National School Curriculum

INSTRUCTIONAL GUIDE FOR TVET (MASONRY)

CLASSES XI & XII

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

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

- His Majesty Jigme Khesar Namgyel Wangchuck

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Foreword

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

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

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

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

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

Tashi Namgyel,

Director

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Introduction

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

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

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

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

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

Purpose of the Instructional Guide

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

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

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

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

activities, teachers need to ensure that the materials are relevant and appropriate for the given task.

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

Class XI

MODULE I: PERFORMING BRICK/BLOCK, STONE MASONRY AND PLASTERING

Chapter 4: Performing brick/blocks masonry work

A. Competency/Competencies:

i) Practice OHS procedure for safety as always.

ii) Provide seismic bands as per requirement.

B. Learning objectives/Topic:

Learning objectives	**Topic**
4.10.1 Define the seismic band. 4.10.2 List the types of seismic band. 4.10.3 State the purpose of seismic bands. 4.10.4 State the advantages and disadvantages of bands. 4.10.5 Explain the use of reinforcement concrete bands. 4.10.6 Explain the use of wooden bands. 4.10.7 Provide seismic bands. *4.10.8 Ensure appropriate use of gloves, helmet, apron, and goggles.* *4.10.9 Ensure the proper handling of tools.* *4.10.10 Ensure cleanliness at a workplace.* *4.10.11 Ensure proper storage of surplus materials.*	4.10 Providing seismic bands **Overview:** The learners can provide seismic bands besides knowing the types, purpose, advantages and disadvantages of seismic band, and explain the use of reinforcement concrete and wooden bands.

C. Learning Experiences:

- ✓ Make learners read the INFORMATION SHEET 4.10.
- ✓ Make learners read and perform the OPERATION SHEET 4.10 through demonstration and guided practice.
- ✓ Make learners answer the SAMPLE SELF CHECK 4.10 and provide additional questions.
- ✓ Instruct learners to read the INFORMATION SHEET 4.10 through Google Classroom.
- ✓ Instruct learners to watch a video on seismic bands and opening reinforcement in the web link https://youtu.be/CIzvf1HYX8Q through Google Classroom.
- ✓ Instruct learners to explore more about formwork by sharing the web link https://www.designingbuildings.co.uk/wiki/Formwork through Google Classroom.
- ✓ Ask learners to read the OPERATION SHEET 4.10 through Google Classroom.
- ✓ Instruct learners to answer the SAMPLE SELF CHECK 4.10 and provide additional questions and make them submit it through Google Classroom.

D. Assessment:

- ✓ Assess learners' ability to provide seismic band using a rubric.
- ✓ Assess learners' response to SAMPLE SELF CHECK 4.10 and the additional questions provided.
- ✓ Provide feedback.

- ✓ Assess learners' response to SAMPLE SELF CHECK 4.10 and the additional questions provided.
- ✓ Provide feedback through Google Classroom.

E. Resources:

- CBLM
- https://youtu.be/CIzvf1HYX8Q (Video on seismic bands and opening reinforcement)
- https://www.designingbuildings.co.uk/wiki/Formwork (Article on formwork)

A. Competency/Competencies:

i) Practice OHS procedure for safety as always.
ii) Lay confined masonry wall as required.

B. Learning objectives/Topic:

Learning objectives	Topic
4.11.1 Define confined masonry. 4.11.2 State the purpose of confined masonry. 4.11.3 Describe the structural components of a confined masonry building. 4.11.4 State the advantages and disadvantages of confine masonry. 4.11.5 Lay confined masonry wall. 4.11.6 *Ensure appropriate use of gloves, helmet, apron, and goggles.* 4.11.7 *Ensure the proper handling of tools.* 4.11.8 *Ensure cleanliness at a workplace.* 4.11.9 *Ensure economic use of materials.* 4.11.10 *Exhibit teamwork.* 4.11.11 *Ensure proper storage of surplus materials.*	**4.11** Laying confined masonry wall **Overview:** Information on confined masonry such as purpose, structural components, and its advantages and disadvantages are covered besides transferring the technique of laying confined masonry wall.

