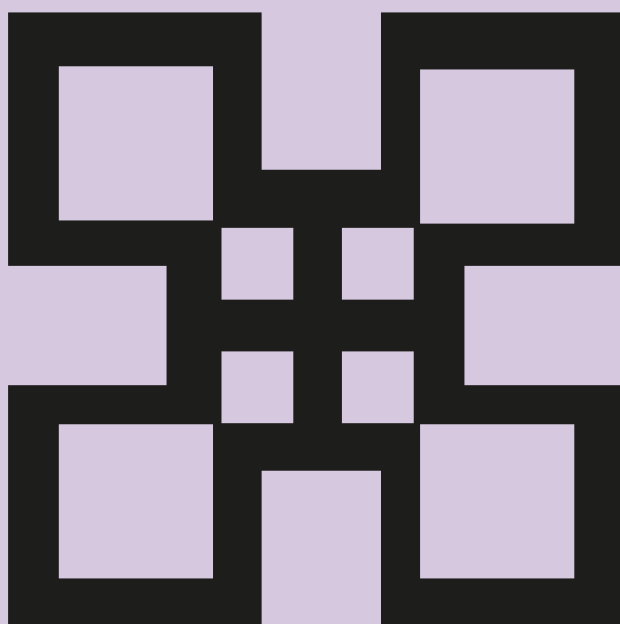


Professional Learning Community Handbook

# Manufacturing Engineering

Year Two



Ghana Education  
Service (GES)



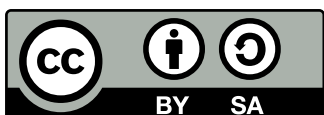
**Professional Learning  
Community Handbook**

# **Manufacturing Engineering**

**Year Two**



REPUBLIC OF GHANA



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# Foreword

As Minister for Education, I am delighted to introduce this handbook on Professional Learning Communities (PLCs). The handbook provides practical guidance and resources for teachers to establish and sustain effective PLCs that will drive quality pedagogy and enhance learning outcomes.

Weekly Professional Learning Community (PLC) sessions are the backbone of this Government's commitment to continuous teacher development in every Senior High School. These PLC sessions enable teachers to come together to master the pedagogy, content and assessment needed to successfully implement Ghana's SHS curriculum.

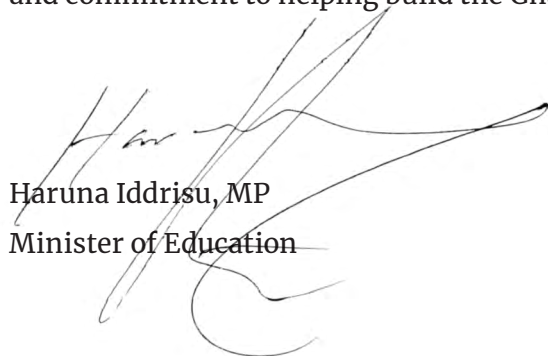
By fostering a culture of collaboration and continuous improvement through PLCs, teachers can enhance their understanding of the new SHS curriculum and effectively facilitate learning in the classroom. This will contribute to our country's resetting agenda by educating a generation of young people with the skills needed to progress to further studies, the world of work and adult life.

PLC sessions are critically important and should be treated with the utmost seriousness. Transforming our education system is a partnership between government, teachers, parents and learners. As teachers gain experience with the new curriculum and assessment regime, PLC sessions can also be tailored to discuss specific issues of concern as a group. It is important that teachers are heard and respected. We have listened to your concerns about PLCs and have factored this feedback into the new Year 2 Subject-Specific PLC Handbooks.

The Handbooks have been designed to be more flexible in structure than those for Year One. Each PLC Handbook is supported by a Subject-Specific App developed by the National Council for Curriculum and Assessment (NaCCA) linked to the revised curriculum. These Apps will help teachers to plan learning activities, assessments and differentiated learning. From our early interactions with teachers to develop and test these Apps we can see the level of excitement about their potential to save teachers time and improve their teaching and learning. These Ghanaian-owned Apps are the first of their kind at this scale anywhere in Africa, helping teachers save time and deliver lessons that truly meet the needs of every learner. I am confident that it will have a significant impact on our education system and ultimately benefit our students, teachers, and communities. All teachers are encouraged to embrace the principles and

practices outlined in this handbook and to work together to build strong, vibrant PLCs that promote enhanced learning outcomes.

I commend the authors and contributors for their tireless efforts in developing this valuable resource, which will enhance the quality of teaching and learning. Thank you to each one of you for your dedication and commitment to helping build the Ghana we want, together.

A handwritten signature in black ink, appearing to read 'Haruna', with a large, sweeping flourish extending to the right.

Haruna Iddrisu, MP  
Minister of Education

# Acknowledgements

Special thanks to Professor Samuel Ofori Bekoe, Director-General of the National Council for Curriculum and Assessment (NaCCA) and all who contributed to the successful writing of the Year Two Professional Learning Community Handbook.

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## Links to APPs

Year One App



<https://www.playlab.ai/project/cmd956fi407z6jiouhfnsy5mg>

Year Two App



<https://www.playlab.ai/project/cmekgvwwq0bnvkrou15qr23fo>



# PLC Session 0: Introduction to the Year Two Professional Learning Community Handbook and the Subject Specific App

## 1.0 Introduction and Purpose of the Handbook (15 minutes)

The purpose of the Year Two Professional Learning Community (PLC) Handbook is to support teachers to effectively deliver the new Senior High School (SHS) curriculum. This Handbook is accompanied by a Subject Specific App tailored to SHS curriculum. The App is designed to assist teachers with lesson planning, delivery and assessment. The Subject Specific App uses information directly from the following materials:

1. Curriculum
2. Teacher Manual
3. Learner Materials
4. Vision and Philosophy of the SHS curriculum
5. 21<sup>st</sup> century skills and competencies
6. National Teachers' Standards
7. West African Examinations Council (WAEC) Scheme of Assessment and Detailed Syllabus
8. Learning Planning Template
9. Teacher Assessment Manual and Toolkit
10. Socio Emotional Learning
11. National Values
12. Gender Equality and Social Inclusion (GESI), etc.

**Learning Outcome (LO):** To explore how the Subject Specific App can assist teachers with lesson planning, delivery and assessment (NTS 2b, 2c, 2e, 2f, 3a, 3d, 3e, 3g-3k and 3o).

**Learning Indicator (LI) 1:** Use the Subject Specific App to explore the Year Two Curriculum Materials (Teacher Manual and Learner Materials)

**Learning Indicator (LI) 2:** Discuss the advantages and disadvantages of using the Subject Specific App to design lessons and assessment strategies.

## 2.0 Exploring the Subject Specific App (65 minutes)

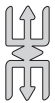
**2.1** Scan the QR Code or use the link to access your Subject Specific App– <https://www.playlab.ai/project/cmekgvwwqobnvkrou15qr23fo>



**2.2** Have a chat with the Subject Specific App (NTS 3j).

*E.g.*

- a. *Select a section and the number of lessons you have in a week to start the App*
- b. *Provide information about your class. For instance, the number of learners in your class, etc.*
- c. *Select a week you are interested in and continue chatting with your App*
- d. *Refer to your Teacher Manual and confirm the information provided by the App or otherwise*



### Note

Always refer to your Teacher Manual to confirm the information the App provides.

**2.3** Explore the following key areas using the App (NTS 2b, 2c, 2e and 3a–3q)

*E.g.*

**a. Learning activities**

*I have a 60-minute lesson in a rural farming community in Lawra without enough tables and chairs. I can have my lesson outside the classroom if possible.*

**b. Assessments**

*Based on the recommended assessments for the week how can I assess my learners at level 2 at the end of the lesson. I want to give one question during the lesson and one at the end as homework*

**c. Differentiation strategies**

*There are two learners in wheelchairs. Another one cannot hear unless you speak very loudly. Finally, 5 learners are comfortable in the local language than in English. How can they be catered for in the lesson and assessment?*

**Hint**



*Remember to ask your App to help you add 21<sup>st</sup> Century Skills, National Values, GESI and SEL to your learning activities, assessment, etc., where applicable.*

- 2.4** Share your experience with the larger group (NTS 3j).
- two things you learnt using the App and how you plan to apply them.
  - two advantages of using the App
  - two disadvantages of using the App without the appropriate curriculum materials (e.g. Teacher Manual, etc.)

## **3.0 Reflection**

- 3.1** Reflect and share your views on the session (NTS1a, 1b).
- 3.2** Remember to read PLC Session 0.5 and bring along your laptop in preparation for next week's session.

# PLC SESSION 0.5: Using the Subject Specific App to deliver assessments at appropriate DoK levels

## 1.0 Introduction (10 minutes)

### 1.1 Read and discuss the purpose, Learning Outcome (LO) and Learning Indicators (LIs) for the session

**Purpose:** The purpose of this session is to refresh our knowledge and understanding of assessment in the SHS curriculum. WAEC's visits to schools show that teachers are generally doing well with setting assessment tasks at DoK Levels 1 and 2 but there are issues with Levels 3 and 4. This session will look at how the subject specific App can assist teachers in developing assessments at all DoK Levels.

**Learning Outcome (LO):** To strengthen teachers' skills and competencies in developing assessment tasks and items to reflect all the DoK Levels (NTS 3k, 3o-3p).

**Learning Indicator (LI) 1:** Use the subject specific App to develop assessments linked to the learning indicators and the required DoK levels.

**Learning Indicator (LI) 2:** Use the subject specific App to review existing assessments to check whether they are linked to the required Learning Indicators and DoK levels.

## 2.0 Planning and Delivering of Assessment using the Subject Specific App (65 minutes)

### 2.1 Open your App and have a chat with it.

*E.g.*

- a. *Select a section and the number of lessons you have in a week to start the App*
- b. *Provide information about your class. For instance, the number of learners in your class, etc.*

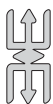
- c. *Select a week you are interested in and continue chatting with your App*
- d. *Refer to your Teacher Manual and confirm the information provided by the App or otherwise.*

## 2.2 Explore assessment using the App (NTS 3h, 3j, and 3o–3q)

*E.g.*

### Select Assessment

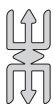
- a. *Look at the LIs for the week and select the appropriate DoK Level or Levels required for the week's lesson. For instance, 'the LI requires modelling, I would like to assess at level 3'*
- b. *Review the responses on the formats from your App, select any that meets your needs or continue chatting with your App to provide other assessment formats.*
- c. *Continue chatting with your App, for instance*
  - i. *'suggest 10 scenario based MCQs'*
  - ii. *'suggest level 3 task taking into consideration the learning activities and differentiation'*
  - iii. *Generate marking scheme for the task and add an explanation why an option is the right answer*



### Note

*Check that the MCQs are arranged alphabetically, vertically and the options are of similar length*

- d. *Now repeat the process for different assessment strategies, for instance*
  - i. *Essay questions at level 3*
  - ii. *Case study questions at level 4*
  - iii. *3-week project task at level 4, etc.*



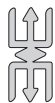
### Note

*You may select a different section or week for Activity 2.2d*

## 2.3 Use the subject specific App to review the task or items you developed by having a chat with the App to provide justifications as to why the task is at DoK level 3 or 4 (NTS 3j, 3k, 3m, 3o and 3p–3q).

*E.g.*

*Explain why the tasks or items are at DoK level 3.*

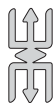


**Note**

*You may repeat this for DoK levels 1, 2 or 4.*

### 3.0 Using your subject specific App to explore one of the key assessment modes

- 3.1** Identify and select an assessment mode you found challenging in the last academic year and explore with your subject specific App how to use this assessment strategy effectively in your lesson delivery (NTS 3k).



**Note**

- i. *Chatting once may not be enough for the App to provide all that you may need for the tasks.*
- ii. *Chat with your App to learn how to integrate National Values, GESI, SEL and 21<sup>st</sup> century skills in your assessment task, rubrics/mark scheme and how to score them appropriately*

- 3.2** Share your experience with the larger group (NTS 3j).
- a. two things you learnt using the App in developing assessments
  - b. how you plan to apply the experiences
  - c. any challenges you faced in using the App to develop assessments and how you addressed them

### 4.0 Reflection (15 minutes)

- 4.1** Reflect and share your views on the session (NTS 1a, 1b)

- 4.2** Remember to

- a. read PLC Session 1, Teacher Manual and related Learner Material (NTS 3a).
- b. bring along your laptop, Teacher Manual and PLC Handbook on Week 1 in preparation for the next session (NTS 3a).

# PLC Session 1: Classification by chemical properties

## 1.0 Introduction (10 minutes)

Read and discuss the purpose, Learning Outcome (LO) and Learning Indicators (LIs) for the session.

**Purpose:** The purpose of this session is to populate a learning planner for Week 1 on *classification by chemical properties with the needed areas* using the subject-specific App to review the completed learning plan.

**Learning Outcome (LO):** To populate the learning planner on classification by chemical properties with essential questions, key notes on differentiation, learning activities and key assessments and to use the subject-specific App to review your populated learning plan (NTS 2b, 2c, 2e, 2f, 3a, 3d, 3e, 3g-3k and 3o).

**Learning Indicator (LI) 1:** Populate the learning planner on week classification by chemical properties using the subject specific App.

**Learning Indicator (LI) 2:** Enact an activity based on your learning plan.

## 2.0 Planning and Reviewing of Learning Plan (50 minutes)

- 2.1** Refer to your Teacher Manual and have a chat with your subject-specific App to develop your learning plan for Week 1 on classification by chemical properties (NTS 3a-3q).

