

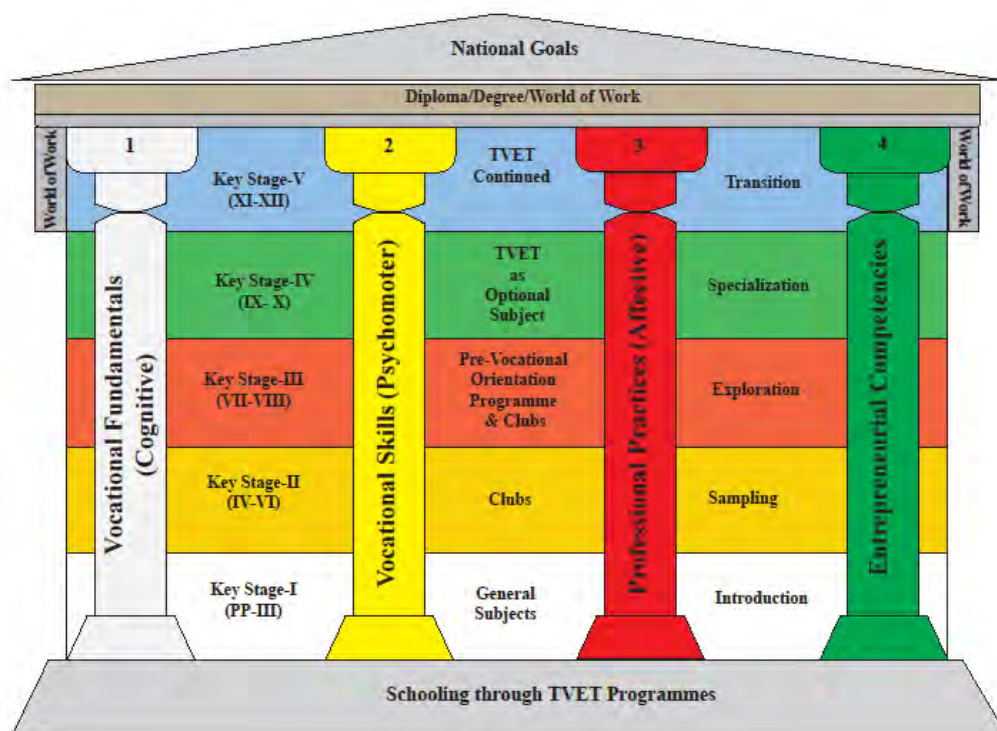
TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING (TVET)

NEW NORMAL CURRICULUM

INSTRUCTIONAL GUIDE

(PLUMBING)

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 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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Chapter 3: Carrying out basic masonry works.

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

Learning objectives	Core concepts (Chapters/Topics)
3.9.1 Define plastering 3.9.2 State types of plastering 3.9.3 Explain the purpose of patches 3.9.4 State types of defects in plastering 3.9.5 Explain the purpose of curing 3.9.6 Perform plastering. 3.9.7 <i>Ensure proper handling of tools and material</i> 3.9.8 <i>Ensure appropriate use of hand gloves, apron, and helmet</i>	3.9 Performing plaster

B. Competencies:

- i) Perform plastering as per the standard procedure.

C. Pedagogy/Learning Experiences

• Contact:

- ✓ Brainstorm on the importance of laying water pipelines.
- ✓ Lecture-based on INFORMATION SHEET 3.9 and make students go through it.
- ✓ Demonstrate on wall plastering.
- ✓ Share the link <https://youtu.be/LyngzAYIuZs> which explains on plastering wall.
- ✓ Provide guided practice
- ✓ Let them practice individually.
- ✓ Arrange site visit.

• Non-contact:

- ✓ Share the link <https://youtu.be/LyngzAYIuZs> which explains wall plastering through other resources such as video clips, handouts, etc through Google Classroom or any other social media platforms.
- ✓ Provide handouts to learners through Google Classroom or any other social media platforms.
- ✓ The learners should study INFORMATION SHEET 3.9 and OPERATION SHEET 3.9.

D. Assessment:

• **Contact:**

- ✓ Make learners read INFORMATION SHEET 3.9 and perform OPERATION SHEET 3.9 and assess them using a checklist/performance guide.
- ✓ Let learners carry out activities of the SAMPLE SELF CHECK 1.1
- ✓ Give additional questions from CBLM.
- ✓ Assess the learner's ability through conducting oral OR written tests.