C. Learning Experiences:

- ✓ Make learners read the INFORMATION SHEET 4.11.
- ✓ Make learners read and perform OPERATION SHEET 4.11.
- ✓ Make learners answer the SAMPLE SELF CHECK 4.11.
- ✓ Make learners read the INFORMATION SHEET 4.11 and OPERATION SHEET 4.11 through Google Classroom.
- ✓ Make learners explore more about confined masonry wall by sharing a pdf link https://logementquartierhaiti.files.wordpress.com/2011/10/confined-masonry-training-pakistan.pdf through Google Classroom.
- ✓ Make learners watch a video on confined masonry by using the link https://youtu.be/fiT2vEOXsuw through Google Classroom.
- ✓ Instruct learners to answer the SAMPLE SELF CHECK 4.11 and submit it through Google Classroom.

D. Assessment:

- ✓ Assess learners' ability to lay confine masonry wall using a rubric.
- ✓ Assess learners' response to SAMPLE SELF CHECK 4.11 and the additional questions provided.
- ✓ Provide feedback.

- ✓ Assess learners' response to SAMPLE SELF CHECK 4.11.
- ✓ Provide feedback through Google Classroom.

E. Resources:

- ✓ CBLM
- ✓ https://logementquartierhaiti.files.wordpress.com/2011/10/confined-masonry-training-pakistan.pdf (Note on confined masonry wall)
- ✓ https://youtu.be/fiT2vEOXsuw (Video on confined masonry)

A. Competency/Competencies:

i) Practice OHS procedure for safety as always.

ii) Provide the different type of pointing as required.

B. Learning objectives/Topic:

Learning objectives	Topic
4.12.1 Define pointing. 4.12.2 List the types of tools and materials. 4.12.3 State the types of pointing and their function. 4.12.4 State the advantages of pointing over plastering. 4.12.5 Define curing. 4.12.6 State the purpose of curing. 4.12.7 State the methods of curing. 4.12.8 Describe the duration of curing. 4.12.9 Explain the effects of poor curing. 4.12.10 Provide pointing. 4.12.11 *Ensure proper use of pointing tools.* 4.12.12 *Ensure appropriate use of gloves, apron, and mask.*	**4.12** Providing pointing **Overview:** This topic covers information on pointings such as types of tools and materials required, types of pointing and their function, advantages of pointing over plastering besides knowing how to provide pointing. This topic also covers on curing such as purpose, methods, duration of curing and effects of poor curing.

C. Learning Experiences:

- ✓ Make learners read the INFORMATION SHEET 4.12.
- ✓ Make learners read and perform the OPERATION SHEET 4.12.
- ✓ Make learners solve the SAMPLE SELF CHECK 4.12 and provide additional questions
- ✓ Instruct learners to read the INFORMATION SHEET 4.12 and OPERATION SHEET 4.12 through Google Classroom.
- ✓ Instruct learners to watch a video showing the ways to do a pointing by sharing a link https://youtu.be/n0TqH0yret0 through Google Classroom.
- ✓ Instruct learners to watch a video on how curing is done by sharing a link https://youtu.be/T_wqwYPAie4 through Google Classroom.
- ✓ Instruct learners to solve the SAMPLE SELF CHECK 4.12 and provide additional questions and make them submit it through Google Classroom.

D. Assessment:

- ✓ Assess learners' ability to provide pointing by using a rubric.
- ✓ Assess learners' response to SAMPLE SELF CHECK 4.12 and the additional questions provided.
- ✓ Provide feedback.
- ✓ Assess learners' response to SAMPLE SELF CHECK 4.12 and the additional questions provided.
- ✓ Provide feedback.

E. Resources:

- CBLM
- https://youtu.be/n0TqH0yret0 (Video on pointing)
- https://youtu.be/T_wqwYPAie4 (Video on curing)

Chapter 5: Performing stone masonry work

A. Competency/Competencies:

i) Practice OHS procedure for safety as always.

ii) Dress the stone manually in the required shape and size.