*E.g.*

**i. Learning activities**

*Using the teacher manual as a reference, design interactive learning activities that enable learners to classify materials such as metals, ceramics, and polymers based on their chemical properties through hands-on investigations and real-world examples.*

**ii. Assessment tasks**

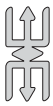
*Design assessment tasks that help learners understand how chemical properties influence the classification of materials and their applications in manufacturing.*

**iii. Differentiation**

*Develop differentiation strategies to support learners with different science backgrounds in understanding chemical bonding concepts and material classification systems*

**iv. Essential questions**

*Create 5 essential questions that engage learners in understanding how chemical properties influence material selection in manufacturing processes*



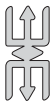
**Note**

- i. Chatting once may not be enough for the App to provide all that you may need for the tasks.
- ii. Transfer the information from your SS App into your learning planner template to complete your plans. Click the link or scan the QR code to download the template.  
<https://curriculumresources.edu.gh/wp-content/uploads/2025/09/Year-Two-Lesson-Planner-Template-20.docx>



### 3.0 Enactment (20 minutes)

- 3.1 Enact a teaching activity in your plan (NTS 1b, 1f, 1g, 2c, 2e, 2f and 3c-3j).
- 3.2 Reflect on the activity enacted to improve lesson delivery (NTS 1a).
- 3.3 Ask for feedback on the activity enacted (NTS 1a, 1e, 2c and 3o).



**Note**

*You may record the enacted activity.*

### 4.0 Reflection (10 minutes)

- 4.1 Reflect and share your views on the session (NTS 1a, 1b).
- 4.2 Identify a critical friend to observe your lesson in relation to PLC Session 1 to provide feedback on your lesson (NTS 1f, 1g).

**4.3** Remember to:

- a.** read PLC Session 2, Teacher Manual and related Learner Material (NTS 3a).
- b.** bring along your laptop, Teacher Manual and PLC Handbook in preparation for the next session (NTS 3a).
- c.** identify areas you found challenging in your teaching for discussion during the next session.

# PLC Session 2: Preparing for Student Transcript Portal Assessment – Portfolio

## 1.0 Introduction (10 minutes)

- 1.1 Share one thing on assessment in PLC Session 1 that you
  - a. applied in your lesson delivery
  - b. found challenging and how you addressed it.
- 1.2 Share one challenge you encountered while populating your learning plan for week 2 before the session that you would like to discuss during this PLC session.
- 1.3 Read and discuss the Purpose, Learning Outcome (LO) and Learning Indicators (LIs) for the session.

**Purpose:** The purpose of this session is to use the subject-specific App to

1. review the completed learning plan for week 2
2. prepare assessment tasks and rubrics for portfolio

**Learning Outcome (LO):** To review the learning plan for week 2 and address any challenges in planning and developing assessment tasks for the portfolio (NTS 2b, 2c, 2e, 2f, 3a, 3d, 3e, 3g–3k and 3o).

**Learning Indicator (LI) 1:** Review the learning plan and address challenges in the preparation and delivery of a lesson.

**Learning Indicator (LI) 2:** Discuss, develop and review assessment tasks with rubrics for the portfolio.

## 2.0 Reviewing the Learning Plan (20 minutes)

- 2.1 Upload your completed learning plan into the subject-specific App. Have a chat with your App to verify the following and discuss their suitability to reflect the diverse needs of learners in your class (NTS 1a, 2b, 2c and 3e–3q).

*E.g.*

### **Learning activities**

*Review the learning activities to match the recommended pedagogies to help learners with varied proficiency levels, considering that the school lacks projectors and ICT tools.*

#### **Hint**



Continue chatting with your App to verify the following and use the responses to complete your plan

- a. essential questions
- b. differentiation
- c. assessment tasks, etc.

## **3.0 Prepare to Assign, Assess and Record for the Student Transcript Portal (50 minutes)**

- 3.1** Refer to your Teacher Manual for the key assessment to be recorded in the Student Transcript Portal and have a chat with the subject-specific App to review or develop your assessment tasks and mark schemes/rubrics (NTS 2a–2c, 2e–2h and 3j–3q).

*E.g.*

*Referencing Appendix A of the Teacher Manual, create a portfolio assessment task for learners. Include rubrics for grading the task, as well as guidelines for administering the task and providing feedback to the learners.*



#### **Note**

One chat may not be enough for the App to provide all that you may need for the tasks

- 3.2** Have a chat with your App to verify the suggested assessment tasks and discuss the suitability of the responses from activity 3.1. Use the suggestions to refine the assessment tasks (NTS 1a, 2b, 2c and 3e–3q). In doing this activity, consider:

*E.g.*

#### **i. Task**

*Review portfolio assessment tasks to guide learners to complete the task by Week 22.*

**ii. Mark scheme and score distribution**

*Review the rubrics to offer clear guidance for grading learners' responses.*

**iii. Resources needed for assessment administration**

*Suggest any special resources learners will need to complete their portfolios*

**iv. How to provide feedback**

*Give feedback guidelines to be given to learners during and after the assessment*

## **4.0 Reflection (10 minutes)**

**4.1** Reflect and share your views on the session (NTS 1a, 1b).

**4.2** Identify a colleague to observe your lesson in relation to PLC Session 2 to provide feedback on your lesson (NTS 1f, 1g).

**4.3** Remember to:

- a.** mark, record and upload your learners' assessment scores in the Student Transcript Portal (NTS 3j, 3n).
- b.** read PLC Session 3, Teacher Manual and related Learner Material (NTS 3a).
- c.** bring along your laptop, Teacher Manual and PLC Handbook in preparation for the next session (NTS 3a).
- d.** identify areas you found challenging in your teaching and administration of the assessment for discussion during the next session.

# PLC Session 3: Preparing for Student Transcript Portal Assessment – Group Project

## 1.0 Introduction (10 minutes)

- 1.1 Share one thing on assessment in PLC Session 2 that you
  - a. applied in your lesson delivery
  - b. found challenging and how you addressed it.
- 1.2 Share one challenge you encountered while populating your learning plan for week 3 before the session that you would like to discuss during this PLC session.
- 1.3 Read and discuss the Purpose, Learning Outcome (LO) and Learning Indicators (LIs) for the session.

**Purpose:** The purpose of this session is to use the subject-specific App to

- 1. review the completed learning plan for week 3
- 2. prepare assessment tasks and rubrics for group project

**Learning Outcome (LO):** To review the learning plan for week 3 and address any challenges in planning and developing assessment tasks for the group project (NTS 2b, 2c, 2e, 2f, 3a, 3d, 3e, 3g-3k and 3o).

**Learning Indicator (LI) 1:** Review the learning plan and address challenges in the preparation and delivery of a lesson.

**Learning Indicator (LI) 2:** Discuss, develop and review assessment tasks with rubrics for the group project.

## 2.0 Reviewing the Learning Plan (20 minutes)

- 2.1 Upload your completed learning plan into the subject-specific App. Have a chat with your App to verify the following and discuss their suitability to reflect the diverse needs of learners in your class (NTS 1a, 2b, 2c and 3e-3q).

*E.g.*

### **Essential questions**

*Review the essential questions in the learning plan to ensure the learning activities and pedagogies align with the teaching and learning process, effectively achieving the learning outcomes.*

#### **Hint**



Continue chatting with your App to verify the following and use the responses to complete your plan

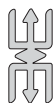
- a. assessment tasks
- b. differentiation
- c. Learning activities, etc.

## **3.0 Prepare to Assign, Assess and Record for the Student Transcript Portal (50 minutes)**

- 3.1** Refer to your Teacher Manual for the key assessment to be recorded in the Student Transcript Portal and have a chat with the subject-specific App to review or develop your assessment tasks and mark schemes/rubrics (NTS 2a–2c, 2e–2h and 3j–3q).

*E.g.*

*Referencing Appendix B of the Teacher Manual, create a group project assessment task to assign to learners. Provide rubrics for grading this task. Additionally, suggest guidelines for administering the task and offering feedback to learners.*



#### **Note**

One chat may not be enough for the App to provide all that you may need for the tasks

- 3.2** Have a chat with your App to verify the suggested assessment tasks and discuss the suitability of the responses from activity 3.1. Use the suggestions to refine the assessment tasks (NTS 1a, 2b, 2c and 3e–3q). In doing this activity, consider:

*E.g.*

**i. Task**

*Revise learning tasks to guide learners to complete the group project by Week 20, etc.*

**ii. Mark scheme and score distribution**

*Review the rubrics to provide clear guidance for grading learner responses, etc.*

**iii. Resources needed for assessment administration**

*Suggest resources needed to administer the group project effectively, etc.*

**iv. How to provide feedback**

*Review the feedback guidelines outlined in the learning plan to adequately provide feedback to learners after the project, etc.*

## **4.0 Reflection (10 minutes)**

**4.1** Reflect and share your views on the session (NTS 1a, 1b).

**4.2** Identify a colleague to observe your lesson in relation to PLC Session 3 to provide feedback on your lesson (NTS 1f, 1g).

**4.3** Remember to:

- a.** mark, record and upload your learners' assessment scores in the Student Transcript Portal (NTS 3j, 3n).
- b.** read PLC Session 4, Teacher Manual and related Learner Material (NTS 3a).
- c.** bring along your laptop, Teacher Manual and PLC Handbook in preparation for the next session (NTS 3a).
- d.** identify areas you found challenging in your teaching and administration of the assessment for discussion during the next session.

# PLC Session 4: Grouping of materials according to their synthesis

## 1.0 Introduction (5 minutes)

- 1.1 Share one thing you applied in your classroom based on PLC Session 3
  - a. the challenges you faced
  - b. how you addressed them
- 1.2 Have you developed your learning plan for week 4?
  - a. If you answered **yes**, conduct your PLC Session from Activity 2.0B
  - b. If you answered **no**, conduct your PLC Session from Activity 2.0A

### Hint



You cannot conduct PLC on Activity 2.0B if you **have not** prepared your learning plan

## 2.0A Planning and Reviewing of Learning Plan (50 minutes)

**Purpose:** The purpose for this session is to populate the learning planner for week 4 on *grouping of materials according to their synthesis* using the subject specific App.

**Learning Outcome (LO):** To populate the learning planner with the essential questions, differentiation, learning activities and key assessments and use the subject specific App to review your populated learning plan (NTS 2b, 2c, 2e, 2f, 3a, 3d, 3e, 3g–3k and 3o).

**Learning Indicator (LI) 1:** Populate the learning planner using the subject specific App

**Learning Indicator (LI) 2:** Enact an activity from your reviewed learning plan.

## 2.1 Refer to your Teacher Manual and have a chat with your subject specific App to develop your learning plan for Week 4 on grouping of materials according to their synthesis (NTS 1a, 2b, 2c, 2e-2h and 3a-3q).

*E.g.*

### i. **Essential questions**

*Generate five essential questions for week 4, focused on grouping materials by their synthesis: two on core content, one for planning diverse learners in a resource-constrained environment, and one for integrating 21st-century skills and Gender Equality and Social Inclusion (GESI).*

### ii. **Differentiation**

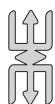
*Create five differentiated strategies that guide learners to build foundational understanding, encourage inquiry, support differentiation, and be inclusive for a school with limited learning tools.*

### iii. **Learning activities**

*Design 5 learning activities for Week 4 that are inclusive, differentiated, and suitable for a class with mixed abilities and special needs. Ensure the activities are practical for low-resource settings and promote inquiry and foundational understanding.*

### iv. **Assessment tasks**

*Using the Teacher Manual, develop 20 assessment items (for formative assessment) for Week 4 that are inclusive, practical, and support learners with diverse needs. Each item should include a rubric or marking scheme. Ensure the assessments are suitable for a low-resource classroom.*



### **Note**

- i. Chatting once may not be enough for the App to provide all that you may need for the tasks
- ii. **Transfer the information from your SS App into your learning planner template to complete your plans.**
- iii. Chat with your App to learn how to integrate National Values, GESI, SEL and 21<sup>st</sup> century skills in your learning activities, assessment tasks and rubrics/mark scheme.

**Hint**



Move to Activity 3.0

## 2.0B Reviewing the Learning Plan and Addressing Challenges in Planning, Delivering and Assessing Lessons (50 minutes)

**Purpose:** To support teachers address challenges they may have during lesson preparation and delivery.

**Learning Outcome (LO):** To address specific concerns of teachers in planning, teaching and assessment.

**Learning Indicator (LI) 1:** Address challenges in the preparation and delivery of a lesson.

**Learning Indicator (LI) 2:** Enact an activity in preparation to teach the lesson.

- 2.1** Upload your completed learning plan into the subject specific App. Have a chat with your App to verify the following and discuss their suitability to reflect the diverse needs of learners in your class (NTS 1a, 2b, 2c and 3e–3q).

*E.g.*

### **Learning activities**

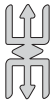
*There are 70 learners in my class, including 2 wheelchair users and 5 fast learners. review the learning activities for week 4 learning plan, ensuring they align with the teacher's manual. Suggest areas for improvement to better accommodate the needs of learners and the class size, etc.*

**Hint**



Continue chatting with your App to verify the following and use the responses to complete your plan

- a. essential questions
- b. differentiation
- c. assessment tasks, etc.

**Note**

- i. *Chatting once may not be enough for the App to provide all that you may need for the tasks*
- ii. *Transfer the information from your SS App into your learning planner template to complete your plans*
- iii. *Chat with your App to learn how to integrate National Values, GESI, SEL and 21<sup>st</sup> century skills in your learning activities, assessment tasks and rubrics/mark scheme.*

**2.2** Identify a challenging area or issue and chat with your subject specific App for steps on how to address it for effective lesson delivery (NTS 3j).

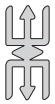
**2.3** Share your experience with the group.

## **2.0 Enactment (25 minutes)**

**2.1** Enact a teaching activity in your plan (NTS 1b, 1f, 1g, 2c, 2e, 2f and 3c–3j).

**2.2** Reflect on the activity enacted to improve lesson delivery (NTS 1a).

**2.3** Ask for feedback on the activity enacted (NTS 1a, 1e, 2c and 3o).

**Note**

*You may record the enacted activity.*

## **3.0 Reflection (10 minutes)**

**3.1** Reflect and share your views on the session (NTS 1a, 1b).

**3.2** Identify a colleague to observe your lesson in relation to PLC Session 4 to provide feedback on your lesson (NTS 1f, 1g).