• **Non-contact:**

- ✓ Make learners solve the SAMPLE SELF CHECK 3.9 that fulfills objectives and send answers through Google Classroom or any other social media platforms.
- ✓ Written test through Kahoot.
- ✓ Assess through oral/viva-voce

E. Resources (online and offline):

- Competency-Based Learning Materials, REC
- Handouts
- PPT
- <https://youtu.be/LyngzAYIuZs> (Explanation on wall plastering)

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

Learning objectives	Core concepts (Chapters/Topics)
3.10.1 Define re-bar 3.10.2 Explain the types of re-bar 3.10.3 State the size of the re-bar and its unit weight 3.10.4 State the importance of cutting, bending, placing, and binding 3.10.5 Differentiate between RCC and Plain Cement Concrete (PCC) 3.10.6 State the purpose of reinforcement bar 3.10.7 Explain the purpose of the formwork 3.10.8 Perform basic reinforced cement concrete. 3.10.9 <i>Ensure proper handling of Die and bending hook.</i> 3.10.10 <i>Ensure appropriate use of hand gloves, apron, and helmet</i>	3.10 Performing basic Reinforced Cement Concrete (RCC) work

- **Competencies**
 - i) Perform RRC wall maintaining the dimension as per the given drawing.
- **Pedagogy/Learning Experience**
 - **Contact:**
 - ✓ Lecture-based on INFORMATION SHEET 3.10
 - ✓ Demonstrate on OPERATION SHEET 3.10
 - ✓ Make the learners perform OPERATION SHEET 3.10
 - ✓ Share the web link https://youtu.be/npLKj_va3Y8 which explaining on the difference between RCC and PCC
 - **Non-contact:**
 - ✓ Make learners go through INFORMATION SHEET 3.10 and OPERATION SHEET 3.10.
 - ✓ Provide PPT on types of re-bar and purpose of reinforcement.
 - ✓ Share web link https://youtu.be/npLKj_va3Y8 which explains the difference between RCC and PCC
 - **Contact:**
 - ✓ Make learners perform OPERATION SHEET 3.10.
 - ✓ Make learners solve the SAMPLE SELF CHECK 2.14 that fulfills objectives and competency.
 - ✓ Frame questions from CBLM and other resources-Google/YouTube.
 - ✓ Assess the learners' ability to cut channels by preparing a rubric.

- **Non-contact:**

- ✓ Make learners solve the SAMPLE SELF CHECK 2.14 that fulfills objectives and competency send answers through Google Classroom or any other social media platforms.
- ✓ Give additional questions from CBLM and other resources-Google/YouTube and let learners submit answers through Google Classroom or any other social media platforms.
- ✓ Written test through Kahoot.
- ✓ Assess through oral/viva-voce

E. Resources (online and offline):

- Competency-Based Learning Materials, REC
- https://youtu.be/npLKj_va3Y8 (Explanation on the difference between RCC and PCC)
- PPT

Chapter 4: Install water storage

A. Learning objectives/Broad theme/Strand/Chapter

Learning objectives	Core concepts (Chapters/Topics)
4.1.1 Explain the sign and symbol for the storage tank and its components. 4.1.2 Explain the drawing of the storage tank. 4.1.3 Interpret drawing of the storage tank. 4.1.4 <i>Ensure correct interpretation of the drawing.</i>	4.1 Interpreting drawing of the storage tank

A. Competencies

- i) Interpret drawing of different storage tanks.

B. Pedagogy/Learning experience

- **Contact:**

- ✓ Brainstorm on the sign and symbol storage tank
- ✓ Lecture-based on INFORMATION SHEET 4.1 and make students go through it.
- ✓ Make learners go through OPERATION SHEET 4.1.
- ✓ Provide PPT on components of the storage tank
- ✓ Arrange site visit.

- **Non-contact:**

- ✓ Let the learners go through INFORMATION SHEET 4.1 and OPERATION SHEET 4.1
- ✓ Provide PPT on components of the storage tank (need to prepare by self)
- ✓ Explain PPT through Camtasia(need to prepare by self)

C. Assessment

- **Contact:**

- ✓ The teacher develops a rubric to assess learners while performing OPERATION SHEET 4.1
- ✓ Make learners solve the SAMPLE SELF CHECK 4.1
- ✓ Frame questions from CBLM and other resources-Google/YouTube.

- **Non-contact:**

- ✓ Ask learners to solve the SAMPLE SELF CHECK 4.1 and send answers through Google Classroom or any other social media platforms.
- ✓ Give additional questions from CBLM and other resources-Google/YouTube and let learners submit answers through Google Classroom or any other social media platforms.
- ✓ Assess through oral/viva-voce
- ✓ Conduct written test through Kahoot.

