMATION SHEET 1.1 and perform OPERATION SHEET 1.1 and assess them using a checklist/performance guide. Provide necessary intervention.
- Assess learner's knowledge about 5S by asking questions.
- Conduct class tests to assess their understanding.
- Let learners carry out activities of the SAMPLE SELF CHECK 1.1
- Let the learners do the presentation and assess as per the rubric developed.

Non-contact:

- Make learners read INFORMATION SHEET 1.1 and perform OPERATION SHEET 1.1 and ask them to send the short video as evidence through Google Classroom or any other relevant social media platforms. assess them using a checklist/performance guide.
- Let the student solve SAMPLE SELF CHECK 1.1 and submit answers through google classroom or any other relevant social media.
- Give additional relevant questions from another resources-Text book/Google/YouTube and let learners submit answers through Google Classroom or any other social media platforms. Use the rubric to assess their answer.

E. Resources (online and offline):

- Competency-Based Learning Materials for Classes IX, REC
- Handouts
- <https://youtu.be/n9sxq34D9HQ> (Explanation on principles of 5S)

A. Learning objectives/Broad theme/Strand/Chapter:

Learning objectives	Core concepts (Chapters/Topics)
1.2.1 Define PPE. 1.2.2 State the importance of PPE. 1.2.3 List the categories of PPE. 1.2.4 Ensure to use appropriate PPE. 1.2.5 Ensure safe disposal of damaged PPE. 1.2.6 Ensure not to use defective and damaged PPE. 1.2.7 Use PPE	1.2 Using PPE

B. Competencies:

- Practice OHS procedures for safety.
- Make appropriate use of PPE.

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

- Make learners read INFORMATION SHEET 1.2
- Provide handouts to learners.
- Let learners explore PPE, through the web links <https://youtu.be/r9vp1q1L2ro> , <https://www.youtube.com/watch?v=DMBrRNV9Hrk> .
- Make learners perform OPERATION SHEET 1.2
- Let the learners discuss in a group and do a presentation on PPE using PPT, handouts, demonstration, and short video clips to explain PPE.

Non-contact:

- Instruct learners to read INFORMATION SHEET 1.2 through Google Classroom.
- Share the web link <https://youtu.be/r9vp1q1L2ro> ,
<https://www.youtube.com/watch?v=DMBrRNV9Hr> to the learners which explain PPE.
- Provide handouts, self-made tutorial video clips, and PPT through Google Classroom or any other relevant social media.
- Instruct learners to perform OPERATION SHEET 1.2 through Google Classroom.
- Let the learners discuss in the group about using PPE and submit their response through google classroom or any other relevant social media.

D. Assessment:**Contact:**

- Make learners read INFORMATION SHEET 1.2 and perform OPERATION SHEET 1.2 and assess them using a checklist/performance guide. Provide necessary intervention.
- Assess learner's knowledge about PPE by asking questions.
- Conduct class tests to assess their understanding.
- Let learners carry out activities of the SAMPLE SELF CHECK 1.2
- Let the learners do the presentation and assess as per the rubric developed.

Non-contact:

- Make learners read INFORMATION SHEET 1.2 and perform OPERATION SHEET 1.2 and ask them to send the short video as evidence through Google Classroom or any other relevant social media platforms. assess them using a checklist/performance guide.
- Let the student solve SAMPLE SELF CHECK 1.2 and submit answers through google classroom or any other relevant social media.
- Give additional relevant questions from other resources-Text books/Google/YouTube and let learners submit answers through Google Classroom or any other social media platforms. Use the rubric to assess their answer.

E. Resources (online and offline):

- Competency-Based Learning Materials for class IX.
- <https://www.youtube.com/watch?v=DMBRNV9Hr> (Explanation on PPE)
- <https://youtu.be/r9vp1q1L2ro> (Explanation on PPE)

A. Learning objectives/Broad theme/Strand/Chapter:

Learning objectives	Core concepts (Chapters/Topics)
1.3.1 Define safety precaution. 1.3.2 List different types of safety. 1.3.3 Explain workshop and personal safety. 1.3.4 State the importance of maintaining workplace and personal safety. 1.3.5 Explain the importance of safety signs and symbols. 1.3.6 Explain the emergency exit. 1.3.7 Describe the layout of the workshop. 1.3.8 Ensure to follow OHS procedures. 1.3.9 Ensure to keep the workshop clean. 1.3.10 Ensure to ring the alarm bell before the accident spreads over. 1.3.11 Ensure to display safety signs and symbols. 1.3.12 Ensure to use appropriate PPE in workplace. 1.3.13 Ensure to avoid horseplay at work place. 1.3.14 Ensure to avoid smoking and eating inside the workshop. 1.3.15 Ensure to avoid working under influence of alcohol. 1.3.16 Maintain workplace safety and personal safety.	1.3 Maintaining work place safety and personal safety.

B. Competencies:

- Practice OHS procedures in any task for safety
- Maintain workplace safety in day-to-day life.

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

- Make learners read INFORMATION SHEET 1.3
- Provide handouts to learners.
- Share the weblinks <https://www.youtube.com/watch?v=4bkr5lpKGUM> and <https://www.youtube.com/watch?v=WW0U6o1XNec> to learners which explain the importance of maintaining a workplace and personal safety.
- Make learners perform OPERATION SHEET 1.3
- Let the learners discuss in a group and do a presentation on maintaining a workplace and personal safety using PPT, handouts, demonstration, and short video clips to explain maintaining of the workplace and personal safety.

Non-contact:

- Instruct learners to read INFORMATION SHEET 1.3 through Google Classroom.
- Share the web links <https://www.youtube.com/watch?v=4bkr5lpKGUM> and <https://www.youtube.com/watch?v=WW0U6o1XNec> to the learners which explain the importance of maintaining a workplace and personal safety.
- Provide handouts, self-made tutorial video clips, and PPT through Google Classroom or any other relevant social media.
- Instruct learners to perform OPERATION SHEET 1.3 through Google Classroom.
- Let the learners discuss in a group and submit their responses through google classroom or any other relevant social media.