**3.3** Remember to:

- a. read PLC Session 5, Teacher Manual and related Learner Material (NTS 3a).
- b. bring along your laptop, Teacher Manual and PLC Handbook in preparation for the next session (NTS 3a).
- c. identify areas you found challenging in your teaching for discussion during the next session.

# PLC Session 5: Materials loading and effect of loading, stress and strain on materials

## 1.0 Introduction (5 minutes)

- 1.1 Share one thing you applied in your classroom based on PLC Session 4
  - a. the challenges you faced
  - b. how you addressed them
- 1.2 Have you developed your learning plan for week 5?
  - a. If you answered **yes**, conduct your PLC Session from Activity 2.0B
  - b. If you answered **no**, conduct your PLC Session from Activity 2.0A

### Hint



You cannot conduct PLC on Activity 2.0B if you **have not** prepared your learning plan

## 2.0A Planning and Reviewing of Learning Plan (50 minutes)

**Purpose:** The purpose for this session is to populate the learning planner for week 5 on *materials loading and effect of loading, stress and strain on materials* using the subject specific App.

**Learning Outcome (LO):** To populate the learning planner with the essential questions, differentiation, learning activities and key assessments and use the subject specific App to review your populated learning plan (NTS 2b, 2c, 2e, 2f, 3a, 3d, 3e, 3g–3k and 3o).

**Learning Indicator (LI) 1:** Populate the learning planner using the subject specific App

**Learning Indicator (LI) 2:** Enact an activity from your reviewed learning plan.

- 2.1** Refer to your Teacher Manual and have a chat with your subject specific App to develop your learning plan for Week 5 on materials loading and effect of loading, stress and strain on materials (NTS 1a, 2b, 2c, 2e–2h and 3a–3q).

*E.g.*

**i. Essential questions**

*Develop five essential questions to guide the week's lesson on materials loading and the effect of loading, stress and strain on materials. Two questions should concentrate on the core content, one should assist in planning for learners with diverse abilities in a resource-constrained environment, and one should help integrate 21st-century skills and Gender Equality and Social Inclusion (GESI) into the lesson.*

**ii. Differentiation**

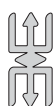
*Give 4 differentiated strategies for 35 learners that encourage inquiry and real-world thinking, support differentiation, and are inclusive and practical*

**iii. Learning activities**

*Using the Teacher Manual, create 5 learning activities for Week 5 that are inclusive, differentiated, and suitable for a class of 45 learners with mixed abilities and special needs. Ensure the activities are practical and promote inquiry and foundational understanding.*

**iv. Assessment tasks**

*Develop 20 formative assessment items that are inclusive, practical, and support learners with diverse needs. Include a rubric or marking scheme for scoring*



**Note**

- i.** Chatting once may not be enough for the App to provide all that you may need for the tasks
- ii.** Transfer the information from your SS App into your learning planner template to complete your plans.
- iii.** Chat with your App to learn how to integrate National Values, GESI, SEL and 21<sup>st</sup> century skills in your learning activities, assessment tasks and rubrics/mark scheme.

**Hint**

Move to Activity 3.0



## 2.0B Reviewing the Learning Plan and Addressing Challenges in Planning, Delivering and Assessing Lessons (50 minutes)

**Purpose:** To support teachers address challenges they may have during lesson preparation and delivery.

**Learning Outcome (LO):** To address specific concerns of teachers in planning, teaching and assessment.

**Learning Indicator (LI) 1:** Address challenges in the preparation and delivery of a lesson.

**Learning Indicator (LI) 2:** Enact an activity in preparation to teach the lesson.

- 2.1** Upload your completed learning plan into the subject specific App. Have a chat with your App to verify the following and discuss their suitability to reflect the diverse needs of learners in your class (NTS 1a, 2b, 2c and 3e-3q).

*E.g.*

### **Learning activities**

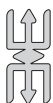
*I have 40 learners, 2 are wheelchair users, and 5 are fast learners. Review the learning activities in the learning plan on properties and equation of a circle in alignment with the teacher manual and suggest areas for improvement to suit the learners, class size, etc.*

### **Hint**



Continue chatting with your App to verify the following and use the responses to complete your plan

- a. essential questions
- b. differentiation
- c. assessment tasks, etc.



### **Note**

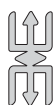
- i. Chatting once may not be enough for the App to provide all that you may need for the tasks
- ii. Transfer the information from your SS App into your learning planner template to complete your plans

- iii. *Chat with your App to learn how to integrate National Values, GESI, SEL and 21<sup>st</sup> century skills in your learning activities, assessment tasks and rubrics/mark scheme.*

- 2.2 Identify a challenging area or issue and chat with your subject specific App for steps on how to address it for effective lesson delivery (NTS 3j).
- 2.3 Share your experience with the group.

### 3.0 Enactment (25 minutes)

- 3.1 Enact a teaching activity in your plan (NTS 1b, 1f, 1g, 2c, 2e, 2f and 3c–3j).
- 3.2 Reflect on the activity enacted to improve lesson delivery (NTS 1a).
- 3.3 Ask for feedback on the activity enacted (NTS 1a, 1e, 2c and 3o).



#### Note

*You may record the enacted activity.*

### 4.0 Reflection (10 minutes)

- 4.1 Reflect and share your views on the session (NTS 1a, 1b).
- 4.2 Identify a colleague to observe your lesson in relation to PLC Session 5 to provide feedback on your lesson (NTS 1f, 1g).
- 4.3 Remember to:
  - a. read PLC Session 6, Teacher Manual and related Learner Material (NTS 3a).
  - b. bring along your laptop, Teacher Manual and PLC Handbook in preparation for the next session (NTS 3a).
  - c. identify areas you found challenging in your teaching for discussion during the next session.

# PLC Session 6: Preparing for Mid-Semester Examination

## 1.0 Introduction (10 minutes)

- 1.1 Share one thing on assessment in PLC Session 5 that you
  - a. applied in your lesson delivery
  - b. found challenging and how you addressed it.
- 1.2 Share one challenge you encountered while populating your learning plan for week 6 before the session that you would like to discuss during this PLC session.
- 1.3 Read and discuss the Purpose, Learning Outcome (LO) and Learning Indicators (LIs) for the session.

**Purpose:** The purpose of this session is to use the subject-specific App to

1. review the completed learning plan for week 6
2. prepare assessment tasks and rubrics for mid-semester examination

**Learning Outcome (LO):** To review the learning plan for week 6 and address any challenges in planning and developing assessment tasks for the mid-semester examination (NTS 2b, 2c, 2e, 2f, 3a, 3d, 3e, 3g-3k and 3o).

**Learning Indicator (LI) 1:** Review the learning plan and address challenges in the preparation and delivery of a lesson.

**Learning Indicator (LI) 2:** Discuss, develop and review assessment tasks with rubrics for the mid-semester examination.

## 2.0 Reviewing the Learning Plan (20 minutes)

- 2.1 Upload your learning plan into the subject-specific App. Have a chat with your App to verify the following and discuss their suitability to reflect the diverse needs of learners in your class (NTS 1a, 2b, 2c and 3e-3q).

*E.g.*

### **Differentiation**

*Develop differentiation strategies sufficient to effectively meet the needs of learners with visual impairment*

#### **Hint**



Continue chatting with your App to verify the following and use the responses to complete your plan

- a. assessment tasks
- b. essential questions
- c. Learning activities, etc.

## **3.0 Prepare for Mid-Semester Examination (50 minutes)**

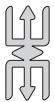
- 3.1** Refer to your Teacher Manual for the format of the mid-semester examination and use the subject-specific App to review or develop your assessment tasks, mark schemes/rubrics, etc. (NTS 2a–2c, 2e–2h and 3j–3q).

*E.g.*

*The Teacher Manual recommends that the mid-semester examination in week 6 should contain 40 multiple-choice and 3 essay type questions distributed 30%, 40% and 30% across DoK levels 1, 2 and (3 & 4). Develop:*

1. 40 multiple-choice questions (with options listed alphabetically)
2. 3 essay-type questions
3. Mark scheme/ Rubrics for the examination

*The examination is for 1 hour. The assessment tasks developed should align with the learning indicators in weeks 1 to 5.*



#### **Note**

*In preparing for mid-semester examination, one chat may not be enough for the App to provide all you need (DoK levels, structure, distribution across DoK levels, etc.)*

- 3.2** Have a chat with your App to review the suggested assessment tasks and discuss the suitability of the responses from activity 3.1. Use the review to refine the responses and complete the set questions (NTS 1a, 2b, 2c and 3e–3q). In doing this activity, consider:

*E.g.*

- i. Whether the assessment tasks generated follow 30%, 40%, 30% DoK distribution**

*Review the distribution of assessment tasks across DOK levels 1 to 4*

- ii. Mark scheme and score distribution**

*Revise the rubrics for the essay questions to provide a detailed breakdown of how to achieve the final score for each performance criterion, etc.*

- iii. Resources needed for assessment administration**

*Suggest resources and materials learners will need to effectively prepare for and complete the mid-semester examination.*

- iv. How to provide feedback**

*Suggest written and oral feedback strategies to learners during and after the assessment.*

## **4.0 Reflection (10 minutes)**

- 4.1** Reflect and share your views on the session (NTS 1a, 1b).

- 4.2** Identify a colleague to observe your lesson in relation to PLC Session 6 to provide feedback on your lesson (NTS 1f, 1g).

- 4.3** Remember to:

- a.** mark, record and upload your learners' assessment scores in the Student Transcript Portal.
- b.** read PLC Session 7, Teacher Manual and related Learner Material (NTS 3a).
- c.** bring along your Teacher Manual and PLC Handbook in preparation for the next session (NTS 3a).
- d.** identify areas you found challenging in your planning and administration of the assessment for discussion during the next session.

# PLC Session 7: Tensile properties of steel

## 1.0 Introduction (5 minutes)

- 1.1 Share one thing you applied in your classroom based on PLC Session 6
  - a. the challenges you faced
  - b. how you addressed them
- 1.2 Have you developed your learning plan for week 7?
  - a. If you answered **yes**, conduct your PLC Session from Activity 2.0B
  - b. If you answered **no**, conduct your PLC Session from Activity 2.0A

### Hint



You cannot conduct PLC on Activity 2.0B if you **have not** prepared your learning plan

## 2.0A Planning and Reviewing of Learning Plan (50 minutes)

**Purpose:** The purpose for this session is to populate the learning planner for week 7 on *tensile properties of steel* using the subject specific App.

**Learning Outcome (LO):** To populate the learning planner with the essential questions, differentiation, learning activities and key assessments and use the subject specific App to review your populated learning plan (NTS 2b, 2c, 2e, 2f, 3a, 3d, 3e, 3g–3k and 3o).

**Learning Indicator (LI) 1:** Populate the learning planner using the subject specific App

**Learning Indicator (LI) 2:** Enact an activity from your reviewed learning plan.

- 2.1** Refer to your Teacher Manual and have a chat with your subject specific App to develop your learning plan for Week 7 on tensile properties of steel (NTS 1a, 2b, 2c, 2e–2h and 3a–3q).

*E.g.*

**i. Essential questions**

*Create essential questions that help learners understand the tensile properties of steel*

**ii. Differentiation**

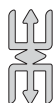
*Design strategies to help slow learners grasp the concepts of tensile strength, yield strength, and elastic modulus through visual aids and hands-on demonstrations*

**iii. Learning activities**

*Develop learning activities that support diverse learners in investigating tensile properties of steel through practical experiments or simulations, connecting theory to real-world manufacturing applications*

**iv. Assessment tasks**

*Develop assessment tasks that help struggling learners analyse stress–strain curves and relate tensile properties to steel's performance in manufacturing processes*



**Note**

- i.** Chatting once may not be enough for the App to provide all that you may need for the tasks
- ii.** Transfer the information from your SS App into your learning planner template to complete your plans.
- iii.** Chat with your App to learn how to integrate National Values, GESI, SEL and 21<sup>st</sup> century skills in your learning activities, assessment tasks and rubrics/mark scheme.

**Hint**



Move to Activity 3.0

## 2.0B Reviewing the Learning Plan and Addressing Challenges in Planning, Delivering and Assessing Lessons (50 minutes)

**Purpose:** To support teachers address challenges they may have during lesson preparation and delivery.

**Learning Outcome (LO):** To address specific concerns of teachers in planning, teaching and assessment.

**Learning Indicator (LI) 1:** Address challenges in the preparation and delivery of a lesson.

**Learning Indicator (LI) 2:** Enact an activity in preparation to teach the lesson.

- 2.1** Upload your completed learning plan into the subject specific App. Have a chat with your App to verify the following and discuss their suitability to reflect the diverse needs of learners in your class (NTS 1a, 2b, 2c and 3e-3q).

*E.g.*

### *Learning activities*

*Review the learning activities in my learning plan on grouping materials according to their synthesis with the teacher manual, and suggest areas for improvement to help learners understand the relationship between synthesis methods and material properties, etc.*

### Hint



Continue chatting with your App to verify the following and use the responses to complete your plan

- a. essential questions
- b. differentiation
- c. assessment tasks, etc.



### Note

- i. Chatting once may not be enough for the App to provide all that you may need for the tasks
- ii. Transfer the information from your SS App into your learning planner template to complete your plans
- iii. Chat with your App to learn how to integrate National Values, GESI, SEL and 21<sup>st</sup> century skills in your learning activities, assessment tasks and rubrics/mark scheme.

**2.2** Identify a challenging area or issue and chat with your subject specific App for steps on how to address it for effective lesson delivery (NTS 3j).

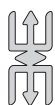
**2.3** Share your experience with the group.