D. Resources (online and offline)

- ✓ CBLM, REC
- ✓ Handout.
- ✓ PPT

A. Learning objectives/Broad theme/Strand/Chapter

Learning objectives	Core concepts (Chapters/Topics)
4.2.1 Explain the importance of studying site location. 4.2.2 State the types of report writing. 4.2.3 Study site location. 4.2.4 <i>Exhibit honesty.</i> 4.2.5 <i>Work in team.</i>	4.2 Studying site location

B. Competencies

- i) Study site location to assess installation of any storage tank.

C. Pedagogy/Learning experience

- **Contact:**

- ✓ Lecture on-site location
- ✓ Make learners go through information 4.2
- ✓ Make learners go through OPERATION SHEET 4.2
- ✓ Provide PPT on report writing.

- **Non-contact:**

- ✓ Make learners go through INFORMATION SHEET 4.2
- ✓ Make learners go through OPERATION SHEET 4.2
- ✓ Provide PPT on report writing.
- ✓ Explain PPT through Audiovisual.

D. Assessment

- **Contact:**

- ✓ Make learners perform OPERATION SHEET 4.2
- ✓ Make learners solve the SAMPLE SELF CHECK 4.2
- ✓ Assess the learner's ability through conducting written/oral tests.

- **Non-contact:**

- ✓ Make learners solve the SAMPLE SELF CHECK 4.2 and send the answers through Google Classroom or any other social media platforms.
- ✓ Written test through Kahoot.
- ✓ Assess through oral/viva-voce

E. Resources (online and offline)

- Competency-Based Learning Materials, REC
- PPT

A. Learning objectives/Broad theme/Strand/Chapter

Learning objectives	Core concepts (Chapters/Topics)
4.3.6 Define bedding. 4.3.7 Explain the types of bedding. 4.3.8 Explain the purpose of tank bedding. 4.3.9 Prepare tank bedding. 4.3.10 <i>Work in a team.</i> 4.3.11 <i>Ensure proper handling of tools and materials.</i> 4.3.12 <i>Ensure appropriate use of hand gloves and an apron.</i>	4.3 Preparing tank bedding

B. Competencies

- i) Prepare tank bedding as required to install water on the ground/source.

C. Pedagogy/Learning experience

• Contact:

- ✓ Make the learners read INFORMATION SHEET 4.3
- ✓ Make the learners perform OPERATION SHEET 4.3
- ✓ Share the web link <https://youtu.be/IUhElusVM2Y> which explains the preparation of tank bedding.
- ✓ Demonstrate on OPERATION SHEET 4.3
- ✓ Provide guided practices
- ✓ Let them practices individually.

• Non-contact

- ✓ Make learners go through INFORMATION SHEET 4.3
- ✓ Make learners go through OPERATION SHEET 4.3
- ✓ Share the web link <https://youtu.be/IUhElusVM2Y> other resources such as video clips, handouts, etc through Google Classroom or any other social media platforms.
- ✓ Provide PPT on the purpose of tank bedding.

D. Assessment

• Contact:

- ✓ As soon as the learners are aware of tank bedding, ask them to perform OPERATION SHEET 4.3 and keep on practicing while performing any task.
- ✓ Make learners solve the SAMPLE SELF CHECK 4.3
- ✓ Assess the learner's ability through conducting oral tests or written tests.

- **Non-contact:**

- ✓ Make learners solve the SAMPLE SELF CHECK 4.3 and send the answers through Google Classroom or any other social media platforms.
- ✓ Written test through Kahoot.
- ✓ Assess through oral/viva-voce

E. Resources (online and offline)

- CBLM, REC
- <https://youtu.be/1UhElusVM2Y> (Preparation on tank bedding)
- PPT

A. Learning objectives/Broad theme/Strand/Chapter

Learning objectives	Core concepts (Chapters/Topics)
4.4.13 Define storage tank. 4.4.14 List the components of the storage tank and their functions. 4.4.15 Explain the working principle of the float valve. 4.4.16 List the types of storage tank capacity. 4.4.17 Explain the types of the storage tank. 4.4.18 State the advantages and disadvantages of the storage tank. 4.4.19 Fix tank components. 4.4.20 <i>Ensure proper handling of drilling machine, pipe wrench, adjustable, and screwdriver.</i> 4.4.21 <i>Ensure economic use of materials.</i> 4.4.22 <i>Ensure appropriate use of hand gloves and helmet</i>	4.4 Fixing tank components

B. Competencies

- i) Fix tank component as per the given drawing/ requirement.