D. Assessment:**Contact:**

- Make learners read INFORMATION SHEET 1.3 and perform OPERATION SHEET 1.3 and assess them using a checklist/performance guide. Provide necessary intervention.
- Assess learner's knowledge about maintaining a workplace and personal safety by asking questions.
- Conduct class tests to assess their understanding.
- Let learners carry out activities of the SAMPLE SELF CHECK 1.3
- Let the learners do the presentation and assess as per the rubric developed.

Non-contact:

- Make learners read INFORMATION SHEET 1.3 and perform OPERATION SHEET 1.3 and ask them to send the short video as evidence through Google Classroom or any other relevant social media platforms. assess them using a checklist/performance guide.
- Let the student solve SAMPLE SELF CHECK 1.3 and submit the answer through google classroom or any other relevant social media.
- Give additional relevant questions from other resources-Text books/Google/YouTube and let learners submit answers through Google Classroom or any other social media platforms. Use the rubric to assess their answer.

E. Resources (online and offline:

- CBLM of Classes IX and X, REC
- <https://www.youtube.com/watch?v=WW0U6o1XNec> and <https://www.youtube.com/watch?v=4bkr5lpKGUM> (Explanation on workplace and personal safety)

A. Learning objectives/Broad theme/Strand/Chapter:

Learning objectives	Core concepts (Chapters/Topics)
1.4.1 Explain tools and equipment safety. 1.4.2 State the importance of maintaining tools and equipment safety. 1.4.3 List do's and don'ts of tools and equipment. 1.4.4 Ensure all the tools are in workable condition 1.4.5 Ensure to keep tools clean and dry, and store them properly after use. 1.4.6 Ensure to operate the machine when instructed. 1.4.7 Ensure to refer manual prior to operation of tools and equipment 1.4.8 Maintain tools and equipment safety.	1.4 Maintaining tools and equipment safety

B. Competencies:

- Practice OHS procedures in any task for safety
- Maintain hand tools and portable power tools for better performance

C. Pedagogy/Learning Experiences

Contact:

- Make learners read INFORMATION SHEET 1.4
 - Provide handouts to learners.
 - Share weblinks <https://www.bramptonguardian.com> or <http://www.ehsdb.com/dos-and-donts--hand-tools-equipments.php> to the learners which explain the importance of maintaining tools and equipment safety.
 - Make learners perform OPERATION SHEET 1.4
-

-
- Let the learners discuss in a group and do a presentation on Maintaining tools and equipment safety using PPT, handouts, demonstration, and short video clips to explain Maintaining tools and equipment safety.

Non-contact:

- Instruct learners to read INFORMATION SHEET 1.4 through Google Classroom.
- Share the web links <https://www.bramptonguardian.com> or <http://www.ehsdb.com/dos-and-donts--hand-tools-equipments.php> to the learners which explain about the Maintain tools and equipment safety.
- Provide handouts, self-made tutorial video clips, and PPT through Google Classroom or any other relevant social media.
- Instruct learners to perform OPERATION SHEET 1.4 through Google Classroom. (The learners may arrange available tools and materials at home)
- Let the learners discuss in a group and submit their responses through google classroom or any other relevant social media.

D. Assessment:

Contact:

- Make learners read INFORMATION SHEET 1.4 and perform OPERATION SHEET 1.4 and assess them using a checklist/performance guide. Provide necessary intervention.
- Assess learner's knowledge about maintaining tools and equipment safety by asking questions.
- Conduct class tests to assess their understanding.
- Let learners carry out activities of the SAMPLE SELF CHECK 1.4
- Let the learners do a presentation on maintaining tools and equipment safety and assess as per the rubric developed.

Non-contact:

- Make learners read INFORMATION SHEET 1.4 and perform OPERATION SHEET 1.4 and ask them to send the short video as evidence through Google Classroom or any other relevant social media platforms. assess them using a checklist/performance guide.
- Let the student solve SAMPLE SELF CHECK 1.4 and submit the answer through google classroom or any other relevant social media.
- Give additional relevant questions from other resources-Text books/Google/YouTube and let learners submit answers through Google Classroom or any other social media platforms. Use the rubric to assess their answer.

E. Resources (online and offline):

- Competency-Based Learning Materials for Classes IX, REC
- <https://www.bramptonguardian.com> or <http://www.ehsdb.com/dos-and-donts--hand-tools-equipments.php> (Explanation on maintaining tool and equipment safety)

A. Learning objectives/Broad theme/Strand/Chapter:

Learning objectives	Core concepts (Chapters/Topics)
1.5.1 Define fire extinguisher. 1.5.2 Label the parts of fire extinguisher. 1.5.3 Explain the types of fire. 1.5.4 List types of fire extinguishers. 1.5.5 State the method of combating/extinguishing fire. 1.5.6 Ensure to read the instructions provided on the fire extinguisher. 1.5.7 Ensure appropriate use PPE. 1.5.8 Use fire extinguisher	1.5 Using fire extinguisher

B. Competencies:

- Practice OHS procedures in any task for safety
- Use different types of fire extinguishers to combat the fire.

C. Pedagogy/Learning Experiences

Contact

- Make learners read INFORMATION SHEET 1.5
- Provide handouts to learners.
- Share the web link <https://www.youtube.com/watch?v=PQV71INDaqY> to the learner which explains the usage of fire extinguisher.
- Make learners perform OPERATION SHEET 1.5
- Let the learners discuss in a group and do a presentation on how to use fire extinguisher using PPT, handouts, demonstration, and short video clips to explain the usage of fire extinguishers.

Non-contact:

- Instruct learners to read INFORMATION SHEET 1.5 through Google Classroom.
- Share the web link <https://www.youtube.com/watch?v=PQV71INDaqY> to the learner which explains about the usage of fire extinguisher.
- Provide handouts, self-made tutorial video clips, and PPT through Google Classroom or any other relevant social media.
- Instruct learners to perform OPERATION SHEET 1.5 through Google Classroom. (The learners may arrange available tools and materials at home)
- Let the learners discuss in a group and submit their responses through google classroom or any other relevant social media.