B. Learning objectives/Topic:

Learning objectives	Topic
5.1.1 Define stone masonry. 5.1.2 State the uses of stone masonry. 5.1.3 State the classification of rock. 5.1.4 Describe the types of stone used in building construction. 5.1.5 Describe the quality and selection of stone. 5.1.6 Define stone dressing. 5.1.7 Explain the purpose of stone dressing. 5.1.8 List the tools used for stone dressing. 5.1.9 Dress stones manually. 5.1.10 *Ensure proper handling of dressing tools.* 5.1.11 *Ensure cleanliness at a workplace.* 5.1.12 *Ensure appropriate use of gloves, apron, goggles, and mask.*	**5.1** Dressing stones manually **Overview:** This topic covers various information on stone besides imparting the technique of dressing stones manually.

C. Learning Experiences:

- ✓ Make learners read the INFORMATION SHEET 5.1.
- ✓ Make learners read and perform the OPERATION SHEET 5.1.
- ✓ Ask learners to answer the questions given in the SAMPLE SELF CHECK 5.1 and provide additional questions.
- ✓ Instruct learners to read the INFORMATION SHEET 5.1 and OPERATION SHEET 5.1 through Google Classroom.
- ✓ Instruct learners to explore more about rocks by using the web link https://byjus.com/physics/types-of-rocks/ through Google Classroom.
- ✓ Instruct learners to watch a video on how stones are being dressed by sharing the web link https://youtu.be/lDz0Serm3eU through Google Classroom.
- ✓ Ask learners to solve SAMPLE SELF CHECK 5.1 and provide additional questions and instruct them to submit it through Google Classroom.

D. Assessment:

- ✓ Assess learners' ability to dress stone manually by using a rubric.
- ✓ Assess learners' response to SAMPLE SELF CHECK 5.1 and the additional questions provided.
- ✓ Provide feedback.
- ✓ Assess learners' response to SAMPLE SELF CHECK 5.1 and the additional questions provided.
- ✓ Provide feedback through Google Classroom.

E. Resources:

- CBLM
- https://byjus.com/physics/types-of-rocks/ (Notes and video on type of rocks)
- https://youtu.be/lDz0Serm3eU (Video on dressing stone manually)

A. Competency/Competencies:

i) Practice OHS procedure for safety as always.

ii) Dress stone using a cutting machine into a required shape and size.

B. Learning objectives/Topic:

Learning objectives	Topic
5.2.1 Label the parts of the stone cutting machine. 5.2.2 State the importance of pouring water while using a cutting machine. 5.2.3 Differentiate between manual and mechanical dressing. 5.2.4 Dress stone using a cutting machine. **5.2.5 *Operate cutting machine.*** 5.2.6 *Ensure the proper handling of the cutting machine.* 5.2.7 *Ensure cleanliness at a workplace.* 5.2.8 *Ensure appropriate use of gloves, apron, goggles, and mask.*	**5.2** Dressing stone using a cutting machine **Overview:** Before knowing how to dress stones using a cutting machine, the learners can know the parts of the machine, importance of pouring water while using machine, and differentiate between manual and mechanical dressing. A skill to operate cutting machine is also covered in this topic.

C. Learning Experiences:

- ✓ Make learners read the INFORMATION SHEET 5.2.
- ✓ Demonstrate to operate the cutting machine and exhibit how to dress stone using it.
- ✓ Make learners read and operate the SKILL SHEET 5.2.
- ✓ Make learners read and perform the OPERATION SHEET 5.2.
- ✓ Ask learners to answer the questions given in the SAMPLE SELF CHECK 5.2 and provide additional questions.
- ✓ Instruct learners to read the INFORMATION SHEET 5.2, SKILL SHEET 5.2 and OPERATION SHEET 5.2 through Google Classroom.
- ✓ Instruct learners to watch a video on how the stones cutter machine is being used by sharing the web link https://youtu.be/wBBlVnwV-y0 through Google Classroom.
- ✓ Ask learners to answer the questions given in the SAMPLE SELF CHECK 5.2 and provide additional questions and instruct them to submit them through Google Classroom.