### **3.0 Enactment (25 minutes)**

**3.1** Enact a teaching activity in your plan (NTS 1b, 1f, 1g, 2c, 2e, 2f and 3c–3j).

**3.2** Reflect on the activity enacted to improve lesson delivery (NTS 1a).

**3.3** Ask for feedback on the activity enacted (NTS 1a, 1e, 2c and 3o).



#### **Note**

*You may record the enacted activity.*

### **4.0 Reflection (10 minutes)**

**4.1** Reflect and share your views on the session (NTS 1a, 1b).

**4.2** Identify a colleague to observe your lesson in relation to PLC Session 7 to provide feedback on your lesson (NTS 1f, 1g).

**4.3** Remember to:

- a.** read PLC Session 8, Teacher Manual and related Learner Material (NTS 3a).
- b.** bring along your laptop, Teacher Manual and PLC Handbook in preparation for the next session (NTS 3a).
- c.** identify areas you found challenging in your teaching for discussion during the next session.

# PLC Session 8: Importance and application of freehand sketching in product design

## 1.0 Introduction (5 minutes)

- 1.1 Share one thing you applied in your classroom based on PLC Session 7
  - a. the challenges you faced
  - b. how you addressed them
- 1.2 Have you developed your learning plan for week 8?
  - a. If you answered **yes**, conduct your PLC Session from Activity 2.0B
  - b. If you answered **no**, conduct your PLC Session from Activity 2.0A

### Hint



You cannot conduct PLC on Activity 2.0B if you **have not** prepared your learning plan

## 2.0A Planning and Reviewing of Learning Plan (50 minutes)

**Purpose:** The purpose for this session is to populate the learning planner for week 8 on importance and application of freehand sketching in product design using the subject specific App.

**Learning Outcome (LO):** To populate the learning planner with the essential questions, differentiation, learning activities and key assessments and use the subject specific App to review your populated learning plan (NTS 2b, 2c, 2e, 2f, 3a, 3d, 3e, 3g–3k and 3o).

**Learning Indicator (LI) 1:** Populate the learning planner using the subject specific App

**Learning Indicator (LI) 2:** Enact an activity from your reviewed learning plan.

- 2.1** Refer to your Teacher Manual and have a chat with your subject specific App to develop your learning plan for Week 8 on importance and application of freehand sketching in product design (NTS 1a, 2b, 2c, 2e–2h and 3a–3q).

*E.g.*

**i. Essential questions**

*Create essential questions to guide the teaching and learning that help learners understand why freehand sketching is fundamental to product design and how it facilitates visual communication and creativity in the design process*

**ii. Differentiation**

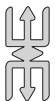
*Design differentiated strategies to help learners with different artistic abilities engage with freehand sketching, providing support for those who lack confidence in drawing, while challenging proficient sketchers*

**iii. Learning activities**

*Develop learning activities that engage learners in practical freehand sketching exercises, helping them explore design ideas and communicate concepts effectively through visual means*

**iv. Assessment tasks**

*Develop display and exhibition assessment tasks that allow learners to showcase their freehand sketching skills while demonstrating understanding of design principles and problem-solving approaches*



**Note**

- i.** Chatting once may not be enough for the App to provide all that you may need for the tasks
- ii.** Transfer the information from your SS App into your learning planner template to complete your plans.
- iii.** Chat with your App to learn how to integrate National Values, GESI, SEL and 21<sup>st</sup> century skills in your learning activities, assessment tasks and rubrics/mark scheme.

**Hint**



Move to Activity 3.0

## 2.0B Reviewing the Learning Plan and Addressing Challenges in Planning, Delivering and Assessing Lessons (50 minutes)

**Purpose:** To support teachers address challenges they may have during lesson preparation and delivery.

**Learning Outcome (LO):** To address specific concerns of teachers in planning, teaching and assessment.

**Learning Indicator (LI) 1:** Address challenges in the preparation and delivery of a lesson.

**Learning Indicator (LI) 2:** Enact an activity in preparation to teach the lesson.

- 2.1** Upload your completed learning plan into the subject specific App. Have a chat with your App to verify the following and discuss their suitability to reflect the diverse needs of learners in your class (NTS 1a, 2b, 2c and 3e–3q).

*E.g.*

### **Learning activities**

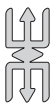
*Review the learning activities in my learning plan on freehand sketching in product design and suggest areas for improvement to guide learners who are hesitant about drawing to feel more confident and engaged, etc.*

### **Hint**



Continue chatting with your App to verify the following and use the responses to complete your plan

- a. essential questions
- b. differentiation
- c. assessment tasks, etc.



### **Note**

- i. Chatting once may not be enough for the App to provide all that you may need for the tasks
- ii. Transfer the information from your SS App into your learning planner template to complete your plans
- iii. Chat with your App to learn how to integrate National Values, GESI, SEL and 21<sup>st</sup> century skills in your learning activities, assessment tasks and rubrics/mark scheme.

**2.2** Identify a challenging area or issue and chat with your subject specific App for steps on how to address it for effective lesson delivery (NTS 3j).

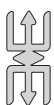
**2.3** Share your experience with the group.

### **3.0 Enactment (25 minutes)**

**3.1** Enact a teaching activity in your plan (NTS 1b, 1f, 1g, 2c, 2e, 2f and 3c–3j).

**3.2** Reflect on the activity enacted to improve lesson delivery (NTS 1a).

**3.3** Ask for feedback on the activity enacted (NTS 1a, 1e, 2c and 3o).



#### **Note**

*You may record the enacted activity.*

### **4.0 Reflection (10 minutes)**

**4.1** Reflect and share your views on the session (NTS 1a, 1b).

**4.2** Identify a colleague to observe your lesson in relation to PLC Session 8 to provide feedback on your lesson (NTS 1f, 1g).

**4.3** Remember to:

- a.** read PLC Session 9, Teacher Manual and related Learner Material (NTS 3a).
- b.** bring along your laptop, Teacher Manual and PLC Handbook in preparation for the next session (NTS 3a).
- c.** identify areas you found challenging in your teaching for discussion during the next session.

# PLC Session 9: Importance of isometric drawing and application of first-angle projection in product design

## 1.0 Introduction (5 minutes)

- 1.1 Share one thing you applied in your classroom based on PLC Session 8
  - a. the challenges you faced
  - b. how you addressed them
- 1.2 Have you developed your learning plan for week 9?
  - a. If you answered **yes**, conduct your PLC Session from Activity 2.0B
  - b. If you answered **no**, conduct your PLC Session from Activity 2.0A

### Hint



You cannot conduct PLC on Activity 2.0B if you **have not** prepared your learning plan

## 2.0A Planning and Reviewing of Learning Plan (50 minutes)

**Purpose:** The purpose for this session is to populate the learning planner for week 9 on *importance of isometric drawing and application of first-angle projection in product design* using the subject specific App.

**Learning Outcome (LO):** To populate the learning planner with the essential questions, differentiation, learning activities and key assessments and use the subject specific App to review your populated learning plan (NTS 2b, 2c, 2e, 2f, 3a, 3d, 3e, 3g–3k and 3o).

**Learning Indicator (LI) 1:** Populate the learning planner using the subject specific App

**Learning Indicator (LI) 2:** Enact an activity from your reviewed learning plan.

- 2.1** Refer to your Teacher Manual and have a chat with your subject specific App to develop your learning plan for Week 9 on importance of isometric drawing and application of first-angle projection in product design (NTS 1a, 2b, 2c, 2e–2h and 3a–3q).

*E.g.*

**i. Essential questions**

*Create essential questions that help learners understand how isometric drawings provide 3D visualisation of objects and how first-angle projection creates accurate technical drawings for manufacturing*

**ii. Differentiation**

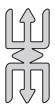
*Using the teacher manual and learner manuals, design strategies to help visual learners grasp isometric projection concepts through hands-on activities with building blocks, while supporting learners who struggle with spatial visualisation through step-by-step guidance*

**iii. Learning activities**

*Develop interactive learning activities that help learners demonstrate their understanding of isometric angles, projection principles, and the practical applications of both drawing methods in product design*

**iv. Assessment tasks**

*Develop questioning assessment tasks that help learners demonstrate their understanding of isometric angles, projection principles, and the practical applications of both drawing methods in product design*



**Note**

- i.** Chatting once may not be enough for the App to provide all that you may need for the tasks
- ii.** Transfer the information from your SS App into your learning planner template to complete your plans.
- iii.** Chat with your App to learn how to integrate National Values, GESI, SEL and 21<sup>st</sup> century skills in your learning activities, assessment tasks and rubrics/mark scheme.

**Hint**

Move to Activity 3.0



## 2.0B Reviewing the Learning Plan and Addressing Challenges in Planning, Delivering and Assessing Lessons (50 minutes)

**Purpose:** To support teachers address challenges they may have during lesson preparation and delivery.

**Learning Outcome (LO):** To address specific concerns of teachers in planning, teaching and assessment.

**Learning Indicator (LI) 1:** Address challenges in the preparation and delivery of a lesson.

**Learning Indicator (LI) 2:** Enact an activity in preparation to teach the lesson.

- 2.1** Upload your completed learning plan into the subject specific App. Have a chat with your App to verify the following and discuss their suitability to reflect the diverse needs of learners in your class (NTS 1a, 2b, 2c and 3e–3q).

*E.g.*

### ***Differentiation***

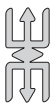
*Review the differentiation strategies in the learning plan to ensure they effectively aid learners' understanding of isometric drawing principles and first-angle projection applications, and suggest improvements for clarity, etc.*

### **Hint**



Continue chatting with your App to verify the following and use the responses to complete your plan

- a. essential questions
- b. assessment tasks
- c. learning activities, etc.



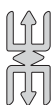
### **Note**

- i. *Chatting once may not be enough for the App to provide all that you may need for the tasks*
- ii. *Transfer the information from your SS App into your learning planner template to complete your plans*
- iii. *Chat with your App to learn how to integrate National Values, GESI, SEL and 21<sup>st</sup> century skills in your learning activities, assessment tasks and rubrics/mark scheme.*

- 1.2** Identify a challenging area or issue and chat with your subject specific App for steps on how to address it for effective lesson delivery (NTS 3j).
- 1.3** Share your experience with the group.

### **3.0 Enactment (25 minutes)**

- 3.1** Enact a teaching activity in your plan (NTS 1b, 1f, 1g, 2c, 2e, 2f and 3c–3j).
- 3.2** Reflect on the activity enacted to improve lesson delivery (NTS 1a).
- 3.3** Ask for feedback on the activity enacted (NTS 1a, 1e, 2c and 3o).



#### **Note**

*You may record the enacted activity.*

### **4.0 Reflection (10 minutes)**

- 4.1** Reflect and share your views on the session (NTS 1a, 1b).
- 4.2** Identify a colleague to observe your lesson in relation to PLC Session 9 to provide feedback on your lesson (NTS 1f, 1g).
- 4.3** Remember to:
  - a.** read PLC Session 10, Teacher Manual and related Learner Material (NTS 3a).
  - b.** bring along your laptop, Teacher Manual and PLC Handbook in preparation for the next session (NTS 3a).
  - c.** identify areas you found challenging in your teaching for discussion during the next session.

# PLC Session 10: Importance of sectioning, dimensioning and tolerance

## 1.0 Introduction (5 minutes)

- 1.1 Share one thing you applied in your classroom based on PLC Session 9
  - a. the challenges you faced
  - b. how you addressed them
- 1.2 Have you developed your learning plan for week 10?
  - a. If you answered **yes**, conduct your PLC Session from Activity 2.0B
  - b. If you answered **no**, conduct your PLC Session from Activity 2.0A

### Hint



You cannot conduct PLC on Activity 2.0B if you **have not** prepared your learning plan

## 2.0A Planning and Reviewing of Learning Plan (50 minutes)

**Purpose:** The purpose for this session is to populate the learning planner for week 10 on *importance of sectioning, dimensioning and tolerance* using the subject specific App.

**Learning Outcome (LO):** To populate the learning planner with the essential questions, differentiation, learning activities and key assessments and use the subject specific App to review your populated learning plan (NTS 2b, 2c, 2e, 2f, 3a, 3d, 3e, 3g–3k and 3o).

**Learning Indicator (LI) 1:** Populate the learning planner using the subject specific App

**Learning Indicator (LI) 2:** Enact an activity from your reviewed learning plan.

- 2.1** Refer to your Teacher Manual and have a chat with your subject specific App to develop your learning plan for Week 10 on importance of sectioning, dimensioning and tolerance (NTS 1a, 2b, 2c, 2e–2h and 3a–3q).

*E.g.*

**i. Essential questions**

*Generate essential questions that help learners understand how sectioning reveals internal features, how dimensioning ensures accurate manufacturing, and how tolerance controls quality in production processes*

**ii. Differentiation**

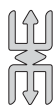
*Design strategies to help slow, average, and fast learners grasp the concepts of sectioning, dimensioning, and tolerance through visual demonstrations and hands-on activities with sample drawings and geometric objects*

**iii. Learning activities**

*Develop learning activities that engage learners in creating section views, adding dimensions to drawings, and understanding tolerance applications through practical exercises with mechanical components*

**iv. Assessment tasks**

*Develop research assessment tasks that help learners investigate how improper sectioning, dimensioning, and tolerance affect machine assembly processes and manufacturing quality*



**Note**

- i.** Chatting once may not be enough for the App to provide all that you may need for the tasks
- ii.** Transfer the information from your SS App into your learning planner template to complete your plans.
- iii.** Chat with your App to learn how to integrate National Values, GESI, SEL and 21<sup>st</sup> century skills in your learning activities, assessment tasks and rubrics/mark scheme.

**Hint**



Move to Activity 3.0

## 2.0B Reviewing the Learning Plan and Addressing Challenges in Planning, Delivering and Assessing Lessons (50 minutes)

**Purpose:** To support teachers address challenges they may have during lesson preparation and delivery.

**Learning Outcome (LO):** To address specific concerns of teachers in planning, teaching and assessment.

**Learning Indicator (LI) 1:** Address challenges in the preparation and delivery of a lesson.

**Learning Indicator (LI) 2:** Enact an activity in preparation to teach the lesson.

- 2.1** Upload your completed learning plan into the subject specific App. Have a chat with your App to verify the following and discuss their suitability to reflect the diverse needs of learners in your class (NTS 1a, 2b, 2c and 3e–3q).