D. Assessment:

Contact:

- Make learners read INFORMATION SHEET 1.5 and perform OPERATION SHEET 1.5 and assess them using a checklist/performance guide. Provide necessary intervention.
- Assess learner's knowledge about how to use fire extinguishers by asking questions.
- Conduct class tests to assess their understanding.
- Let learners carry out activities of the SAMPLE SELF CHECK 1.5

- Let the learners do a presentation on using of fire extinguisher and assess as per the rubric developed.

Non-contact:

- Make learners read INFORMATION SHEET 1.5 and perform OPERATION SHEET 1: and ask them to send the short video as evidence through Google Classroom or any other relevant social media platforms. assess them using a checklist/performance guide.
- Let the student solve SAMPLE SELF CHECK 1.5 and submit the answer through google classroom or any other relevant social media.
- Give additional relevant questions from other resources-Text books/Google/YouTube and let learners submit answers through Google Classroom or any other social media platforms. Use the rubric to assess their answer.

E. Resources (online and offline):

- CBLM for Classes IX, REC
- <https://www.youtube.com/watch?v=PQV71INDaqY> (Explanation on how to use fire extinguisher)

Chapter 2: Preparing for software installation

A. Learning objectives/Broad theme/Strand/Chapter:

Learning objectives	Core concepts (chapters/topics)
2.1.1. Define computer. 2.1.2. List characteristics of computer. 2.1.3. Explain generation of computer. 2.1.4. State the functions of the computer. 2.1.5. Explain Input-Process-Output (IPO) terminology. 2.1.6. Identify basic computer components. 2.1.7. Differentiate between computer hardware and software. 2.1.8. Explain the category of software. 2.1.9. Explain the category of hardware.	2.1 Checking hardware compatibility

<p>2.1.10. List the types of computers.</p> <p>2.1.11. Explain hardware and software used in different types of computer.</p> <p>2.1.12. List minimum requirement of hardware during installation of an Operating System.</p> <p>2.1.13. Ensure to use Electrostatic discharge (ESD) tools.</p> <p>2.1.14. Ensure proper handling of tools and materials.</p>	
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B. Competencies:

- Check hardware compatibility when setting up new system or upgrading Operating System.

C. Pedagogy/Learning Experiences

Contact:

- Make the students read information sheet 2.1
- Provide handouts to learners.
- Demonstration operation sheet 2.1
- Make the students perform operation sheet 2.1
- Share the web link <https://www.youtube.com/watch?v=57NqNMIS2GE> to learn about system information and make note of it.
- Let learners discuss in a group and do the presentation, demonstration, and short video clips to explain the generation of computer, IPO terminology, computer hardware, and computer software.

Non-contact:

- Let learners read information sheet 2.1
- Provide handouts to learners through Google Classroom or any other social media platforms.
- Let the learners perform the operation sheet 2.1 and send the evidence such as pictures/videos and upload it in the google classroom/social media.

- Share the web link <https://www.youtube.com/watch?v=57NqNMIS2GE> to learn about system information and make note of it.
- Make the learners carry out self-check 2.1 and send it through Google Classroom/social media.
- Give additional questions.

D. Assessment:

Contact:

- Make learners read INFORMATION SHEET 2.1 and perform OPERATION SHEET 2.1 and assess them using a checklist/performance guide. Provide necessary intervention.
- Conduct class tests to assess their understanding.
- Let learners carry out activities of the SAMPLE SELF CHECK 2.1
- Let learners do a presentation on generations of computers.
- Assessing the learner’s presentation using a rubric developed.

Non-contact:

- Use a rubric to assess learner’s conceptual understanding on how to check the system information based on the work they have submitted 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=57NqNMIS2GE> (Explanation on system information)

A. Learning objectives/Broad theme/Strand/Chapter:

Learning objectives	Core concepts (chapters/topics)
2. Explain software compatibility. 3. Explain the consequences of not checking software compatibility. 4. State the methods to check software compatibility. 5. Use Internet.	2.2 Checking software compatibility

- | | |
|--|--|
| 6. Ensure to browse safe websites.
7. Be patient while checking software compatibility.
8. Check software compatibility. | |
|--|--|

B. Competencies:

- Check software compatibility when installing a new OS in the system or upgrading the Operating System.

C. Pedagogy/Learning Experiences

Contact:

- Let the learners read INFORMATION SHEET 2.2
- Provide handout to learners.
- Demonstration OPERATION SHEET 2.2
- Let the learners perform OPERATION SHEET 2.2
- Share the web link https://www.youtube.com/watch?v=-_hfFTV0axI to learn how to check the system information.
- Let the learners solve SAMPLE SELF CHECK 2.2

Non-contact:

- Provide handouts to learners through Google Classroom or any other social media platforms.
- Let the learners perform the OPERATION SHEET 2.2 and send the evidence such as pictures and videos and upload it in the google classroom and social media.
- Share the web link https://www.youtube.com/watch?v=-_hfFTV0axI to learn how to check the system information.
- Let learners solve SELF-CHECK 2.2 and submit it through Google Classroom/social media.
- Provide additional questions.

D. Assessment:

Contact:

- Assess while performing OPERATION SHEET 2.2 using checklist/performance guide. Provide necessary intervention.

-
- Assess learner's responses submitted in google classroom using the rubric.
 - Assess learner's response on SAMPLE SELF CHECK 2.2
 - Conduct class tests to assess their understanding.

Non-contact:

- Use a rubric to assess learner's conceptual understanding on how to check the system information based on the work they have submitted through Google Classroom and other social media.
- Assess learner's response 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=-_hfFTV0axI (Explanation on how to check the type and version of OS installed on the PC.)