C. Pedagogy/Learning experience

- **Contact:**

- ✓ Make learners go through INFORMATION SHEET 4.4
- ✓ Demonstrate on OPERATION SHEET 4.4
- ✓ Make learners perform OPERATION SHEET 4.4
- ✓ Provide guided practices

- **Non-contact:**

- ✓ Make learners go through INFORMATION SHEET 4.4 and OPERATION SHEET 4.4
- ✓ Provide PPT on components of the tank and their function.
- ✓ Provide handouts, self-made tutorial video clips, and PPT through Google Classroom or any other relevant social media.

D. Assessment

- **Contact:**

- ✓ As soon as the learners are aware of the fixing component of the tank, ask them to perform OPERATION SHEET 4.4 and keep on practicing while performing any task.
- ✓ Make learners solve SAMPLE SELF CHECK 4.4 and give additional questions from CBLM and other resources.
- ✓ Assess the learner's ability through conducting oral OR written tests.

- **Non-contact:**

- ✓ Ask learners to solve the SAMPLE SELF CHECK 4.4 and send the answers through Google Classroom or any other social media platforms.
- ✓ Frame questions using different sources and let the learners submit answers through Google Classroom or any other social media platforms.
- ✓ Written test through Kahoot.
- ✓ Assess through oral/viva-voce

E. Resources (online and offline)

- CBLM, REC
- PPT

A. Learning objectives/Broad theme/Strand/Chapter

Learning objectives	Core concepts (Chapters/Topics)
4.5.23 List the types of valve and their application. 4.5.24 Explain the function of the union. 4.5.25 Explain the purpose of using vent pipe. 4.5.26 Explain the importance of checking leakage. 4.5.27 Explain the importance of checking the flow direction of the gate valve. 4.5.28 Mount storage tank. 4.5.29 <i>Ensure proper handling of the storage tank.</i> 4.5.30 <i>Ensure appropriate use of helmet, hand glove, apron, and safety belt.</i>	4.5 Mounting storage tank

A. Competencies

- i) Mount storage tank as per standard

B. Pedagogy/Learning experience

- **Contact:**
 - ✓ Lecture-based on INFORMATION SHEET 4.5
 - ✓ Make learners go through INFORMATION SHEET 4.5
 - ✓ Provide PPT on types of valve and their application.
 - ✓ Make learners go through OPERATION SHEET 4.5
 - ✓ Demonstrate on OPERATION SHEET 4.5
 - ✓ Provide guided practice on OPERATION SHEET 4.5
- **Non-contact:**
 - ✓ Make learners go through INFORMATION SHEET 4.5 and OPERATION SHEET 4.5 through Google Classroom.
 - ✓ Provide PPT on types of valve and their application through Audiovisual

C. Assessment

- **Contact:**
 - ✓ Make learners solve SAMPLE SELF CHECK 4.5 and give additional questions from CBLM.
 - ✓ Conduct a test (quiz, true or false, puzzle or short answer type questions) through Kahoot.
- **Non-contact:**
 - ✓ Make learners solve SAMPLE SELF CHECK 4.5 and give additional questions from CBLM and instruct them to send their works through Google Classroom or any other resources.

- ✓ Conduct a test (quiz, true or false, puzzle or short answer type questions) using Kahoot through Google Classroom.

D. Resources (online and offline)

- CBLM for Classes IX and X, REC
- PPT

Chapter 5: Installing water pumps

A. Learning objectives/Broad theme/Strand/Chapter

Learning objectives	Core concepts (Chapters/Topics)
5.1.1. Explain the types of signs and symbols. 5.1.2. Explain the importance of referring to the drawing. 5.1.3. <i>Ensure good housekeeping practices.</i> 5.1.4. <i>Ensure correct interpretation of the drawing.</i> 5.1.5. <i>Ensure safe handling of drawing.</i>	5.1 Interpreting pump drawing

B. Competencies

- i) Interpret any pump drawing to perform the layout of the pump.

C. Pedagogy/Learning experience

• Contact:

- ✓ Lecture-based on sign and symbol of water pump
- ✓ Make learners go through the INFORMATION SHEET 5.1
- ✓ Share the web link <https://youtu.be/4iWR7IS3QZY> which explains parts of the pump.
- ✓ Make learners go through OPERATION SHEET 5.1.
- ✓ Demonstrate on OPERATION SHEET 5.1
- ✓ Provide guided practice on OPERATION SHEET 5.1

• Non-contact:

- ✓ Make learners go through the INFORMATION SHEET 5.1 of CBLM through Google Classroom.
- ✓ Provide PPT on sign and symbol of water pump through audiovisual.
- ✓ Share the web link <https://youtu.be/4iWR7IS3QZY> which explains parts of the water pump through Google Classroom.
- ✓ Make learners go through OPERATION SHEET 5.1

D. Assessment

• Contact:

- ✓ Make learners perform OPERATION SHEET 5.1 and keep on practicing while performing any task.
- ✓ Make learners answer the SAMPLE SELF CHECK 3.2 with additional questions.
- ✓ Assess learners' performance using a rubric.