D. Assessment:

- ✓ Assess learners' ability to dress stone using a cutting machine by using a rubric.
- ✓ Assess learners' response to SAMPLE SELF CHECK 5.2.
- ✓ Provide feedback.
- ✓ Assess learners' response to SAMPLE SELF CHECK 5.2.
- ✓ Provide feedback through Google Classroom.

E. Resources:

- CBLM
- https://youtu.be/wBBlVnwV-y0 (Video on stonecutter machine)

ENGINEERING DRAWING

A. Competency/Competencies:

i) Draw orthographic projection as per the standard procedures and dimensions.

B. Learning objectives/Topic

Learning objectives	Topic
2.2.1 Define orthographic drawing. 2.2.2 List the four quadrants. 2.2.3 Name the different ways of drawing orthographic projections. 2.2.4 Differentiate between first and third angle projection. 2.2.5 Draw orthographic projection. 2.2.6 *Ensure proper handling of drawing instruments.* 2.2.7 *Ensure proper disposal of waste.*	**2.2 Drawing orthographic projection** **Overview:** The learners can able to draw orthographic projection using the drawing techniques.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 2.2.
- ✓ Make learners read and perform OPERATION SHEET 2.2.
- ✓ Make learners solve the SAMPLE SELF CHECK 2.2 and provide additional questions on drawing an orthographic projection.
- ✓ Instruct learners read INFORMATION SHEET 2.2 through Google Classroom.
- ✓ Instruct learners to watch these videos to know the details of differences between the first angle and third angle projection by sharing the web links https://youtu.be/Gees6d2ANzs and https://youtu.be/sC8-IvJpBaA.
- ✓ Instruct learners to read and perform OPERATION SHEET 2.2 in A4 size paper and submit it through Google Classroom.
- ✓ Provide additional questions to draw orthographic projection along with letting learners solve SAMPLE SELF CHECK 2.2 and submit their work through Google Classroom.

D. Assessment:

- ✓ Assess learners' ability to perform OPERATION SHEET 2.2 on drawing an orthographic projection using a rubric.
- ✓ Assess learners' response to SAMPLE SELF CHECK 2.2 and the additional questions provided.
- ✓ Provide feedback.

- ✓ Assess learners' response to SAMPLE SELF CHECK 2.2 and the additional questions provided.
- ✓ Provide feedback through Google Classroom.

E. Resources:

- CBLM
- https://youtu.be/1sjaelzuGAk (Video on basics of orthographic projection)
- https://youtu.be/Gees6d2ANzs / https://youtu.be/sC8-IvJpBaA (Video on differences between the first angle and third angle projection)

A. Competency/Competencies:

i) Draw a building plan for different designs.

B. Learning objectives/Topic:

Learning objectives	Topic
2.3.1 Define building drawing. 2.3.2 List the types of building drawing. 2.3.3 Define the scale for drawing. 2.3.4 List the types of scale. 2.3.5 Draw a simple building plan. 2.3.6 ***Develop creativity through their simple drawing plan.*** 2.3.7 *Ensure proper handling of drawing instruments.* 2.3.8 *Ensure proper disposal of waste.*	**2.3** Drawing a simple building plan **Overview:** The learners can be able to draw a simple building plan using AutoCad software.

C. Learning Experiences:

- ✓ Make learners read INFORMATION SHEET 2.3.
- ✓ Make learners read and perform OPERATION SHEET 2.3.
- ✓ Make learners solve the SAMPLE SELF CHECK 2.3.
- ✓ Make learners design a simple drawing plan through their creativity.

- ✓ Instruct learners to read INFORMATION SHEET 2.3 through Google Classroom.
- ✓ Instruct learners to watch a video on the web link https://youtu.be/VYiVjVulnm4 that shows how to draw a floor plan.
- ✓ Instruct learners to read and perform OPERATION SHEET 2.3 in A4 size paper and submit it through Google Classroom.
- ✓ Instruct learners to solve the SAMPLE SELF CHECK 2.3 and submit it through Google Classroom.
- ✓ Make learners design a simple drawing plan through their creativity.