A. Learning objectives/Broad theme/Strand/Chapter:

Learning objectives	Core concepts (chapters/topics)
2.3.1. State the importance of preparing for data backup and recovery. 2.3.2. Explain backup storage. 2.3.3. Describe vital things that must be considered before backup. 2.3.4. Explain backup data. 2.3.5. Segregate data. 2.3.6. Ensure to select proper backup media.	2.3 Prepare Effective Data Backup and Recovery

B. Competencies:

- Prepare for effective data backup and recovery when required to identify a secure storage device to store important documents for future use.
-

C. Pedagogy/Learning Experiences

Contact:

- Make the students read information sheet 2.3
- Provide handouts to learners.
- Let learners be in a group of 4 and give a topic let them explore information on the importance of data and different type of data backup storage. Let learners share their information with the class.
- Demonstration operation sheet 2.3
- Make the students perform operation sheet 2.3
- Let learners solve SAMPLE SLEF CHECK 2.3
- Provide additional questions.

Non-contact:

- Let learners read information sheet 2.3.
- Share the web link https://www.youtube.com/watch?v=x_jih9HukwI or other relevant resources that explain how to backup data in specific storage media.
- Provide handouts and PPT through Google Classroom/social media.
- Let learners solve SAMPLE SELF CHECK 2.3
- Provide additional questions.

D. Assessment:

Contact:

- Assessing learner's conceptual understanding on the preparation for effective data backup and recovery to prevent data loss due to storage failure through the presentation. The teacher may design their rubrics to assess' learners and accordingly provide necessary feedback and intervention based on the rating the learners receive.
 - Assess the learners' while performing OPERATION SHEET 2.3
 - Assess the learners' response on SAMPLE SELF CHECK 2.3
 - Assess the learners' answers submitted in Google Classroom/social media.
 - Conducting class tests to assess their understanding.
-

Non-contact:

- The teacher may assess conceptual understanding on the preparation of effective data backup and recovery through the works submitted by learners in the Google Classroom and other social media using rubrics/checklist and provide necessary feedback.
- Assess the learners' response on SAMPLE SELF CHECK 2.3
- Assess the learners' 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=x_jih9HukwI (Explanation on how to backup data to prevent data loss due to storage failure.)

Chapter 3: Installing Operating System and Application software

A. Learning objectives/Broad theme/Strand/Chapter:

Learning objectives	Core concepts (chapters/topics)
3.1.1 Define data backup. 3.1.2 State importance of data backup. 3.1.3 Explain the types of data backup. 3.1.4 List types of backup storage media. 3.1.5 Differentiate between device driver backup and data backup. 3.1.6 Restore data. 3.1.7 Ensure to use online backup services securely. 3.1.8 Ensure that the backup storage device is safe and has enough space.	3.1 Backing up data

B. Competencies:

- Backup data when required to format the system or storing important documents for future use.

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

- Make the students read information sheet 3.1
- Let learners explain the importance of data backup and how the data are lost.
- Demonstrate OPERATION SHEET 3.1
- Make the students perform OPERATION SHEET 3.1
- Let the learners solve SAMPLE SELF CHECK 3.1
- Provide additional questions.

Non-contact:

- Let the learners read INFORMATION SHEET 3.1
- Share the web link https://www.youtube.com/watch?v=x_jih9HukwI or other relevant resources that explain how to backup data in windows 7. The learners will watch the video and write the steps on how they have prevented data loss in the video.
- Share the web link <https://www.youtube.com/watch?v=rMbAbCKsT4A> which explains how to restore data in windows 7.
- Conduct quiz based on backup data (teacher will inform you when and how it will be conducted)
- Let the learners solve SAMPLE SELF CHECK 3.1

D. Assessment:**Contact:**

- Assess the learners' response on SAMPLE SELF CHECK 3.1.
 - Assessing learner's conceptual understanding on backing up data through the response submitted in Google Classroom/social media. The teacher may design their rubrics to assess learners and accordingly provide necessary intervention based on the rating the learners receive.
-

Non-contact:

- The teacher will assess the learners based on the quiz conducted.
- Assess the learners' notes by developing rubrics.
- Assess learners' response on SAMPLE SELC CHECK 3.1.

E. Resources (online and offline):

- Competency-Based Learning Materials for Classes IX and X, REC
- Handouts
- https://www.youtube.com/watch?v=x_jih9HukwI (Explanation on how to backup data in windows 7)
- <https://www.youtube.com/watch?v=rMbAbCKsT4A> (Explanation on how to restore data in windows 7)

A. Learning objectives/Broad theme/Strand/Chapter:

Learning objectives	Core concepts (chapters/topics)
3.2.1 State the functions of Operating System. 3.2.2 List the types of Operating System. 3.2.3 Identify versions and service pack of windows. 3.2.4 State the purpose of product key. 3.2.5 Examine methods of installation. 3.2.6 Identify key to enter the BIOS. 3.2.7 Change Boot priority in BIOS program. 3.2.8 Ensure to enter the correct product key. 3.2.9 Ensure proper handling of installation media (CD/DVD/Pen drive).	3.2 Installing Windows OS

B. Competencies:

- Install Window OS (Window 7/10) actual/Simulated workplace while performing tasks.

C. Pedagogy/Learning Experiences

Contact:

- Let the students read INFORMATION SHEET 3.2
- Demonstrate OPERATION SHEET 3.2
- Let the students perform OPERATION SHEET 3.2
- Let the learners solve SAMPLE SELF CHECK 3.2

Non-contact:

- Let the learners read INFORMATION SHEET 3.2
- Provide handouts to learners through Google Classroom or any other social media platforms.
- Prepare short video lessons to introduce the installation of the operating system and share through google classroom or social media.
- Share the web link <https://www.youtube.com/watch?v=SKbR6XT7fcA> which explains how to install the windows 10 operating system using the USB drive.
 - ✓ Pause the video and make notes accordingly.
 - ✓ Upload the notes taking in google classroom or social media.
- Share the web link <https://www.youtube.com/watch?v=VkWTTYaKz9o> which explains how to install the windows 7 operating system using CD/DVD.
 - ✓ Pause the video and make notes accordingly.
 - ✓ Upload the notes taken in Google Classroom or social media.
- Let the learners solve SAMPLE SELF CHECK 3.2
- Provide additional questions.