• Non-contact:

- ✓ Make learners answer the SAMPLE SELF CHECK 3.2 with additional questions and send it through Google Classroom.
- ✓ Written test through Kahoot.
- ✓ Assess through oral/viva-voce

E. Resources (online and offline)

- CBLM, REC
- <https://youtu.be/4iWR7IS3QZY> (Explaining parts of pumps)

A. Learning objectives/Broad theme/Strand/Chapter

Learning objectives	Core concepts (Chapters/Topics)
5.2.1 Explain the Pythagoras theorem. 5.2.2 Explain the method of layout. 5.2.3 Prepare pump layout 5.2.4 <i>Ensure proper handling of tools and material.</i> 5.2.5 <i>Ensure appropriate use of hand gloves.</i>	5.2 Preparing pump layout

A. Competencies

- i) Prepare pump layout using 3,4,5, method.

B. Pedagogy/Learning experience

• Contact:

- ✓ Lecture on Pythagoras theorem.
- ✓ Make learners go through INFORMATION SHEET 5.2.
- ✓ Provide PPT on the method of layout
- ✓ Demonstrate on the OPERATION SHEET 5.2.
- ✓ Provide guided Practices.
- ✓ Let them practices individually.

• Non-contact:

- ✓ Make learners go through INFORMATION SHEET 5.2
- ✓ Make learners go through OPERATION SHEET 3.2
- ✓ Provide PPT on the method of layout through google classroom.

C. Assessment

• Contact:

- ✓ Make learners perform OPERATION SHEET 5.2 and assess them using a checklist/performance guide. Provide necessary intervention.
- ✓ Make learners solve the SAMPLE SELF CHECK 5.2
- ✓ Assess the learner's ability through conducting oral tests/ written tests.

• Non-contact:

- ✓ Make learners solve the SAMPLE SELF CHECK 5.2 and send it through Google Classroom.
- ✓ Frame questions using different sources and let the learners submit answers through Google Classroom or any other social media platforms.
- ✓ Written test through Kahoot.
- ✓ Assess through oral/viva-voce

D. Resources (online and offline)

- CBLM, REC
- PPT

A. Learning objectives/Broad theme/Strand/Chapter

Learning objectives	Core concepts (Chapters/Topics)
5.3.1 Explain the different types of foundations. 5.3.2 State the purpose of soiling. 5.3.3 State the difference between PCC and RCC. 5.3.4 Explain the application Bhutan schedule of Rate (BSR) and Bill of Quantities. (BOQ) 5.3.5 Perform stone soiling. 5.3.6 Perform concreting. 5.3.7 <i>Proper handling of tools and equipment.</i> 5.3.8 <i>Ensure appropriate use of BSR and BOQ.</i> 5.3.9 <i>Ensure appropriate use of hand gloves, a helmet, and an apron.</i>	5.3 Constructing pump base

B. Competencies

- i) Construct pump base for installation of any pump.

C. Pedagogy/Learning experience

- **Contact:**

- ✓ Make learners go through the INFORMATION SHEET 5.3.
- ✓ Provide handout on the difference between PCC and RCC
- ✓ Let the learners discuss in a group and do a presentation on the purpose of soiling using PPT, handouts.
- ✓ Make learners go through the OPERATION SHEET 5.3
- ✓ Demonstrate OPERATION SHEET 5.3 through guided practices.
- ✓ Arrange site visit.

- **Non-contact:**

- ✓ Make learners go through the INFORMATION SHEET 5.3
- ✓ Provide handout on the difference between PCC and RCC
- ✓ Provide handouts on the purpose of soiling, self-made tutorial video clips, and PPT through Google Classroom or any other relevant social media.
- ✓ Make learners go through SKILL SHEET 5.3
- ✓ Make learners go through OPERATION SHEET 5.3

D. Assessment

- **Contact:**

- ✓ Make learners read INFORMATION SHEET 5.3 and perform OPERATION SHEET 5.3 and assess them using a checklist/performance guide. Provide necessary intervention.
- ✓ Assess learner's knowledge about the application of BSR and BOQ by asking questions.
- ✓ Conduct class tests to assess their understanding.
- ✓ Let learners carry out activities of the SAMPLE SELF CHECK 5.3
- ✓ Let the learners do a presentation and assess as per the rubric developed.