*E.g.*

### **Learning activities**

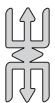
*Review the learning activities in the learning plan on sectioning, dimensioning and tolerance, and suggest areas for improvement to help learners understand how these concepts apply to real manufacturing scenarios, etc.*

### **Hint**



Continue chatting with your App to verify the following and use the responses to complete your plan

- a. essential questions
- b. differentiation
- c. assessment tasks, etc.



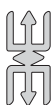
### **Note**

- i. Chatting once may not be enough for the App to provide all that you may need for the tasks
- ii. Transfer the information from your SS App into your learning planner template to complete your plans
- iii. Chat with your App to learn how to integrate National Values, GESI, SEL and 21<sup>st</sup> century skills in your learning activities, assessment tasks and rubrics/mark scheme.

- 1.2** Identify a challenging area or issue and chat with your subject specific App for steps on how to address it for effective lesson delivery (NTS 3j).
- 1.3** Share your experience with the group.

### **3.0 Enactment (25 minutes)**

- 3.1** Enact a teaching activity in your plan (NTS 1b, 1f, 1g, 2c, 2e, 2f and 3c–3j).
- 3.2** Reflect on the activity enacted to improve lesson delivery (NTS 1a).
- 3.3** Ask for feedback on the activity enacted (NTS 1a, 1e, 2c and 3o).



#### **Note**

*You may record the enacted activity.*

### **4.0 Reflection (10 minutes)**

- 4.1** Reflect and share your views on the session (NTS 1a, 1b).
- 4.2** Identify a colleague to observe your lesson in relation to PLC Session 10 to provide feedback on your lesson (NTS 1f, 1g).
- 4.3** Remember to:
  - a.** read PLC Session 11, Teacher Manual and related Learner Material (NTS 3a).
  - b.** bring along your laptop, Teacher Manual and PLC Handbook in preparation for the next session (NTS 3a).
  - c.** identify areas you found challenging in your teaching for discussion during the next session.

# PLC Session 11: Application of detailed drawings in product design and modelling

## 1.0 Introduction (5 minutes)

- 1.1 Share one thing you applied in your classroom based on PLC Session 10
  - a. the challenges you faced
  - b. how you addressed them
- 1.2 Have you developed your learning plan for week 11?
  - a. If you answered **yes**, conduct your PLC Session from Activity 2.0B
  - b. If you answered **no**, conduct your PLC Session from Activity 2.0A

### Hint



You cannot conduct PLC on Activity 2.0B if you **have not** prepared your learning plan

## 2.0A Planning and Reviewing of Learning Plan (50 minutes)

**Purpose:** The purpose for this session is to populate the learning planner for week 11 on *application of detailed drawings in product design and modelling* using the subject specific App.

**Learning Outcome (LO):** To populate the learning planner with the essential questions, differentiation, learning activities and key assessments and use the subject specific App to review your populated learning plan (NTS 2b, 2c, 2e, 2f, 3a, 3d, 3e, 3g–3k and 3o).

**Learning Indicator (LI) 1:** Populate the learning planner using the subject specific App

**Learning Indicator (LI) 2:** Enact an activity from your reviewed learning plan.

- 2.1** Refer to your Teacher Manual and have a chat with your subject specific App to develop your learning plan for Week 11 on application of detailed drawings in product design and modelling (NTS 1a, 2b, 2c, 2e–2h and 3a–3q).

*E.g.*

**i. Essential questions**

*Create five essential questions that help learners understand how detailed drawings provide comprehensive specifications for individual components and how they differ from assembly drawings in manufacturing processes*

**ii. Differentiation**

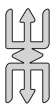
*Design three strategies to help learners with varying technical drawing abilities create detailed drawings of mechanical components, providing step-by-step guidance for beginners while challenging advanced learners with complex detailing techniques*

**iii. Learning activities**

*From the teacher and learner manuals, develop three learning activities that engage learners in creating detailed drawings of simple mechanical components using orthographic views, dimensions, tolerances, and annotations while considering manufacturing requirements*

**iv. Assessment tasks**

*Develop four discussion assessment tasks that help learners analyse the role of exploded views in designing and assembling complex mechanical components like car gearboxes, demonstrating their understanding of detailed drawing applications*



**Note**

- i.** Chatting once may not be enough for the App to provide all that you may need for the tasks
- ii.** Transfer the information from your SS App into your learning planner template to complete your plans.
- iii.** Chat with your App to learn how to integrate National Values, GESI, SEL and 21<sup>st</sup> century skills in your learning activities, assessment tasks and rubrics/mark scheme.

**Hint**

Move to Activity 3.0



## 2.0B Reviewing the Learning Plan and Addressing Challenges in Planning, Delivering and Assessing Lessons (50 minutes)

**Purpose:** To support teachers address challenges they may have during lesson preparation and delivery.

**Learning Outcome (LO):** To address specific concerns of teachers in planning, teaching and assessment.

**Learning Indicator (LI) 1:** Address challenges in the preparation and delivery of a lesson.

**Learning Indicator (LI) 2:** Enact an activity in preparation to teach the lesson.

- 2.1** Upload your completed learning plan into the subject specific App. Have a chat with your App to verify the following and discuss their suitability to reflect the diverse needs of learners in your class (NTS 1a, 2b, 2c and 3e–3q).

*E.g.*

### **Assessment tasks**

*Review the discussion assessment tasks in the lesson plan to effectively support struggling learners in answering Level 3 questions on detailed drawings and their applications in complex mechanical systems, and suggest ways to improve them.*

### **Hint**



Continue chatting with your App to verify the following and use the responses to complete your plan

- a. essential questions
- b. differentiation
- c. learning activities, etc.



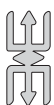
### **Note**

- i. Chatting once may not be enough for the App to provide all that you may need for the tasks
- ii. Transfer the information from your SS App into your learning planner template to complete your plans
- iii. Chat with your App to learn how to integrate National Values, GESI, SEL and 21<sup>st</sup> century skills in your learning activities, assessment tasks and rubrics/mark scheme.

- 1.2** Identify a challenging area or issue and chat with your subject specific App for steps on how to address it for effective lesson delivery (NTS 3j).
- 1.3** Share your experience with the group.

### **3.0 Enactment (25 minutes)**

- 3.1** Enact a teaching activity in your plan (NTS 1b, 1f, 1g, 2c, 2e, 2f and 3c–3j).
- 3.2** Reflect on the activity enacted to improve lesson delivery (NTS 1a).
- 3.3** Ask for feedback on the activity enacted (NTS 1a, 1e, 2c and 3o).



#### **Note**

*You may record the enacted activity.*

### **4.0 Reflection (10 minutes)**

- 4.1** Reflect and share your views on the session (NTS 1a, 1b).
- 4.2** Identify a colleague to observe your lesson in relation to PLC Session 11 to provide feedback on your lesson (NTS 1f, 1g).
- 4.3** Remember to:
  - a.** read PLC Session 12, Teacher Manual and related Learner Material (NTS 3a).
  - b.** bring along your laptop, Teacher Manual and PLC Handbook in preparation for the next session (NTS 3a).
  - c.** identify areas you found challenging in your teaching for discussion during the next session.

# PLC Session 12: Preparing for End of Semester Examination

## 1.0 Introduction (10 minutes)

- 1.1 Share one thing on assessment in PLC Session 11 that you
  - a. applied in your lesson delivery
  - b. found challenging and how you addressed it.
- 1.2 Share one challenge you encountered while populating your learning plan for week 12 before the session that you would like to discuss during this PLC session.
- 1.3 Read and discuss the Purpose, Learning Outcome (LO) and Learning Indicators (LIs) for the session.

**Purpose:** The purpose of this session is to use the subject-specific App to

1. review the completed learning plan for week 12
2. prepare assessment tasks and rubrics for end of semester examination

**Learning Outcome (LO):** To review the learning plan for week 12 and address any challenges in planning and developing assessment tasks for the end of semester examination (NTS 2b, 2c, 2e, 2f, 3a, 3d, 3e, 3g-3k and 3o).

**Learning Indicator (LI) 1:** Review the learning plan and address challenges in the preparation and delivery of a lesson.

**Learning Indicator (LI) 2:** Discuss, develop and review assessment tasks with rubrics for the end of semester examination.

## 2.0 Reviewing the Learning Plan (20 minutes)

- 2.1 Upload your learning plan into the subject-specific App. Have a chat with your App to verify the following and discuss their suitability to reflect the diverse needs of learners in your class (NTS 1a, 2b, 2c and 3e-3q).

*E.g.*

### **Learning activities**

*Review the learning activities in the attached learning plan to align with pedagogies in the teacher manual*

#### **Hint**



Continue chatting with your App to verify the following and use the responses to complete your plan

- a. essential questions
- b. differentiation
- c. assessment tasks, etc.

## **3.0 Prepare for End of Semester Examination (50 minutes)**

- 3.1** Refer to your Teacher Manual for the format of the end of semester examination and use the subject-specific App to review or develop your assessment tasks, mark schemes/rubrics, etc. (NTS 2a–2c, 2e–2h and 3j–3q).

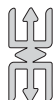
*E.g.*

*The Teacher Manual recommends that the end of semester examination in Week 12 should contain 40 multiple-choice and 3 essay-type questions distributed 30%, 40% and 30% across DoK levels 1, 2 and (3 & 4). develop:*

- a. 40 multiple-choice questions (with options listed alphabetically)
- b. 3 essay type questions
- c. Mark scheme for the examination

*The examination is for 2 hours. The developed assessment tasks should align with the learning indicators in weeks 1 to 11.*

#### **Note**



*In preparing for end of semester examination, one chat may not be enough for the App to provide all you need (DoK levels, structure, distribution across DoK levels, etc.)*

- 3.2** Have a chat with your App to review the suggested assessment tasks and discuss the suitability of the responses from activity 3.1. Use the review to refine the responses and complete the set questions (NTS 1a, 2b, 2c and 3e–3q). In doing this activity, consider:

*E.g.*

- i. Whether the assessment tasks generated follow 30%, 40%, 30% DoK distribution**  
*Review assessment tasks to follow 30%, 40%, 30% DoK distribution*
- ii. Mark scheme and score distribution**  
*Review the mark scheme to appropriately match score distribution to their DOK levels*
- iii. Resources needed for assessment administration**  
*Suggest resources needed for learners to complete the examination successfully*
- iv. How to provide feedback**  
*Suggest effective ways to provide feedback to learners after the assessment*

## 4.0 Reflection (10 minutes)

- 4.1** Reflect and share your views on the session (NTS 1a, 1b).
- 4.2** Identify a colleague to observe your lesson in relation to PLC Session 12 to provide feedback on your lesson (NTS 1f, 1g).
- 4.3** Remember to:
  - a.** mark, record and upload your learners' assessment scores in the Student Transcript Portal.
  - b.** read PLC Session 13, Teacher Manual and related Learner Material (NTS 3a).
  - c.** bring along your laptop, Teacher Manual and PLC Handbook in preparation for the next session (NTS 3a).
  - d.** identify areas you found challenging in your planning and administration of the assessment for discussion during the next session.

# PLC Session 2: Preparing for Student Transcript Portal Assessment – Individual Project

## 1.0 Introduction (10 minutes)

- 1.1 Share one thing on assessment in PLC Session 12 that you
  - a. applied in your lesson delivery
  - b. found challenging and how you addressed it.
- 1.2 Share one challenge you encountered while populating your learning plan for week 13 before the session that you would like to discuss during this PLC session.
- 1.3 Read and discuss the Purpose, Learning Outcome (LO) and Learning Indicators (LIs) for the session.

**Purpose:** The purpose of this session is to use the subject-specific App to

- 1. review the completed learning plan for week 13
- 2. prepare assessment tasks and rubrics for individual project

**Learning Outcome (LO):** To review the learning plan for week 13 and address any challenges in planning and developing assessment tasks for the individual project (NTS 2b, 2c, 2e, 2f, 3a, 3d, 3e, 3g-3k and 3o).

**Learning Indicator (LI) 1:** Review the learning plan and address challenges in the preparation and delivery of a lesson.

**Learning Indicator (LI) 2:** Discuss, develop and review assessment tasks with rubrics for the individual project.

## 2.0 Reviewing the Learning Plan (20 minutes)

- 2.1 Upload your completed learning plan into the subject-specific App. Have a chat with your App to verify the following and discuss their suitability to reflect the diverse needs of learners in your class (NTS 1a, 2b, 2c and 3e-3q).

*E.g.*

### **Differentiation**

*Review the differentiation strategies and the assessment tasks. Suggest specific improvements to enhance their clarity, relevance, and effectiveness in meeting the needs of slow learners.*

#### **Hint**



Continue chatting with your App to verify the following and use the responses to complete your plan

- a. assessment tasks
- b. essential questions
- c. learning activities, etc.

## **3.0 Prepare to Assign, Assess and Record for the Student Transcript Portal (50 minutes)**

- 3.1** Refer to your Teacher Manual for the key assessment to be recorded in the Student Transcript Portal and have a chat with the subject-specific App to review or develop your assessment tasks and mark schemes/rubrics (NTS 2a–2c, 2e–2h and 3j–3q).

*E.g.*

*With reference to Appendix E of the Teacher Manual, develop individual project assessment tasks for learners. Provide rubrics for scoring, suggest guidelines for administering the task and giving feedback to learners.*



#### **Note**

*One chat may not be enough for the App to provide all that you may need for the tasks*

- 3.2** Have a chat with your App to verify the suggested assessment tasks and discuss the suitability of the responses from activity 3.1. Use the suggestions to refine the assessment tasks (NTS 1a, 2b, 2c and 3e–3q). In doing this activity, consider:

*E.g.*

#### **i. Task**

*Review assessment tasks to enable learners complete the individual project by Week 22*

**ii. Mark scheme and score distribution**

*Review the rubrics to provide clear guidance for grading learner responses.*

**iii. Resources needed for assessment administration**

*Suggest resources needed for the smooth administration of the individual project*

**iv. How to provide feedback**

*Suggest feedback guidelines for learners during and after the assessment*

## **4.0 Reflection (10 minutes)**

**4.1** Reflect and share your views on the session (NTS 1a, 1b).

**4.2** Identify a colleague to observe your lesson in relation to PLC Session 13 to provide feedback on your lesson (NTS 1f, 1g).