D. Assessment:

Contact:

- Assessing learner's ability to perform OPERATION SHEET 3.2 using the checklist. Provide necessary feedback.
- Assess the learners' response on SAMPLE SELF CHECK 3.2.
- Conduct viva to assess their understanding.

Non-contact:

- Use the rubrics to assess learner’s notes upload in Google Classroom or social media.
- Assess the learners’ response on SAMPLE SELF CHECK 3.2.
- Assess the learners’ 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=SKbR6XT7fcA> (Explanation on how to install windows 10 operating system using the USB drive.)
- <https://www.youtube.com/watch?v=VkWTTYaKz9o> (Explanation on how to install windows 7 operating system using CD/DVD)

A. Learning objectives/Broad theme/Strand/Chapter:

Learning objectives	Core concepts (chapters/topics)
3.3.1 List the function of device manager. 3.3.2 Interpret signs of device driver fault. 3.3.3 Examine ways to install device drivers. 3.3.4 Update Device driver. 3.3.5 Ensure to follow the instruction while installing. 3.3.6 Ensure to download the device driver from safe manufacture website.	3.3 Installing inbuilt device driver

B. Competencies:

- Installing device drivers when device malfunction or device drivers missing.

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

- Let the learners read INFORMATION SHEET 3.3
- Demonstrate OPERATION SHEET 3.3
- Let the learners perform OPERATION SHEET 3.3

- Let learners solve SAMPLE SELF CHECK 3.3.

Non-contact:

- Let the learners read INFORMATION SHEET 3.3.
- Provide handouts to learners through Google Classroom or any other social media platforms.
- Share the web link <https://www.youtube.com/watch?v=IIDjHdpFbcU> which explains how to update device drivers. Make note of it and submit it through Google Classroom/social media.
- Let the learners solve SAMPLE SELF CHECK 3.3.

D. Assessment:

Contact:

- Assess the learners’ performance referring to OPERATION SHEET 3.3.
- Assess the learners’ response on SAMPLE SELF CHECK 3.3.

Non-contact:

- Assess the learners’ notes using standard rubrics.
- Assess the learners’ response on SAMPLE SELF CHECK 3.3

E. Resources (online and offline):

- Competency-Based Learning Materials for Classes IX and X, REC
- Handouts
- <https://www.youtube.com/watch?v=IIDjHdpFbcU> (Explanation on how to update device drivers.)

A. Learning objectives/Broad theme/Strand/Chapter:

Learning objectives	Core concepts (chapters/topics)
3.4.1. State function of application software. 3.4.2. List the types of application software. 3.4.3. Differentiate between trial and licensed version.	3.4 Installing application software

<p>3.4.4. Explain the function of ‘Setup’ file, ‘ReadMe’ file and ‘Serial Key’.</p> <p>3.4.5. Generate product key to activate software.</p> <p>3.4.6. Ensure to scan the installation media before installation.</p> <p>3.4.7. Ensure proper handling of installation media.</p>	
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B. Competencies:

- Install Application software when application software is corrupted or upgrading.

C. Pedagogy/Learning Experiences

Contact:

- Let the learners’ students read INFORMATION SHEET 3.4
- Demonstrate OPERATION SHEET 3.4
- Let the learners’ students perform OPERATION SHEET 3.4
- Let the learners solve SAMPLE SELF CHECK 3.4.

Non-contact:

- Let the learners’ students read INFORMATION SHEET 3.4
- Share the weblink:
- <https://www.youtube.com/watch?v=0kBC4evdRZc>
- <https://www.youtube.com/watch?v=6ZGhDPfSXXA>
- <http://www.zeplanner.net/support/faqs/what-is-the-difference-between-the-trial-version-and-the-licensed-one/> to learners which explains how to activate the software, installing software, and the difference between trial and licensed version.
- Let the learners watch the videos and make notes of each video.
- Let the learners differentiate between the trial and licensed version and submit the completed work in Google Classroom/social media.
- Let the learners solve SAMPLE SELF CHECK 3.4.

D. Assessment:**Contact:**

- Assess the learners' performance OPERATION SHEET 3.4
- Assess the learners' response on SAMPLE SELF CHECK 3.4.

Non-contact:

- Assess the learners' notes using standard rubrics.
- Assess the learners' response on SAMPLE SELF CHECK 3.4

E. Resources (online and offline):

- Competency-Based Learning Materials for Classes IX and X, REC
- Handouts
- <https://www.youtube.com/watch?v=0kBC4evdRZc> (Explanation on how to activate the software.)
- <https://www.youtube.com/watch?v=6ZGhDPfSXXA> (Explanation on the steps to install any software application.)
- <http://www.zeplanner.net/support/faqs/what-is-the-difference-between-the-trial-version-and-the-licensed-one/> (Explanation on the difference between trial and license version of applications software.)

A. Learning objectives/Broad theme/Strand/Chapter:

Learning objectives	Core concepts (chapters/topics)
3.5.1 List file systems to format HDD/storage media. 3.5.2 Differentiate between FAT and NTFS file system. 3.5.3 Illustrate reasons to format. 3.5.4 List the types of formatting. 3.5.5 Ensure to backup important data before Format. 3.5.6 Be patient while formatting Hard disk drive.	3.5 Formatting HDD (After installation of OS)

B. Competencies:

- Format Hard Disk Drive (HDD) when Pre-installed OS is affected by malware or upgrade OS.