- **Non-contact:**

- ✓ Make learners read INFORMATION SHEET 5.3 and perform OPERATION SHEET 5.3 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 5.3 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)

- CBLM, REC
- PPT
- Handouts

A. Learning objectives/Broad theme/Strand/Chapter

Learning objectives	Core concepts (Chapters/Topics)
5.4.1 Define water pump. 5.4.2 List the types of the water pump and their specifications. 5.4.3 Explain the function of the water pump. 5.4.4 Level the parts of the water pump. 5.4.5 State the working principle of the water pump. 5.4.6 List the advantages and disadvantages of pumps. 5.4.7 Explain the purpose of using a check/foot valve. 5.4.8 <i>Ensure proper handling of tools and equipment.</i> 5.4.9 <i>Ensure appropriate use of hand gloves, helmet, and safety belt</i>	5.4 Assembling pump accessories

B. Competencies

- i) Assemble a pump component that can deliver water to the required height.

C. Pedagogy/Learning experience

• Contact:

- ✓ Brainstorm of accessories of the pump
- ✓ Make learners read INFORMATION SHEET 5.4
- ✓ Provide handouts to learners.
- ✓ Make learners perform OPERATION SHEET 5.4
- ✓ Let the learners discuss in a group and do a presentation on the function of water pumps using PPT, handouts, demonstration, and short video clips to explain the function of the water pump.
- ✓ Arrange site visit.

• Non-contact:

- ✓ Instruct learners to read INFORMATION SHEET 5.4 through Google Classroom.
- ✓ Share the web link <https://youtu.be/DmJCDOTIDRY> which explains the parts of the water pump and the working principle of water pumps.
- ✓ Share the web link <https://youtu.be/wsm5zszsBI4s> which explains the types of pumps
- ✓ Provide handouts, self-made tutorial video clips, and PPT through Google Classroom or any other relevant social media.
- ✓ Instruct learners to go through OPERATION SHEET 5.4 through Google Classroom.

D. Assessment

- **Contact:**
 - ✓ Make learners read INFORMATION SHEET 5.4 and perform OPERATION SHEET 5.4 and assess them using a checklist/performance guide. Provide necessary intervention.
 - ✓ Assess learner's knowledge about types of the water pump and their specification by asking questions.
 - ✓ Conduct class tests to assess their understanding.
 - ✓ Let learners carry out activities of the SAMPLE SELF CHECK 5.4
 - ✓ Let the learners do the presentation and assess as per the rubric developed
- **Non-contact:**
 - ✓ Make learners read INFORMATION SHEET 5.4 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 5.4 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.
 - ✓ Written test through Kahoot.
 - ✓ Assess through oral/viva-voce

E. Resources (online and offline)

- CBLM, REC
- PPT
- <https://youtu.be/DmJCDOTIDRY> (Explanation on parts of the pump and working principle)
- <https://youtu.be/wsm5zzsBI4s> (Explanation on types of pumps)

A. Learning objectives/Broad theme/Strand/Chapter

Learning objectives	Core concepts (Chapters/Topics)
5.5.1 Explain the importance of priming. 5.5.2 Explain do's and don'ts for installing the pump. 5.5.3 Calculate head discharge. 5.5.4 State the causes of the problem in the water pump. 5.5.5 Prime the pump. 5.5.6 <i>Ensure proper handling of tools and equipment.</i>	5.5 Testing pump

B. Competencies

- i) Test pump to detect any leakage.

C. Pedagogy/Learning experience

- **Contact:**

- ✓ Lecture on dos and don'ts for installing the pump.
- ✓ Make learners read INFORMATION SHEET 5.5
- ✓ Provide handouts to learners.
- ✓ Make learners perform OPERATION SHEET 5.5
- ✓ Let the learners discuss in a group and do a presentation on head discharge using PPT, handouts, demonstration, and short video clips to explain the function of the water pump.

- **Non-contact:**

- ✓ Instruct learners to read INFORMATION SHEET 5.5 through Google Classroom.
- ✓ Share the web link <https://youtu.be/sOMI1N8ZiFo> which explains how to calculate discharge.
- ✓ Provide handouts, self-made tutorial video clips, and PPT through Google Classroom or any other relevant social media.
- ✓ Instruct learners to go through OPERATION SHEET 5.5 through Google Classroom.

D. Assessment

- **Contact:**

- ✓ Make learners read INFORMATION SHEET 5.5 and perform OPERATION SHEET 5.5 and assess them using a checklist/performance guide. Provide necessary intervention.
- ✓ Assess learner's knowledge about the calculation of head discharge by asking questions.
- ✓ Conduct class tests to assess their understanding.
- ✓ Let learners carry out activities of the SAMPLE SELF CHECK 5.5

✓ Let the learners do the presentation and assess as per the rubric developed

- **Non-contact:**

- ✓ Let the student solve SAMPLE SELF CHECK 5.5 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.