**4.3** Remember to:

- a.** mark, record and upload your learners' assessment scores in the Student Transcript Portal (NTS 3j, 3n).
- b.** read PLC Session 14, Teacher Manual and related Learner Material (NTS 3a).
- c.** bring along your laptop, Teacher Manual and PLC Handbook in preparation for the next session (NTS 3a).
- d.** identify areas you found challenging in your teaching and administration of the assessment for discussion during the next session.

# PLC Session 14: Creating 2D and 3D models in AutoCAD

## 1.0 Introduction (5 minutes)

- 1.1 Share one thing you applied in your classroom based on PLC Session 13
  - a. the challenges you faced
  - b. how you addressed them
- 1.2 Have you developed your learning plan for week 14?
  - a. If you answered **yes**, conduct your PLC Session from Activity 2.0B
  - b. If you answered **no**, conduct your PLC Session from Activity 2.0A

### Hint



You cannot conduct PLC on Activity 2.0B if you **have not** prepared your learning plan

## 2.0A Planning and Reviewing of Learning Plan (50 minutes)

**Purpose:** The purpose for this session is to populate the learning planner for week 14 on *creating 2D and 3D models in AutoCAD* using the subject specific App.

**Learning Outcome (LO):** To populate the learning planner with the essential questions, differentiation, learning activities and key assessments and use the subject specific App to review your populated learning plan (NTS 2b, 2c, 2e, 2f, 3a, 3d, 3e, 3g-3k and 3o).

**Learning Indicator (LI) 1:** Populate the learning planner using the subject specific App

**Learning Indicator (LI) 2:** Enact an activity from your reviewed learning plan.

**2.1** Refer to your Teacher Manual and have a chat with your subject specific App to develop your learning plan for Week 14 on creating 2D and 3D models in AutoCAD (NTS 1a, 2b, 2c, 2e–2h and 3a–3q).

*E.g.*

**i. Essential questions**

*Create essential questions that guide beginners in understanding how to navigate the AutoCAD interface and use basic drawing commands to create accurate 2D technical drawings and 3D models*

**ii. Differentiation**

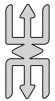
*Develop differentiation strategies to support learners with varying computer skills in using AutoCAD, providing step-by-step tutorials for beginners while offering advanced modelling challenges for proficient users*

**iii. Learning activities**

*Design hands-on learning activities that engage learners in creating simple 2D technical drawings and basic 3D models using AutoCAD's drawing tools, coordinate systems, and modelling commands*

**iv. Assessment tasks**

*Create practical assessment tasks that allow learners to demonstrate their ability to create both 2D drawings and 3D models of mechanical components using AutoCAD software*



**Note**

- i.** Chatting once may not be enough for the App to provide all that you may need for the tasks
- ii.** Transfer the information from your SS App into your learning planner template to complete your plans.
- iii.** Chat with your App to learn how to integrate National Values, GESI, SEL and 21<sup>st</sup> century skills in your learning activities, assessment tasks and rubrics/mark scheme.

**Hint**



Move to Activity 3.0

## 2.0B Reviewing the Learning Plan and Addressing Challenges in Planning, Delivering and Assessing Lessons (50 minutes)

**Purpose:** To support teachers address challenges they may have during lesson preparation and delivery.

**Learning Outcome (LO):** To address specific concerns of teachers in planning, teaching and assessment.

**Learning Indicator (LI) 1:** Address challenges in the preparation and delivery of a lesson.

**Learning Indicator (LI) 2:** Enact an activity in preparation to teach the lesson.

- 2.1** Upload your completed learning plan into the subject specific App. Have a chat with your App to verify the following and discuss their suitability to reflect the diverse needs of learners in your class (NTS 1a, 2b, 2c and 3e–3q).

*E.g.*

### **Learning activities**

*Review the learning activities in learning plan on creating 2D and 3D models in AutoCAD with the teacher manual and suggest areas for improvement to help learners who have never used CAD software before feel confident and successful, etc.*

### **Hint**



Continue chatting with your App to verify the following and use the responses to complete your plan

- a. essential questions
- b. differentiation
- c. assessment tasks, etc.



### **Note**

- i. Chatting once may not be enough for the App to provide all that you may need for the tasks
- ii. Transfer the information from your SS App into your learning planner template to complete your plans
- iii. Chat with your App to learn how to integrate National Values, GESI, SEL and 21<sup>st</sup> century skills in your learning activities, assessment tasks and rubrics/mark scheme.

**2.2** Identify a challenging area or issue and chat with your subject specific App for steps on how to address it for effective lesson delivery (NTS 3j).

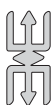
**2.3** Share your experience with the group.

### **3.0 Enactment (25 minutes)**

**3.1** Enact a teaching activity in your plan (NTS 1b, 1f, 1g, 2c, 2e, 2f and 3c–3j).

**3.2** Reflect on the activity enacted to improve lesson delivery (NTS 1a).

**3.3** Ask for feedback on the activity enacted (NTS 1a, 1e, 2c and 3o).



#### **Note**

*You may record the enacted activity.*

### **4.0 Reflection (10 minutes)**

**4.1** Reflect and share your views on the session (NTS 1a, 1b).

**4.2** Identify a colleague to observe your lesson in relation to PLC Session 14 to provide feedback on your lesson (NTS 1f, 1g).

**4.3** Remember to:

- a.** read PLC Session 15, Teacher Manual and related Learner Material (NTS 3a).
- b.** bring along your laptop, Teacher Manual and PLC Handbook in preparation for the next session (NTS 3a).
- c.** identify areas you found challenging in your teaching for discussion during the next session.

# PLC Session 15: Difference between measuring instruments and using measuring tools to measure work pieces

## 1.0 Introduction (5 minutes)

- 1.1 Share one thing you applied in your classroom based on PLC Session 14
  - a. the challenges you faced
  - b. how you addressed them
- 1.2 Have you developed your learning plan for week 15?
  - a. If you answered **yes**, conduct your PLC Session from Activity 2.0B
  - b. If you answered **no**, conduct your PLC Session from Activity 2.0A

### Hint



You cannot conduct PLC on Activity 2.0B if you **have not** prepared your learning plan

## 2.0A Planning and Reviewing of Learning Plan (50 minutes)

**Purpose:** The purpose for this session is to populate the learning planner for week 15 on *difference between measuring instruments and using measuring tools to measure work pieces* using the subject specific App.

**Learning Outcome (LO):** To populate the learning planner with the essential questions, differentiation, learning activities and key assessments and use the subject specific App to review your populated learning plan (NTS 2b, 2c, 2e, 2f, 3a, 3d, 3e, 3g–3k and 3o).

**Learning Indicator (LI) 1:** Populate the learning planner using the subject specific App

**Learning Indicator (LI) 2:** Enact an activity from your reviewed learning plan.

- 2.1** Refer to your Teacher Manual and have a chat with your subject specific App to develop your learning plan for Week 15 on difference between measuring instruments and using measuring tools to measure work pieces (NTS 1a, 2b, 2c, 2e–2h and 3a–3q).

*E.g.*

**i. Essential questions**

*Create essential questions that help learners understand the importance of accurate measurement in manufacturing and how different measuring instruments are selected for specific applications and precision requirements*

**ii. Differentiation**

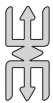
*Design differentiated strategies to help learners with different levels of manual dexterity and experience use various measuring instruments correctly, providing visual guides and hands-on practice opportunities*

**iii. Learning activities**

*Develop two practical learning activities for week 15 that engage learners in using different measuring instruments to measure real objects and understand measurement accuracy and precision*

**iv. Assessment tasks**

*Create practical assessment tasks that allow learners to demonstrate their ability to select appropriate measuring instruments, take accurate measurements, and interpret measurement results for quality control purposes*



**Note**

- i.** Chatting once may not be enough for the App to provide all that you may need for the tasks
- ii.** Transfer the information from your SS App into your learning planner template to complete your plans.
- iii.** Chat with your App to learn how to integrate National Values, GESI, SEL and 21<sup>st</sup> century skills in your learning activities, assessment tasks and rubrics/mark scheme.

**Hint**

Move to Activity 3.0

## 2.0B Reviewing the Learning Plan and Addressing Challenges in Planning, Delivering and Assessing Lessons (50 minutes)

**Purpose:** To support teachers address challenges they may have during lesson preparation and delivery.

**Learning Outcome (LO):** To address specific concerns of teachers in planning, teaching and assessment.

**Learning Indicator (LI) 1:** Address challenges in the preparation and delivery of a lesson.

**Learning Indicator (LI) 2:** Enact an activity in preparation to teach the lesson.

- 2.1** Upload your completed learning plan into the subject specific App. Have a chat with your App to verify the following and discuss their suitability to reflect the diverse needs of learners in your class (NTS 1a, 2b, 2c and 3e–3q).

*E.g.*

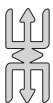
### ***Differentiation***

*Review the differentiation strategies in the learning plan to effectively support learners who have difficulty with precise manual operations when using measuring instruments, and suggest improvements where necessary, etc.*

**Hint**

Continue chatting with your App to verify the following and use the responses to complete your plan

- a. essential questions
- b. learning activities
- c. assessment tasks, etc.

**Note**

- i. Chatting once may not be enough for the App to provide all that you may need for the tasks

- ii. *Transfer the information from your SS App into your learning planner template to complete your plans*
- iii. *Chat with your App to learn how to integrate National Values, GESI, SEL and 21<sup>st</sup> century skills in your learning activities, assessment tasks and rubrics/mark scheme.*

**2.2** Identify a challenging area or issue and chat with your subject specific App for steps on how to address it for effective lesson delivery (NTS 3j).

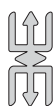
**2.3** Share your experience with the group.

### **3.0 Enactment (25 minutes)**

**3.1** Enact a teaching activity in your plan (NTS 1b, 1f, 1g, 2c, 2e, 2f and 3c-3j).

**3.2** Reflect on the activity enacted to improve lesson delivery (NTS 1a).

**3.3** Ask for feedback on the activity enacted (NTS 1a, 1e, 2c and 3o).



#### **Note**

*You may record the enacted activity.*

### **4.0 Reflection (10 minutes)**

**4.1** Reflect and share your views on the session (NTS 1a, 1b).

**4.2** Identify a colleague to observe your lesson in relation to PLC Session 15 to provide feedback on your lesson (NTS 1f, 1g).

**4.3** Remember to:

- a. read PLC Session 16, Teacher Manual and related Learner Material (NTS 3a).
- b. bring along your laptop, Teacher Manual and PLC Handbook in preparation for the next session (NTS 3a).
- c. identify areas you found challenging in your teaching for discussion during the next session.

# PLC Session 16: Difference between manual–hand tools and power hand tools and application of hand tools in manufacturing

## 1.0 Introduction (5 minutes)

- 1.1 Share one thing you applied in your classroom based on PLC Session 15
  - a. the challenges you faced
  - b. how you addressed them
- 1.2 Have you developed your learning plan for week 16?
  - a. If you answered **yes**, conduct your PLC Session from Activity 2.0B
  - b. If you answered **no**, conduct your PLC Session from Activity 2.0A

### Hint



You cannot conduct PLC on Activity 2.0B if you **have not** prepared your learning plan

## 2.0A Planning and Reviewing of Learning Plan (50 minutes)

**Purpose:** The purpose for this session is to populate the learning planner for week 16 on *difference between manual–hand tools and power hand tools and application of hand tools in manufacturing* using the subject specific App.

**Learning Outcome (LO):** To populate the learning planner with the essential questions, differentiation, learning activities and key assessments and use the subject specific App to review your populated learning plan (NTS 2b, 2c, 2e, 2f, 3a, 3d, 3e, 3g–3k and 3o).

**Learning Indicator (LI) 1:** Populate the learning planner using the subject specific App

**Learning Indicator (LI) 2:** Enact an activity from your reviewed learning plan.

- 2.1** Refer to your Teacher Manual and have a chat with your subject specific App to develop your learning plan for Week 16 on difference between manual–hand tools and power hand tools and application of hand tools in manufacturing (NTS 1a, 2b, 2c, 2e–2h and 3a–3q).

*E.g.*

**i. Essential questions**

*Create essential questions that help learners understand the difference between manual–hand tools and power hand tools and the application of hand tools in manufacturing*

**ii. Differentiation**

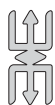
*Design strategies to help learners with different levels of workshop experience safely handle and operate both manual and power hand tools, providing extra safety guidance for beginners while challenging experienced learners with advanced techniques*

**iii. Learning activities**

*Develop hands–on learning activities that engage learners in identifying, selecting, and safely using various manual tools (hammers, screwdrivers, wrenches) and power tools (drills, grinders, sanders) for practical manufacturing tasks*

**iv. Assessment tasks**

*Create practical assessment tasks that allow learners to demonstrate their ability to understand the difference between manual–hand tools and power hand tools and the application of hand tools in manufacturing*



**Note**

- i.** Chatting once may not be enough for the App to provide all that you may need for the tasks
- ii.** Transfer the information from your SS App into your learning planner template to complete your plans.
- iii.** Chat with your App to learn how to integrate National Values, GESI, SEL and 21<sup>st</sup> century skills in your learning activities, assessment tasks and rubrics/mark scheme.