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

- Let the learners' read INFORMATION SHEET 3.5
- Share the web link <https://www.youtube.com/watch?v=wraXVTxKNYw> on how to format the drive and partition it while installing new windows OS, let the learners present the information obtained through the video to the class in the form of a presentation (in a group).
- Demonstrate OPERATION SHEET 3.5
- Let the learners perform OPERATION SHEET 3.5
- Let the learners solve SAMPLE SELF CHECK 3.5

Non-contact:

- Let the learners' read INFORMATION SHEET 3.5
- Share the web link <https://www.youtube.com/watch?v=j8s3nwYnUaw> on formatting hard disk drive.
- Let the learner watches the video.
- Based on the information gathered the learner lists down the steps to format hard disk drive and submits in Google Classroom.
- Let the learners solve SAMPLE SELF CHECK 3.5

D. Assessment:**Contact:**

- Assess the learner based on the presentation using a rubric or a checklist. Provide necessary feedback and intervention if needed.
- Conduct viva based on OPERATION SHEET 3.5
- Assess the learners' response on SAMPLE SELF CHECK 3.5

Non-contact:

- Assess the work uploaded in the Google Classroom to assess learner’s understanding of formatting hard disk drives. Provide necessary feedback following the assessment.
- Assess the learners’ response on SAMPLE SELF CHECK 3.5

E. Resources (online and offline):

- Competency-Based Learning Materials for Classes IX and X, REC
- Handouts
- <https://www.youtube.com/watch?v=wraXVTxKNYw> (Explanation on how to format hard disk drive while installing new window OS.)
- (<https://www.youtube.com/watch?v=j8s3nwYnUaw> (Explanation on how to format a hard disk drive through disk management.)

A. Learning objectives/Broad theme/Strand/Chapter:

Learning objectives	Core concepts (chapters/topics)
3.6.1 State function of Disk Management tools. 3.6.2 List advantages of partition HDD from disk management. 3.6.3 Indicate ways to browse disk management window. 3.6.4 Browse “disk management” tool. 3.6.5 Ensure to shrink volume from the drive other than OS containing drive. 3.6.6 Be patient while customizing disk partition.	3.6 Customizing disk partition (through Disk management)

B. Competencies:

- Customize disk partition when formatting and extra partitions are required.

C. Pedagogy/Learning Experiences

Contact:

- Let the learners read INFORMATION SHEET 3.6
- The learner explores the internet to look for information on the advantages and disadvantages of partitioning HDD from disk management utility and the ways to browse disk management other than given in the IX textbook, page 98. Make note of it
- Demonstrate OPERATION SHEET 3.6
- Let learners perform OPERATION SHEET 3.6.
- Let the learners solve OPERATION SHEET 3.6.

Non-contact:

- Let the learners read INFORMATION SHEET 3.6
- Provide handouts to learners through Google Classroom or any other social media platforms.
- Share the web link <https://www.youtube.com/watch?v=j8s3nwYnUaw> to learn on formatting the hard disk drive.
 - ✓ The learner watches the video and makes the summary of a video. Upload summary in the google classroom and other social media.
- Let the learners solve OPERATION SHEET 3.6.
- Provide additional questions

D. Assessment:

Contact:

- Assess the learners based on the note submitted using rubrics.
- Assess the learners' while performing OPERATION SHEET 3.6
- Assess the learners' response on SAMPLE SELF CHECK 3.6.

Non-contact:

- Assess the work uploaded in the Google Classroom to assess learner's understanding of customizing disk partition. Provide necessary feedback following the assessment.
- Assess the learners' response on SAMPLE SELF CHECK 3.6.
- Assess the learners' answer submitted 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=j8s3nwYnUaw> (Explanation on how to customizing disk partition.)

A. Learning objectives/Broad theme/Strand/Chapter:

Learning objectives	Core concepts (chapters/topics)
3.7.1 Define control panel. 3.7.2 Describe control panel options. 3.7.3 Determine ways to browse control panel. 3.7.4 Ensure to make changes on the setting.	3.7 Configuring software

B. Competencies:

- Configure software when PC is formatted or OS is upgraded.

C. Pedagogy/Learning Experiences

Contact:

- Let the learners' read INFORMATION SHEET 3.7
- Let the learner be in a group and discuss the control panel option. Let the learners share their viewpoints with the class with explanations and reasons.
- Demonstrate OPERATION SHEET 3.7.
- Let the learners perform OPERATION SHEET 3.7
- Let the learners' solver OPERATION SHEET 3.7

Non-contact:

- Let the learners' read INFORMATION SHEET 3.7
-

-
- Share the web link <https://www.youtube.com/watch?v=Uw1RbuNfzQk> to learn about the control panel and app setting.
 - ✓ Let the learners watch the video and make notes on each function of the control panels.
Submit the notes through Google Classroom.
 - Let the learners' solver OPERATION SHEET 3.7
 - Provide additional questions.

D. Assessment:

Contact:

- Assess the learner's conceptual understanding based on the group presentation or finding using rubrics or checklist.
- Assess the learners' while performing OPERATIONS SHEET 3.7
- Assess the learners' response on SAMPLE SELF CHECK 3.7

Non-contact:

- Assess the work uploaded in the google classroom to assess the learner's understanding of the control panel. Provide necessary feedback following the assessment.
- Assess learners' response on SAMPLE SELF CHECK 3.7
- Assess learners' answers submitted 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=Uw1RbuNfzQk> (Explanation on control panel options and app setting.)
-

Chapter 4: Performing PC Assembly

A. Learning objectives/Broad theme/Strand/Chapter:

Learning objectives	Core concepts (chapters/topics)
4.1.1. Classify tools, materials and equipment for computer maintenance. 4.1.2. Explain Electrostatic-Sensitive Device (ESD) equipment. 4.1.3. Explain Safe-working of ESD. 4.1.4. Explain precautionary ESD signs and symbols. 4.1.5. Ensure to identify the right tools for the right work 4.1.6. Identify tools, materials, and equipment for computer maintenance	4.1 Identifying tools, materials, and equipment for computer maintenance

B. Competencies:

- Identify tools, materials, and equipment for computer maintenance when repairing or performing computer maintenance and networking.