- ✓ Written test through Kahoot.

- ✓ Assess through oral/viva-voce

E. Resources (online and offline)

- CBLM, REC

- PPT

- Handout

- <https://youtu.be/sOMI1N8ZiFo> (Calculation of head discharge)

A. Learning objectives/Broad theme/Strand/Chapter

Chapter 6: Maintain internal domestic water supply system

Learning objectives	Core concepts (Chapters/Topics)
6.1.1 Explain the causes and remedies of pipeline faults. 6.1.2 List the different types of fault. 6.1.3 <i>Exhibit honesty.</i> 6.1.4 <i>Work in a team.</i> 6.1.5 <i>Ensure appropriate use of hand gloves, helmet, apron, and safety belt.</i>	6.1 Locating fault

B. Competencies:

- i) Locate fault in any pipelines.

C. Pedagogy/Learning Experiences

• Contact:

- ✓ Lecture on the different types of fault.
- ✓ Make learners read INFORMATION SHEET 6.1.
- ✓ Provide PPT on the causes and remedies of pipeline faults.
- ✓ Demonstrate on OPERATION SHEET 6.1
- ✓ Make learners read and perform OPERATION SHEET 6.1 through guided practice.
- ✓ Arrange site visit.

• Non-contact:

- ✓ Instruct learners to read INFORMATION SHEET 6.1 through Google Classroom.
- ✓ Provide handouts, self-made tutorial video clips, and PPT on the causes and remedies of pipeline faults through Google Classroom or any other relevant social media.
- ✓ Instruct learners to go through OPERATION SHEET 6.1 through Google Classroom.

D. Assessment:

• Contact:

- ✓ Make learners read INFORMATION SHEET 6.1 and perform OPERATION SHEET 6.1 and assess them using a checklist/performance guide. Provide necessary intervention.
- ✓ Assess learner's knowledge about causes and remedies of pipeline fault by asking questions.
- ✓ Conduct class tests to assess their understanding.
- ✓ Let learners carry out activities of the SAMPLE SELF CHECK 6.1
- ✓ Let the learners do the presentation and assess as per the rubric developed

- **Non-contact:**

- ✓ Let the student solve SAMPLE SELF CHECK 6.1 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.
- ✓ Written test through Kahoot.
- ✓ Assess through oral/viva-voce

E. **Resources (online and offline):**

- CBLM, REC
- Handout
- PPT

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

Learning objectives	Core concepts (Chapters/Topics)
6.2.1 Explain the purpose of maintenance. 6.2.2 List the types of material required for maintenance. 6.2.3 <i>Ensure proper handling tools, materials, and equipment.</i> 6.2.4 <i>Exhibit honesty</i>	6.2 Preparing of estimation and costing maintenance

B. Competencies

- i) Prepare estimation and cost of maintenance as required.

C. Pedagogy/Learning Experience

- **Contact:**
 - ✓ Lecture on the purpose of maintenance.
 - ✓ Make learners read INFORMATION SHEET 6.2
 - ✓ Provide PPT on types of material required for maintenance.
 - ✓ Demonstrate on OPERATION SHEET 6.2
 - ✓ Make learners read and perform OPERATION SHEET 6.2 through guided
- **Non-contact:**
 - ✓ Instruct learners to read INFORMATION SHEET 6.2 through Google Classroom.
 - ✓ Provide handouts, self-made tutorial video clips, and PPT on types of materials required for maintenance through Google Classroom or any other relevant social media.
 - ✓ Instruct learners to go through OPERATION SHEET 6.2 through Google Classroom.

D. Assessment:

- **Contact:**
 - ✓ Make learners read INFORMATION SHEET 6.2 and perform OPERATION SHEET 6.2 and assess them using a checklist/performance guide. Provide necessary intervention.
 - ✓ Assess learner's knowledge about types of materials required for maintenance by asking questions.
 - ✓ Conduct class tests to assess their understanding.
 - ✓ Let learners carry out activities of the SAMPLE SELF CHECK 6.2
 - ✓ Let the learners do the presentation and assess as per the rubric developed
- **Non-contact:**
 - ✓ Let the student solve SAMPLE SELF CHECK 6.2 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

- ✓ Written test through Kahoot.
- ✓ Assess through oral/viva-voce

E. Resources (online and offline):

- CBLM, REC

A. Learning objectives/Broad theme/Strand/Chapter

Learning objectives	Core concepts (Chapters/Topics)
6.3.1 Explain the causes of pipe blockage. 6.3.2 List the types of cleaning tools. 6.3.3 <i>Ensure proper handling tools, materials, and equipment</i> 6.3.4 <i>Ensure appropriate use of hand gloves, apron, and helmet</i>	6.3 Clear pipe blockage

B. Competencies

- i) Clear pipe blockage whenever there are blockages.