D. Assessment:

- ✓ Assess learners' ability to perform OPERATION SHEET 2.3 on providing dimension to drawing using a rubric.
- ✓ Assess learners' response to SAMPLE SELF CHECK 2.3.
- ✓ Assess learners' creativity in designing a simple drawing plan.
- ✓ Provide feedback.

- ✓ Assess learners' response to SAMPLE SELF CHECK 2.3.
- ✓ Assess learners' creativity in designing a simple drawing plan.
- ✓ Provide feedback through Google Classroom.

E. Resources:

- CBLM
- https://youtu.be/VYiVjVulnm4 (Video on how to draw a floor plan)

Class XII

MODULE I: PERFORMING BRICK/BLOCK, STONE MASONRY AND PLASTERING

Chapter 4: Performing brick/blocks masonry work

A. Competency/Competencies:

a. Practise OHS procedure for safety as always.
b. Construct different types of rubble masonry as required.

B. Learning objectives/Topic:

Learning objectives	Topic
5.3.1 State the technical terms used in stone masonry. 5.3.2 Describe the types of stone masonry. 5.3.3 Define RRM. 5.3.4 State the applications of the RRM wall. 5.3.5 State the reasons for providing through stones. 5.3.6 Differentiate between RRM wall & brick wall. 5.3.7 Estimate materials for RRM wall. 5.3.8 Lay RRM wall. 5.3.9 *Ensure proper care and handling of aligning tools.* 5.3.10 *Ensure cleanliness at the workplace.* 5.3.11 *Ensure economic use of materials.* 5.3.12 *Ensure proper storage of surplus materials.* 5.3.13 *Ensure appropriate use of gloves, apron, goggles, and mask.*	**5.3** Laying Random Rubble Masonry (RRM) wall **Overview:** Besides knowing the technical knowledge about Random Rubble Masonry (RRM) wall such as types, applications, differences between RRM wall and brick wall, and estimation of materials for RRM wall, the learners can able to lay RRM wall.

C. Learning Experiences:

- ✓ Make learners read the INFORMATION SHEET 5.3.
- ✓ Provide a few questions to estimate the quantity of materials required in a wall.
- ✓ Make learners read and perform the OPERATION SHEET 5.3 through guided practice.
- ✓ Make learners answer the SAMPLE SELF CHECK 5.3.
- ✓ Make learners answer the SAMPLE SELF CHECK 5.3 through Google Classroom.
- ✓ Instruct learners to read INFORMATION SHEET 5.3 and OPERATION SHEET 5.3 through Google Classroom.
- ✓ Provide a few questions to estimate the quantity of materials required in a wall through Google Classroom.
- ✓ Share a video that shows how to construct course rubble masonry by using a link https://youtu.be/kEDDMfmFoLY through Google Classroom.

D. Assessment:

- ✓ Assess learners' ability to construct the RRM wall.
- ✓ Assess learners' response to SAMPLE SELF CHECK 5.3.
- ✓ Provide feedback.
- ✓ Assess learners' response to SAMPLE SELF CHECK 5.3.
- ✓ Provide feedback through Google Classroom.

E. Resources:

- CBLM
- https://youtu.be/kEDDMfmFoLY (Video on construction of coursed rubble masonry)

A. Competency/Competencies:

i) Practice OHS procedure for safety as always.

ii) Construct the DRM wall as required.

B. Learning objectives/Topic:

Learning objectives	Topic
5.4.1 Define the DRM wall. 5.4.2 List the advantages and disadvantages of the DRM wall. 5.4.3 Estimate material for DRM wall. 5.4.4 State the application of the DRM wall. 5.4.5 Lay the DRM wall. 5.4.6 *Ensure proper care and handling of aligning tools.* 5.4.7 *Ensure cleanliness at the workplace.* 5.4.8 *Ensure economic use of materials.* 5.4.9 *Ensure proper storage of surplus materials.* 5.4.10 *Ensure appropriate use of gloves, apron, goggles, and mask.*	**5.4** Laying Dry Rubble Masonry (DRM) wall **Overview:** This topic consists the information on Dry Rubble Masonry (DRM) wall such as the advantages and disadvantages, estimation of materials and application of the DRM wall and also practical knowledge on laying DRM wall.