**Hint**

Move to Activity 3.0

## 2.0B Reviewing the Learning Plan and Addressing Challenges in Planning, Delivering and Assessing Lessons (50 minutes)

**Purpose:** To support teachers address challenges they may have during lesson preparation and delivery.

**Learning Outcome (LO):** To address specific concerns of teachers in planning, teaching and assessment.

**Learning Indicator (LI) 1:** Address challenges in the preparation and delivery of a lesson.

**Learning Indicator (LI) 2:** Enact an activity in preparation to teach the lesson.

- 2.1** Upload your completed learning plan into the subject specific App. Have a chat with your App to verify the following and discuss their suitability to reflect the diverse needs of learners in your class (NTS 1a, 2b, 2c and 3e–3q).

*E.g.*

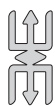
### **Learning activities**

*Review and revise the learning activities in the learning plan to effectively help learners differentiate between manual–hand tools and power hand tools, and the application of hand tools in manufacturing, etc.*

**Hint**

Continue chatting with your App to verify the following and use the responses to complete your plan

- a. essential questions
- b. differentiation
- c. assessment tasks, etc.



### Note

- i. Chatting once may not be enough for the App to provide all that you may need for the tasks
- ii. Transfer the information from your SS App into your learning planner template to complete your plans.
- iii. Chat with your App to learn how to integrate National Values, GESI, SEL and 21<sup>st</sup> century skills in your learning activities, assessment tasks and rubrics/mark scheme.

**2.2** Identify a challenging area or issue and chat with your subject specific App for steps on how to address it for effective lesson delivery (NTS 3j).

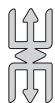
**2.3** Share your experience with the group.

## 3.0 Enactment (25 minutes)

**3.1** Enact a teaching activity in your plan (NTS 1b, 1f, 1g, 2c, 2e, 2f and 3c-3j).

**3.2** Reflect on the activity enacted to improve lesson delivery (NTS 1a).

**3.3** Ask for feedback on the activity enacted (NTS 1a, 1e, 2c and 3o).



### Note

*You may record the enacted activity.*

## 4.0 Reflection (10 minutes)

**4.1** Reflect and share your views on the session (NTS 1a, 1b).

**4.2** Identify a colleague to observe your lesson in relation to PLC Session 16 to provide feedback on your lesson (NTS 1f, 1g).

**4.3** Remember to:

- a. read PLC Session 17, Teacher Manual and related Learner Material (NTS 3a).
- b. bring along your laptop, Teacher Manual and PLC Handbook in preparation for the next session (NTS 3a).
- c. identify areas you found challenging in your teaching for discussion during the next session.

# PLC Session 17: Importance of casting in manufacturing engineering products

## 1.0 Introduction (5 minutes)

- 1.1 Share one thing you applied in your classroom based on PLC Session 16
  - a. the challenges you faced
  - b. how you addressed them
- 1.2 Have you developed your learning plan for week 17?
  - a. If you answered **yes**, conduct your PLC Session from Activity 2.0B
  - b. If you answered **no**, conduct your PLC Session from Activity 2.0A

### Hint



You cannot conduct PLC on Activity 2.0B if you **have not** prepared your learning plan

## 2.0A Planning and Reviewing of Learning Plan (50 minutes)

**Purpose:** The purpose for this session is to populate the learning planner for week 17 on *importance of casting in manufacturing engineering products* using the subject specific App.

**Learning Outcome (LO):** To populate the learning planner with the essential questions, differentiation, learning activities and key assessments and use the subject specific App to review your populated learning plan (NTS 2b, 2c, 2e, 2f, 3a, 3d, 3e, 3g–3k and 3o).

**Learning Indicator (LI) 1:** Populate the learning planner using the subject specific App

**Learning Indicator (LI) 2:** Enact an activity from your reviewed learning plan.

**2.1** Refer to your Teacher Manual and have a chat with your subject specific App to develop your learning plan for Week 17 on importance of casting in manufacturing engineering products (NTS 1a, 2b, 2c, 2e-2h and 3a-3q).

*E.g.*

**i. Essential questions**

*Give 4 essential questions to guide teaching and learning that help learners understand the importance of casting in manufacturing engineering products*

**ii. Differentiation**

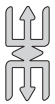
*Design differentiation strategies to help learners with different learning styles grasp casting concepts through visual demonstrations, hands-on moulding activities, and real-world examples of cast products they encounter daily*

**iii. Learning activities**

*Develop interactive learning activities that engage learners in exploring the casting process through simple demonstrations, examining cast products, and understanding the advantages of casting over other manufacturing methods*

**iv. Assessment tasks**

*Develop group work assessment tasks that allow learners to investigate and present on different types of casting processes and their applications in various industries, demonstrating their understanding of casting's importance*



**Note**

- i.** Chatting once may not be enough for the App to provide all that you may need for the tasks
- ii.** Transfer the information from your SS App into your learning planner template to complete your plans.
- iii.** Chat with your App to learn how to integrate National Values, GESI, SEL and 21<sup>st</sup> century skills in your learning activities, assessment tasks and rubrics/mark scheme.

**Hint**



Move to Activity 3.0

## 2.0B Reviewing the Learning Plan and Addressing Challenges in Planning, Delivering and Assessing Lessons (50 minutes)

**Purpose:** To support teachers address challenges they may have during lesson preparation and delivery.

**Learning Outcome (LO):** To address specific concerns of teachers in planning, teaching and assessment.

**Learning Indicator (LI) 1:** Address challenges in the preparation and delivery of a lesson.

**Learning Indicator (LI) 2:** Enact an activity in preparation to teach the lesson.

- 2.1** Upload your completed learning plan into the subject specific App. Have a chat with your App to verify the following and discuss their suitability to reflect the diverse needs of learners in your class (NTS 1a, 2b, 2c and 3e–3q).

*E.g.*

### **Assessment tasks**

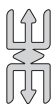
*Review the group work assessment tasks in the learning plan to determine if they effectively support diverse learners in understanding the importance of casting in manufacturing engineering products, etc.*

### **Hint**



Continue chatting with your App to verify the following and use the responses to complete your plan

- a. essential questions
- b. differentiation
- c. Learning tasks, etc.



### **Note**

- i. Chatting once may not be enough for the App to provide all that you may need for the tasks
- ii. Transfer the information from your SS App into your learning planner template to complete your plans
- iii. Chat with your App to learn how to integrate National Values, GESI, SEL and 21<sup>st</sup> century skills in your learning activities, assessment tasks and rubrics/mark scheme.

**2.2** Identify a challenging area or issue and chat with your subject specific App for steps on how to address it for effective lesson delivery (NTS 3j).

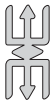
**2.3** Share your experience with the group.

### **3.0 Enactment (25 minutes)**

**3.1** Enact a teaching activity in your plan (NTS 1b, 1f, 1g, 2c, 2e, 2f and 3c–3j).

**3.2** Reflect on the activity enacted to improve lesson delivery (NTS 1a).

**3.3** Ask for feedback on the activity enacted (NTS 1a, 1e, 2c and 3o).



#### **Note**

*You may record the enacted activity.*

### **4.0 Reflection (10 minutes)**

**4.1** Reflect and share your views on the session (NTS 1a, 1b).

**4.2** Identify a colleague to observe your lesson in relation to PLC Session 17 to provide feedback on your lesson (NTS 1f, 1g).

**4.3** Remember to:

- a.** read PLC Session 18, Teacher Manual and related Learner Material (NTS 3a).
- b.** bring along your laptop, Teacher Manual and PLC Handbook in preparation for the next session (NTS 3a).
- c.** identify areas you found challenging in your teaching for discussion during the next session.

# PLC Session 18: Preparing for Mid-Semester Examination

## 1.0 Introduction (10 minutes)

- 1.1 Share one thing on assessment in PLC Session 17 that you
  - a. applied in your lesson delivery
  - b. found challenging and how you addressed it.
- 1.2 Share one challenge you encountered while populating your learning plan for week 18 before the session that you would like to discuss during this PLC session.
- 1.3 Read and discuss the Purpose, Learning Outcome (LO) and Learning Indicators (LIs) for the session.

**Purpose:** The purpose of this session is to use the subject-specific App to

1. review the completed learning plan for week 18
2. prepare assessment tasks and rubrics for mid-semester examination

**Learning Outcome (LO):** To review the learning plan for week 18 and address any challenges in planning and developing assessment tasks for the mid-semester examination (NTS 2b, 2c, 2e, 2f, 3a, 3d, 3e, 3g-3k and 3o).

**Learning Indicator (LI) 1:** Review the learning plan and address challenges in the preparation and delivery of a lesson.

**Learning Indicator (LI) 2:** Discuss, develop and review assessment tasks with rubrics for the mid-semester examination.

## 2.0 Reviewing the Learning Plan (20 minutes)

- 2.1 Upload your learning plan into the subject-specific App. Have a chat with your App to verify the following and discuss their suitability to reflect the diverse needs of learners in your class (NTS 1a, 2b, 2c and 3e-3q).

*E.g.*

### **Learning activities**

*Review the learning activities in the attached learning plan to align with what is required in the teacher manual.*

#### **Hint**



Continue chatting with your App to verify the following and use the responses to complete your plan

- a. essential questions
- b. differentiation
- c. assessment tasks, etc.

## **3.0 Prepare for Mid-Semester Examination (50 minutes)**

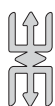
- 3.1** Refer to your Teacher Manual for the format of the mid-semester examination and use the subject-specific App to review or develop your assessment tasks, mark schemes/rubrics, etc. (NTS 2a-2c, 2e-2h and 3j-3q).

*E.g.*

*The Teacher Manual recommends that the end of semester examination in Week 12 should contain 40 multiple-choice and 3 essay-type questions distributed 30%, 40% and 30% across DoK levels 1, 2 and (3 & 4). Develop:*

- a. 40 multiple-choice questions (with options listed alphabetically)
- b. essay-type questions
- c. Mark scheme for the examination

*The examination is for 1 hour. The developed assessment tasks should align with the learning indicators in weeks 13 to 17.*



#### **Note**

*In preparing for mid-semester examination, one chat may not be enough for the App to provide all you need (DoK levels, structure, distribution across DoK levels, etc.)*

- 3.2** Have a chat with your App to review the suggested assessment tasks and discuss the suitability of the responses from activity 3.1. Use the review to refine the responses and complete the set questions (NTS 1a, 2b, 2c and 3e–3q). In doing this activity, consider:

*E.g.*

- i. Whether the assessment tasks generated follow 30%, 40%, 30% DoK distribution**

*Review the assessment tasks to align with the DOK distribution of 30%, 40%, 30%. Suggest appropriate modifications to the assessment tasks if any.*

- ii. Mark scheme and score distribution**

*Provide a comprehensive mark scheme with appropriate score distributions for the questions.*

- iii. Resources needed for assessment administration**

*Suggest resources appropriate and easily accessible for the administration of mid-semester examinations*

- iv. How to provide feedback**

*Give appropriate feedback mechanisms to communicate back to my learners after scoring.*

## 4.0 Reflection (10 minutes)

- 4.1** Reflect and share your views on the session (NTS 1a, 1b).

- 4.2** Identify a colleague to observe your lesson in relation to PLC Session 18 to provide feedback on your lesson (NTS 1f, 1g).

- 4.3** Remember to:

- a.** mark, record and upload your learners' assessment scores in the Student Transcript Portal.
- b.** read PLC Session 19, Teacher Manual and related Learner Material (NTS 3a).
- c.** bring along your laptop, Teacher Manual and PLC Handbook in preparation for the next session (NTS 3a).
- d.** identify areas you found challenging in your planning and administration of the assessment for discussion during the next session.

# PLC Session 19: Non-permanent and permanent joining processes

## 1.0 Introduction (5 minutes)

- 1.1 Share one thing you applied in your classroom based on PLC Session 18
  - a. the challenges you faced
  - b. how you addressed them
- 1.2 Have you developed your learning plan for week 19?
  - a. If you answered **yes**, conduct your PLC Session from Activity 2.0B
  - b. If you answered **no**, conduct your PLC Session from Activity 2.0A

### Hint



You cannot conduct PLC on Activity 2.0B if you **have not** prepared your learning plan

## 2.0A Planning and Reviewing of Learning Plan (50 minutes)

**Purpose:** The purpose for this session is to populate the learning planner for week 19 on *non-permanent and permanent joining processes* using the subject specific App.

**Learning Outcome (LO):** To populate the learning planner with the essential questions, differentiation, learning activities and key assessments and use the subject specific App to review your populated learning plan (NTS 2b, 2c, 2e, 2f, 3a, 3d, 3e, 3g-3k and 3o).

**Learning Indicator (LI) 1:** Populate the learning planner using the subject specific App

**Learning Indicator (LI) 2:** Enact an activity from your reviewed learning plan.

- 2.1** Refer to your Teacher Manual and have a chat with your subject specific App to develop your learning plan for Week 19 on non-permanent and permanent joining processes (NTS 1a, 2b, 2c, 2e-2h and 3a-3q).

*E.g.*

**i. Essential questions**

*Create three essential questions that help learners understand the fundamental differences between non-permanent joining processes (screws, bolts, clips) and permanent joining processes (welding, brazing, soldering) and when to use each type*

**ii. Differentiation**

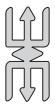
*Using the teacher and learner manuals, design strategies to help learners with different technical backgrounds identify and classify joining methods through hands-on examination of real components and visual comparisons of joint types*

**iii. Learning activities**

*Develop three learning activities that engage learners in creating functional objects using both permanent and non-permanent joining techniques, allowing them to experience the practical differences between these methods*

**iv. Assessment tasks**

*Create two debate assessment tasks that help learners analyse how non-permanent and permanent joining processes influence the efficiency and sustainability of manufacturing practices, demonstrating critical thinking about joining method selection*



**Note**

- i.** Chatting once may not be enough for the App to provide all that you may need for the tasks
- ii.** Transfer the information from your SS App into your learning planner template to complete your plans.
- iii.** Chat with your App to learn how to integrate National Values, GESI, SEL and 21<sup>st</sup> century skills in your learning activities, assessment tasks and rubrics/mark scheme.