C. Pedagogy/Learning experience

- **Contact:**

- ✓ Lecture on causes of pipe blockage
- ✓ Make learners go through the INFORMATION SHEET 6.3
- ✓ Let the learners discuss in a group and do a presentation on the type of cleaning tools using PPT, handouts.
- ✓ Make learners go through the OPERATION SHEET 6.3
- ✓ Demonstrate OPERATION SHEET 6.3 through guided practices.

- **Non-contact:**

- ✓ Make learners go through the INFORMATION SHEET 6.3
- ✓ Provide handouts on types of cleaning tools and causes of pipe blockage, self-made tutorial video clips, and PPT through Google Classroom or any other relevant social media.
- ✓ Make learners go through SKILL SHEET 6.3
- ✓ Make learners go through OPERATION SHEET 6.3

D. Assessment

- **Contact:**

- ✓ Make learners read INFORMATION SHEET 6.3 and perform OPERATION SHEET 6.3 and assess them using a checklist/performance guide. Provide necessary intervention.
- ✓ Assess learner's knowledge about types of cleaning tools and causes of pipe blockage by asking questions.
- ✓ Conduct class tests to assess their understanding.
- ✓ Let learners carry out activities of the SAMPLE SELF CHECK 6.3
- ✓ Let the learners do the presentation and assess as per the rubric developed.

- **Non-contact:**
 - ✓ Let the student solve SAMPLE SELF CHECK 6.3 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.
 - ✓ Written test through Kahoot.
 - ✓ Assess through oral/viva-voce

E. Resources (online and offline)

- CBLM, REC
- PPT
- Handouts

A. Learning objectives/Broad theme/Strand/Chapter

Learning objectives	Core concepts (Chapters/Topics)
6.4.1 Explain the causes and remedies of defective pipelines 6.4.2 Explain the causes and remedies of defectives fittings 6.4.3 <i>Ensure proper handling tools, materials, and equipment</i> 6.4.4 <i>Ensure appropriate use of hand gloves, apron, and helmet</i>	6.4 Repairing defective pipes and fitting (CP fittings)

B. Competencies

- i) Repair defective pipe and fittings as required.

C. Pedagogy/Learning experience

- **Contact:**

- ✓ Lecture on causes and remedies of defective pipelines and fittings
- ✓ Make learners go through the INFORMATION SHEET 6.4.
- ✓ Let the learners discuss in a group and do a presentation on causes of defective pipelines and fittings using PPT, handouts.
- ✓ Make learners go through the OPERATION SHEET 6.4
- ✓ Demonstrate OPERATION SHEET 6.4 through guided practices.
- ✓ Arrange site visit.

- **Non-contact:**

- ✓ Make learners go through the INFORMATION SHEET 6.4
- ✓ Provide handouts on the purpose of soiling, self-made tutorial video clips, and PPT through Google Classroom or any other relevant social media.
- ✓ Share the web link <https://youtu.be/uEpAcBu-7w> which explains on repairing crake of the CPVC pipe.
- ✓ Make learners go through SKILL SHEET 6.4
- ✓ Make learners go through OPERATION SHEET 6.4

D. Assessment

- **Contact:**

- ✓ Make learners read INFORMATION SHEET 6.4 and perform OPERATION SHEET 6.4 and assess them using a checklist/performance guide. Provide necessary intervention.
- ✓ Assess learner's knowledge about causes of defective pipelines and fittings by asking questions.
- ✓ Conduct class tests to assess their understanding.

- ✓ Let learners carry out activities of the SAMPLE SELF CHECK 6.4
- ✓ Let the learners do the presentation and assess as per the rubric developed.

- **Non-contact:**

- ✓ Make learners read INFORMATION SHEET 6.4
- ✓ Let the student solve SAMPLE SELF CHECK 5.3 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.

- ✓ Written test through Kahoot.
- ✓ Assess through oral/viva-voce

E. Resources (online and offline)

- CBLM, REC
- PPT
- Handouts
- [https://youtu.be/uEpAcBu- 7w](https://youtu.be/uEpAcBu-7w) (Explanation of crack repairing)

RESOURCES

- 1) Technical and Vocational Education and Training (TVET) New Normal Curriculum Framework (Classes: PP-XII)
- 2) Competency-Based Learning Materials (Plumbing).