C. Learning Experiences:

- ✓ Make learners read the INFORMATION SHEET 5.4.
- ✓ Provide a few questions to practice the estimation of required material for the DRM wall.
- ✓ Make learners read and perform the OPERATION SHEET 5.4.
- ✓ Make learners solve the SAMPLE SELF CHECK 5.4.
- ✓ Make learners read the INFORMATION SHEET 5.4 and OPERATION SHEET 5.4 through Google Classroom.
- ✓ Provide a few questions to practice the estimation of required material for the DRM wall through Google Classroom.
- ✓ Share the video weblink https://youtu.be/mtQChQXKrkA that shows the laying of dry rubble masonry wall through Google Classroom.
- ✓ Instruct learners to solve the SAMPLE SELF CHECK 5.4 and submit their work through Google Classroom.

D. Assessment:

- ✓ Assess learners' ability to construct a DRM wall using a rubric.
- ✓ Assess learners' response to SAMPLE SELF CHECK 5.4.
- ✓ Provide feedback.
- ✓ Assess learners' response to SAMPLE SELF CHECK 5.4.
- ✓ Provide feedback through Google Classroom.

E. Resources:

- CBLM
- https://youtu.be/mtQChQXKrkA (Video on dry rubble masonry wall)

A. Competency/Competencies:

i) Practise OHS procedure for safety as always.

ii) Lay Ashlar masonry wall as per the requirement.

B. Learning objectives/Topic:

Learning objectives	Topic
5.5.1 Define ashlar masonry. 5.5.2 Describe the types of ashlar masonry. 5.5.3 Differentiate between RRM and ashlar masonry. 5.5.4 State the application of ashlar masonry. 5.5.5 Lay ashlar masonry wall. 5.5.6 *Ensure proper care and handling of aligning tools.* 5.5.7 *Ensure appropriate use of gloves, apron, goggles, and mask.*	**5.5** Laying ashlar masonry wall **Overview:** This topic covers the knowledege on important aspects of ashlar masonry wall and learners can lay ashlar masonry wall fulfilling the right procedure.

C. Learning Experiences:

- ✓ Make learners read the INFORMATION SHEET 5.5.
- ✓ Make learners read and perform the OPERATION SHEET 5.5.
- ✓ Make learners solve the SAMPLE SELF CHECK 5.5.
- ✓ Instruct learners to read the INFORMATION SHEET 5.5 and OPERATION SHEET 5.5 through Google Classroom.
- ✓ Instruct learners to learn the difference between rubble and ashlar masonry by sharing the web link https://youtu.be/C4LZ2TFAlHw through Google Classroom.
- ✓ Instruct learners to explore about types of ashlar masonry and its advantage by sharing the web link https://www.civilclick.com/ashlar-masonry/ through Google Classroom.
- ✓ Instruct learners to solve the SAMPLE SELF CHECK 5.5 and submit it through Google Classroom.

D. Assessment:

- ✓ Assess learners' ability to lay ashlar masonry using a rubric.
- ✓ Assess learners' response to SAMPLE SELF CHECK 5.5.
- ✓ Provide feedback.
- ✓ Assess learners' response to SAMPLE SELF CHECK 5.5.
- ✓ Provide feedback through Google Classroom.

E. Resources:

- CBLM
- https://youtu.be/C4LZ2TFAlHw (Rubble masonry vs Ashlar masonry)
- https://www.civilclick.com/ashlar-masonry/ (Ashlar masonry and its advantage)

A. Competency/Competencies:

i) Practice OHS procedure for safety as always.

ii) Lay different types of retaining wall as required.