C. Pedagogy/Learning Experiences

Contact:

- Let the learners' read INFORMATION SHEET 4.1
- Let the learner be in a group and discuss the tools, equipment, materials required to do computer maintenance and let them share their information to the class with the uses/functions of the identified tools, equipment, and materials needed for computer maintenance.
- Demonstrate OPERATIONS SHEET 4.1
- Let the learners perform OPERATION SHEET 4.1
- Let the learners solve SAMPLE SELF CHECK 4.1

Non-contact:

-
- Share the web link <https://www.youtube.com/watch?v=Cv8-TsSKEhY&t=140s> and <https://www.slideshare.net/cjan22/computer-hardware-servicing-tools> which explain the tools, equipment, and materials required to perform computer maintenances.
 - ✓ Let the learners write the functions of each tool, equipment, materials while drawing and submit it through google classroom.
 - Let the learners perform OPERATION SHEET 4.1 and make short video clips. Submit the video clips through Google Classroom/social media.
 - Let the learners solve SAMPLE SELF CHECK 4.1

D. Assessment:

Contact:

- Assess the learners based on the group presentation and finding by the group using rubrics or checklist.
- Assess the learners' performance on OPERATION SHEET 4.1
- Assess the learners' response on SAMPLE SELF CHECK 4.1

Non-contact:

- Assess the learner's notes gathered from the video using rubrics.
- Assess the learners' performance on OPERATION SHEET 4.1
- Assess the learners' response on SAMPLE 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=Cv8-TsSKEhY&t=140s> (Explanation on the tools, equipment, and materials required to perform computer maintenances.)
 - <https://www.slideshare.net/cjan22/computer-hardware-servicing-tools> (Explanation on the tools, equipment, and materials required to perform computer maintenances.)
-

A. Learning objectives/Broad theme/Strand/Chapter:

Learning objectives	Core concepts (chapters/topics)
4.2.1. Define the motherboard. 4.2.2. Label components of the motherboard. 4.2.3. Classify types of motherboard. 4.2.4. Label system case. 4.2.5. List types of the system case. 4.2.6. State functions of stand-off. 4.2.7. Ensure to avoid dropping the screws on motherboard to prevent short circuits. 4.2.8. Ensure to use anti-static wristband while fixing the motherboard. 4.2.9. Ensure safe handling of tools, materials and Motherboard. 4.2.10. Fix motherboard	4.2 Fixing Motherboard

B. Competencies:

- Fix Motherboard when motherboard fails to work

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

- Let the learners' read INFORMATION SHEET 4.2
- Provide handouts and PPT.
- Demonstrate OPERATION SHEET 4.2
- Let the learners perform OPERATION SHEET 4.2
- Let the learners solve SAMPLE SELF CHECK 4.2
- Provide additional questions.

Non-contact

- Let the learners' read INFORMATION SHEET 4.2

-
- Share the web link <https://www.youtube.com/watch?v=cuQiTMKZGA4> to learn how to install the motherboard or replace the motherboard if malfunctions.
 - Let the learners explore the web link <https://www.youtube.com/watch?v=cuQiTMKZGA4> and make notes of the steps to install the motherboard.
 - Let the learners solve SAMPLE SELF CHECK 4.2
 - Provide additional questions.

D. Assessment:

Contact:

- Assess the learners' performance on OPERATIONS SHEET 4.2
- Assess the learners' response on SAMPLE SELF CHECK 4.2
- Assess the learners base on the answer submitted through Google Classroom/social media using the rubric.
- Provide necessary intervention following the assessment

Non-contact:

- Assess the learner's notes uploaded in the Google Classroom to assess the learner's conceptual understanding of fixing the motherboard and provide intervention accordingly.
- Assess the learners' response on SAMPLE SELF CHECK 4.2
- Assess the learners base on the answer submitted through 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=cuQiTMKZGA4> (Explanation on how to install motherboard or replace the motherboard if malfunctions.)
-

A. Learning objectives/Broad theme/Strand/Chapter:

Learning objectives	Core concepts (chapters/topics)
4.3.1 Define CPU. 4.3.2 Explain CPU Frequency. 4.3.3 Categorize types of CPU. 4.3.4 Interpret CPU alignment. 4.3.5 List types of sockets. 4.3.6 Describe the effect of binding pins. 4.3.7 Ensure to align CPU on the socket after interpreting identification marks 4.3.8 Ensure to use anti-static wrist band 4.3.9 Ensure to switch off the power supply 4.3.10 Ensure to maintain Zero Insertion force (ZIF)while fixing CPU 4.3.11 Mount CPU	4.3 Mounting Central Processing Unit (CPU)

B. Competencies:

- Mount CPU when CPU malfunctions or upgrading

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

- Let the learners' read INFORMATION SHEET 4.3
- Demonstrate OPERATION SHEET 4.3
- Let the learners perform OPERATION SHEET 4.3
- Let the learners solve SAMPLE SELF-CHECK 4.3

Non-contact:

- Let the learners' read INFORMATION SHEET 4.3
- Share the web link <https://www.youtube.com/watch?v=H3yTF6wqTbg&t=118s> through Google Classroom.

✓ Let the learners make a note of the steps to mount the CPU on the motherboard.

- Let the learners solve SAMPLE SELF-CHECK 4.3.
- Provide additional questions.

D. Assessment:

Contact:

- Assess the learners' performance referring to OPERATION SHEET 4.3.
- Provide necessary intervention and feedback.
- Assess the learners' response on SAMPLE SELF CHECK 4.3
- Conduct class test to assess learners' conceptual understanding of mounting CPU

Non-contact:

- Assess the learner's notes submitted through Google Classroom or social media using rubrics or checklists.
- Assess the learners' response on SAMPLE SELF CHECK 4.3
- Assess the learners' answers submitted 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=cuQiTMKZGA4> (Explanation on how to install motherboard or replace the motherboard if malfunctions.)