B. Learning objectives/Topic:

Learning objectives	Topic
5.6.1 Define retaining. 5.6.2 State the purpose of retaining the wall. 5.6.3 List the types of retaining wall and their applications. 5.6.4 Explain the reason for providing weep holes. 5.6.5 Interpret the drawing and specifications. 5.6.6 Explain the technique for preparing a wooden profile. 5.6.7 Lay retaining wall. 5.6.8 *Ensure proper use of aligning tools.* 5.6.9 *Ensure appropriate use of gloves, apron, goggles, and mask.*	**5.6** Laying retaining wall **Overview:** Before laying retaining wall, a learner has the information such as purpose and types of retaining wall, reason for providing weep holes, and technique for preparing a wooden profile.

C. Learning Experiences:

- ✓ Make learners read the INFORMATION SHEET 5.6.
- ✓ Make learners read the OPERATION SHEET 5.6.
- ✓ Make learners solve the SAMPLE SELF CHECK 5.6.
- ✓ Conduct a class test on different types of stone walls.
- ✓ Make learners read the INFORMATION SHEET 5.6 and OPERATION SHEET 5.6.
- ✓ Let learners explore the retaining wall and make a note on it by sharing the link https://theconstructor.org/geotechnical/retaining-wall-types-use/24566/ and submit it through Google Classroom.
- ✓ Share learners the video link https://youtu.be/elW_nNO19Xo to watch how retaining walls are built.
- ✓ Instruct learners to solve the SAMPLE SELF CHECK 5.6 and submit it through Google Classroom.
- ✓ Conduct a class test through Google Classroom on different types of stone walls within a time-bound.

D. Assessment:

- ✓ Assess learners' ability to lay ashlar masonry using a rubric.
- ✓ Assess learners' response to SAMPLE SELF CHECK 5.6.
- ✓ Provide feedback.
- ✓ Assess learners' response to SAMPLE SELF CHECK 5.6.
- ✓ Provide feedback through Google Classroom.

E. Resources:

- CBLM
- https://theconstructor.org/geotechnical/retaining-wall-types-use/24566/ (Note on retaining wall)
- https://youtu.be/elW_nNO19Xo (Video on retaining wall)

A. Competency/Competencies:

i) Practice OHS procedure for safety as always.

ii) Repair the different types of masonry defects as per requirement.

B. Learning objectives/Topic:

Learning objectives	Topic
5.7.1 State the types of defects. 5.7.2 Explain the causes of defects. 5.7.3 Describe the remedies for defects. 5.7.4 Repair brick, block and stone masonry works. 5.7.5 *Ensure proper use of repairing tools.* 5.7.6 *Ensure appropriate use of gloves, apron, goggles, and mask.*	**5.7** Repairing brick, block and stone masonry works **Overview:** Apart from having the information on types of defects, causes of defects, and the remedies for defects, the learners can able to repair brick, block, and stone masonry works.

C. Learning Experiences:

- ✓ Make learners read the INFORMATION SHEET 5.7.
- ✓ Make learners read and perform the OPERATION SHEET 5.7.
- ✓ Go around the school and repair the damaged structures related to masonry.
- ✓ Ask learners to solve the SAMPLE SELF CHECK 5.7.
- ✓ Make learners read the INFORMATION SHEET 5.7 and OPERATION SHEET 5.7.
- ✓ Share learners the web link https://youtu.be/s-ooKCI-cFc to watch how old brick walls are repaired through Google Classroom.
- ✓ Ask learners to solve the SAMPLE SELF CHECK 5.7 and submit it through Google Classroom.

D. Assessment:

- ✓ Assess learners' ability to repair the damaged structures using a rubric.
- ✓ Assess learners' response to SAMPLE SELF CHECK 5.7.
- ✓ Provide feedback.
- ✓ Assess learners' response to SAMPLE SELF CHECK 5.7.
- ✓ Provide feedback through Google Classroom.

E. Resources:

- CBLM
- https://youtu.be/s-ooKCI-cFc (Video on repairing old brick wall)

RESOURCES

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