A. Learning objectives/Broad theme/Strand/Chapter:

Learning objectives	Core concepts (chapters/topics)
4.4.1 Define CPU fan. 4.4.2 Explain propose of locking CPU fan. 4.4.3 Explain computer cooling mechanisms and its function.	4.4 Mounting CPU fan

<p>4.4.4 Ensure CPU fan is properly aligned and tightened.</p> <p>4.4.5 Ensure proper handling of CPU fan and tools.</p> <p>4.4.6 Ensure power supply is unplugged.</p> <p>4.4.7 Mount CPU fan</p>	
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B. Competencies:

- Mount CPU fan when the system gives a heat-related error.

C. Pedagogy/Learning Experiences

Contact:

- Let the learners read INFORMATION SHEET 4.4
- Let the learners present the computer cooling mechanism and its functions in the group.
- Demonstrate OPERATION SHEET 4.4
- Let the learners perform OPERATION SHEET 4.4
- Let the learners solve SAMPLE SELF-CHECK 4.4

Non-contact

- Let the learners read INFORMATION SHEET 4.4
- The teacher may ask the learner to explore for information on the types of computer cooling mechanism and their functions.
 - ✓ Let the learners look for information.
 - ✓ Base on the information obtain, let learners make a presentation slide and upload it in google classroom.
- Let the learners solve SAMPLE SELF-CHECK 4.4
- Provide additional questions

D. Assessment:**Contact:**

- Assess the learner’s ability to present the computer cooling mechanism and its functions using a rubric or checklist. Provide necessary intervention.
- Assess the learners’ performance referring to OPERATION SHEET 4.4
- Assess the learners’ response on SAMPLE SELF CHECK 4.4.
- Conduct viva to assess their conceptual understanding of mounting CPU fans.

Non-contact:

- Assess the learner through the presentation slide posted in the Google Classroom or social media and provide necessary feedback.
- Assess the learners’ performance referring to OPERATION SHEET 4.4
- Assess the learners’ response on SAMPLE SELF CHECK 4.4.
- Assess the learners’ base on the answer submitted through 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	Core concepts (chapters/topics)
4.5.1 List types of computer memory. 4.5.2 Explain the differences between ROM and RAM. 4.5.3 Classify types and size of RAM. 4.5.4 Ensure RAM is sited firmly. 4.5.5 Ensure retaining clips are properly locked. 4.5.6 Ensure compatible RAM is installed according to requirements. 4.5.7 Ensure to handle RAM lock with care. 4.5.8 Ensure to use an ant-static wrist band.	4.5 Fixing RAM

B. Competencies:

- Fix RAM when a new system requires replacement of the RAM or when there is no display on the screen.

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

- Let the learners read INFORMATION SHEET 4.5
- Let the learners explore information on the types of computer memory and take note of it.
- Demonstrate operation SHEET 4.5
- Let the learners perform OPERATION SHEET 4.5
- Let the learners solve SAMPLE SELF-CHECK 4.5

Non-contact

- Let the learners read INFORMATION SHEET 4.5
- Share the web link <https://www.slideshare.net/ruchimaurya487/random-access-memory-41525385> to learn to fix RAM.
- Let the learners differentiate between different type of RAM and submit it through Google Classroom/social media.
- Let the learners explore information on different ways to identify DDR RAM and submit it through Google Classroom/social media.
- Let the learners solve SAMPLE SELF-CHECK 4.5

D. Assessment:**Contact:**

- Assess the learner's ability to perform operation sheet 4.5 using a rubric or checklist. Provide necessary intervention.
- Assess the learners' performance referring to OPERATION SHEET 4.5
- Assess the learners' response on SAMPLE SELF CHECK 4.5.

Non-contact:

- Assess the learner through the answers posted in the Google Classroom or social media and provide necessary feedback.
- Assess the learners' response on SAMPLE SELF CHECK 4.5.

E. Resources (online and offline):

- Competency-Based Learning Materials for Classes IX and X, REC
- Handouts
- <https://www.slideshare.net/ruchimaurya487/random-access-memory-41525385>
(Explanation of different types of computer RAM.)

A. Learning objectives/Broad theme/Strand/Chapter:

Learning objectives	Core concepts (chapters/topics)
4.6.1. State types of expansion slot. 4.6.2. List types of PCI card used. 4.6.3. State purpose of adding cards. 4.6.4. Ensure to use antistatic wristband while installing Add-on card. 4.6.5. Ensure safely handling Add-on cards.	4.6 Installing Add-on cards

B. Competencies:

- Install Add-on card when integrated ports fail to work or upgrading.

C. Pedagogy/Learning Experiences

Contact:

- Let the learners read INFORMATION SHEET 4.6
- Demonstrate OPERATION SHEET 4.6
- Let the learners perform OPERATION SHEET 4.6
- Solve SAMPLE SELF-CHECK 4.6
- Let the learners do project work on installing add-on cards.

Non-contact:

- Let the learners read INFORMATION SHEET 4.6
- The teacher may provide handouts to learners through Google Classroom or any other social media platforms.
- Share the web link <https://www.youtube.com/watch?v=i60-u3JnLJo> to learn how to install add-on cards.
 - ✓ Let the learners go through the video and prepare short notes on different types of PCI cards and steps to install add-on cards.
- Solve SAMPLE SELF-CHECK 4.6
- Provide additional questions

D. Assessment:

Contact:

- Assess the learners' performance referring to OPERATION SHEET 4.6.
- Provide necessary intervention and feedback.
- Assess the learners' response on SAMPLE SELF CHECK 4.6.
- Assess the learner's project using the rubric.
- Conduct viva to assess their conceptual understanding of installing add-on cards.

Non-contact:

- Assess the notes submitted by the learner to assess the learner's conceptual understanding of different types of PCI cards and installing add-on cards using a checklist.
- Assess the learners' response on SAMPLE SELF CHECK 4.6.
- Assess the learner's answer posted in Google Classroom/social media using the rubric.

Resources (online and offline):

- Competency-Based Learning Materials for Classes IX and X, REC
- Handouts
- <https://www.youtube.com/watch?v=i60-u3JnLJo> (Explanation on how to install add-on cards.)

RESOURCES

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