**Hint**

Move to Activity 3.0



## 2.0B Reviewing the Learning Plan and Addressing Challenges in Planning, Delivering and Assessing Lessons (50 minutes)

**Purpose:** To support teachers address challenges they may have during lesson preparation and delivery.

**Learning Outcome (LO):** To address specific concerns of teachers in planning, teaching and assessment.

**Learning Indicator (LI) 1:** Address challenges in the preparation and delivery of a lesson.

**Learning Indicator (LI) 2:** Enact an activity in preparation to teach the lesson.

- 2.1** Upload your completed learning plan into the subject specific App. Have a chat with your App to verify the following and discuss their suitability to reflect the diverse needs of learners in your class (NTS 1a, 2b, 2c and 3e-3q).

*E.g.*

### **Learning activities**

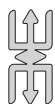
*Review the learning activities in the learning plan regarding joining processes, utilising teacher and learner manuals. Suggest areas for improvement to help learners with limited workshop experience participate successfully in creating functional objects, etc.*

### **Hint**



Continue chatting with your App to verify the following and use the responses to complete your plan

- a. essential questions
- b. differentiation
- c. assessment tasks, etc.



### **Note**

- i. Chatting once may not be enough for the App to provide all that you may need for the tasks
- ii. Transfer the information from your SS App into your learning planner template to complete your plans
- iii. Chat with your App to learn how to integrate National Values, GESI, SEL and 21<sup>st</sup> century skills in your learning activities, assessment tasks and rubrics/mark scheme.

**2.2** Identify a challenging area or issue and chat with your subject specific App for steps on how to address it for effective lesson delivery (NTS 3j).

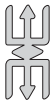
**2.3** Share your experience with the group.

### **3.0 Enactment (25 minutes)**

**3.1** Enact a teaching activity in your plan (NTS 1b, 1f, 1g, 2c, 2e, 2f and 3c–3j).

**3.2** Reflect on the activity enacted to improve lesson delivery (NTS 1a).

**3.3** Ask for feedback on the activity enacted (NTS 1a, 1e, 2c and 3o).



#### **Note**

*You may record the enacted activity.*

### **4.0 Reflection (10 minutes)**

**4.1** Reflect and share your views on the session (NTS 1a, 1b).

**4.2** Identify a colleague to observe your lesson in relation to PLC Session 19 to provide feedback on your lesson (NTS 1f, 1g).

**4.3** Remember to:

- a.** read PLC Session 20, Teacher Manual and related Learner Material (NTS 3a).
- b.** bring along your laptop, Teacher Manual and PLC Handbook in preparation for the next session (NTS 3a).
- c.** identify areas you found challenging in your teaching for discussion during the next session.

# PLC Session 20: Join components using screw, bolt and nut and welding processes

## 1.0 Introduction (5 minutes)

- 1.1 Share one thing you applied in your classroom based on PLC Session 19
  - a. the challenges you faced
  - b. how you addressed them
- 1.2 Have you developed your learning plan for week 20?
  - a. If you answered **yes**, conduct your PLC Session from Activity 2.0B
  - b. If you answered **no**, conduct your PLC Session from Activity 2.0A

### Hint



You cannot conduct PLC on Activity 2.0B if you **have not** prepared your learning plan

## 2.0A Planning and Reviewing of Learning Plan (50 minutes)

**Purpose:** The purpose for this session is to populate the learning planner for week 20 on *joining components using screw, bolt and nut and welding processes* using the subject specific App.

**Learning Outcome (LO):** To populate the learning planner with the essential questions, differentiation, learning activities and key assessments and use the subject specific App to review your populated learning plan (NTS 2b, 2c, 2e, 2f, 3a, 3d, 3e, 3g–3k and 3o).

**Learning Indicator (LI) 1:** Populate the learning planner using the subject specific App

**Learning Indicator (LI) 2:** Enact an activity from your reviewed learning plan.

- 2.1** Refer to your Teacher Manual and have a chat with your subject specific App to develop your learning plan for Week 20 on joining components using screw, bolt and nut and welding processes (NTS 1a, 2b, 2c, 2e–2h and 3a–3q).

*E.g.*

**i. Essential questions**

*Create essential questions that help learners understand the proper sequence and safety procedures for joining components using mechanical fasteners and welding, and when each method is most appropriate*

**ii. Differentiation**

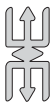
*Design strategies to help learners with varying skill levels safely practice joining techniques, providing step-by-step guidance for beginners while offering complex assembly challenges for advanced learners*

**iii. Learning activities**

*Develop experiential learning activities that engage learners in hands-on practice of forming non-permanent joints using screws, bolts, and nuts, and joining manufactured parts using available welding processes in mixed-ability groups*

**iv. Assessment tasks**

*Create three display and exhibition assessment tasks that allow learners to design and build assemblies using various joining methods (rivets, screws, studs, bolts, and nuts) while documenting their process and demonstrating technical skills*



**Note**

- i.** Chatting once may not be enough for the App to provide all that you may need for the tasks
- ii.** Transfer the information from your SS App into your learning planner template to complete your plans.
- iii.** Chat with your App to learn how to integrate National Values, GESI, SEL and 21<sup>st</sup> century skills in your learning activities, assessment tasks and rubrics/mark scheme.

**Hint**

Move to Activity 3.0



## 2.0B Reviewing the Learning Plan and Addressing Challenges in Planning, Delivering and Assessing Lessons (50 minutes)

**Purpose:** To support teachers address challenges they may have during lesson preparation and delivery.

**Learning Outcome (LO):** To address specific concerns of teachers in planning, teaching and assessment.

**Learning Indicator (LI) 1:** Address challenges in the preparation and delivery of a lesson.

**Learning Indicator (LI) 2:** Enact an activity in preparation to teach the lesson.

- 2.1** Upload your completed learning plan into the subject specific App. Have a chat with your App to verify the following and discuss their suitability to reflect the diverse needs of learners in your class (NTS 1a, 2b, 2c and 3e–3q).

*E.g.*

### **Learning activities**

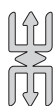
*Revise the learning activities in the learning plan to effectively support learners who are nervous about using welding equipment, and suggest modifications to build their confidence while maintaining safety standards, etc.*

### **Hint**



Continue chatting with your App to verify the following and use the responses to complete your plan

- a. essential questions
- b. differentiation
- c. assessment tasks, etc.



### **Note**

- i. Chatting once may not be enough for the App to provide all that you may need for the tasks
- ii. Transfer the information from your SS App into your learning planner template to complete your plans
- iii. Chat with your App to learn how to integrate National Values, GESI, SEL and 21<sup>st</sup> century skills in your learning activities, assessment tasks and rubrics/mark scheme.

**2.2** Identify a challenging area or issue and chat with your subject specific App for steps on how to address it for effective lesson delivery (NTS 3j).

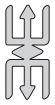
**2.3** Share your experience with the group.

### **3.0 Enactment (25 minutes)**

**3.1** Enact a teaching activity in your plan (NTS 1b, 1f, 1g, 2c, 2e, 2f and 3c–3j).

**3.2** Reflect on the activity enacted to improve lesson delivery (NTS 1a).

**3.3** Ask for feedback on the activity enacted (NTS 1a, 1e, 2c and 3o).



#### **Note**

*You may record the enacted activity.*

### **4.0 Reflection (10 minutes)**

**4.1** Reflect and share your views on the session (NTS 1a, 1b).

**4.2** Identify a colleague to observe your lesson in relation to PLC Session 20 to provide feedback on your lesson (NTS 1f, 1g).

**4.3** Remember to:

- a.** read PLC Session 21, Teacher Manual and related Learner Material (NTS 3a).
- b.** bring along your laptop, Teacher Manual and PLC Handbook in preparation for the next session (NTS 3a).
- c.** identify areas you found challenging in your teaching for discussion during the next session.

# PLC Session 21: Types of hazard control

## 1.0 Introduction (5 minutes)

- 1.1 Share one thing you applied in your classroom based on PLC Session 20
  - a. the challenges you faced
  - b. how you addressed them
- 1.2 Have you developed your learning plan for week 21?
  - a. If you answered **yes**, conduct your PLC Session from Activity 2.0B
  - b. If you answered **no**, conduct your PLC Session from Activity 2.0A

### Hint



You cannot conduct PLC on Activity 2.0B if you **have not** prepared your learning plan

## 2.0A Planning and Reviewing of Learning Plan (50 minutes)

**Purpose:** The purpose for this session is to populate the learning planner for week 21 on *types of hazard control* using the subject specific App.

**Learning Outcome (LO):** To populate the learning planner with the essential questions, differentiation, learning activities and key assessments and use the subject specific App to review your populated learning plan (NTS 2b, 2c, 2e, 2f, 3a, 3d, 3e, 3g–3k and 3o).

**Learning Indicator (LI) 1:** Populate the learning planner using the subject specific App

**Learning Indicator (LI) 2:** Enact an activity from your reviewed learning plan.

- 2.1 Refer to your Teacher Manual and have a chat with your subject specific App to develop your learning plan for Week 21 on types of hazard control (NTS 1a, 2b, 2c, 2e–2h and 3a–3q).

*E.g.*

**i. Essential questions**

*Give two essential questions that help learners understand the hierarchy of hazard controls (elimination, substitution, engineering controls, administrative controls, PPE) and how to apply them effectively in manufacturing environments*

**ii. Differentiation**

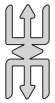
*Design strategies to help learners with different safety awareness levels grasp hazard control concepts through role-playing scenarios, visual demonstrations, and hands-on practice with safety equipment*

**iii. Learning activities**

*Develop two learning activities that engage learners visiting manufacturing companies to observe hazard control measures firsthand and create comprehensive hazard control plans for local manufacturing environments*

**iv. Assessment tasks**

*Create 5 questioning assessment tasks that help learners demonstrate their knowledge of hazard control types and their ability to select appropriate control measures for specific manufacturing hazards with rubric for scoring*



**Note**

- i.** Chatting once may not be enough for the App to provide all that you may need for the tasks
- ii.** Transfer the information from your SS App into your learning planner template to complete your plans.
- iii.** Chat with your App to learn how to integrate National Values, GESI, SEL and 21<sup>st</sup> century skills in your learning activities, assessment tasks and rubrics/mark scheme.

**Hint**



Move to Activity 3.0

## 2.0B Reviewing the Learning Plan and Addressing Challenges in Planning, Delivering and Assessing Lessons (50 minutes)

**Purpose:** To support teachers address challenges they may have during lesson preparation and delivery.

**Learning Outcome (LO):** To address specific concerns of teachers in planning, teaching and assessment.

**Learning Indicator (LI) 1:** Address challenges in the preparation and delivery of a lesson.

**Learning Indicator (LI) 2:** Enact an activity in preparation to teach the lesson.

- 2.1** Upload your completed learning plan into the subject specific App. Have a chat with your App to verify the following and discuss their suitability to reflect the diverse needs of learners in your class (NTS 1a, 2b, 2c and 3e–3q).

*E.g.*

### **Learning activities**

*Review the learning activities in the learning plan on types of hazard control with the teacher and learner manuals. Suggest areas for improvement to help learners who may be uncomfortable with safety discussions feel more engaged and confident, etc.*

### **Hint**



Continue chatting with your App to verify the following and use the responses to complete your plan

- a. essential questions
- b. differentiation
- c. assessment tasks, etc.



### **Note**

- i. Chatting once may not be enough for the App to provide all that you may need for the tasks
- ii. Transfer the information from your SS App into your learning planner template to complete your plans
- iii. Chat with your App to learn how to integrate National Values, GESI, SEL and 21<sup>st</sup> century skills in your learning activities, assessment tasks and rubrics/mark scheme.

**2.2** Identify a challenging area or issue and chat with your subject specific App for steps on how to address it for effective lesson delivery (NTS 3j).

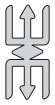
**2.3** Share your experience with the group.

### 3.0 Enactment (25 minutes)

**3.1** Enact a teaching activity in your plan (NTS 1b, 1f, 1g, 2c, 2e, 2f and 3c–3j).

**3.2** Reflect on the activity enacted to improve lesson delivery (NTS 1a).

**3.3** Ask for feedback on the activity enacted (NTS 1a, 1e, 2c and 3o).



#### Note

*You may record the enacted activity.*

### 4.0 Reflection (10 minutes)

**4.1** Reflect and share your views on the session (NTS 1a, 1b).

**4.2** Identify a colleague to observe your lesson in relation to PLC Session 21 to provide feedback on your lesson (NTS 1f, 1g).

**4.3** Remember to:

- a.** read PLC Session 22, Teacher Manual and related Learner Material (NTS 3a).
- b.** bring along your laptop, Teacher Manual and PLC Handbook in preparation for the next session (NTS 3a).
- c.** identify areas you found challenging in your teaching for discussion during the next session.

# PLC Session 22: Effect of manufacturing on the environment

## 1.0 Introduction (5 minutes)

- 1.1 Share one thing you applied in your classroom based on PLC Session 21
  - a. the challenges you faced
  - b. how you addressed them
- 1.2 Have you developed your learning plan for week 22?
  - a. If you answered **yes**, conduct your PLC Session from Activity 2.0B
  - b. If you answered **no**, conduct your PLC Session from Activity 2.0A

### Hint



You cannot conduct PLC on Activity 2.0B if you **have not** prepared your learning plan

## 2.0A Planning and Reviewing of Learning Plan (50 minutes)

**Purpose:** The purpose for this session is to populate the learning planner for week 22 on *effect of manufacturing on the environment* using the subject specific App.

**Learning Outcome (LO):** To populate the learning planner with the essential questions, differentiation, learning activities and key assessments and use the subject specific App to review your populated learning plan (NTS 2b, 2c, 2e, 2f, 3a, 3d, 3e, 3g–3k and 3o).

**Learning Indicator (LI) 1:** Populate the learning planner using the subject specific App

**Learning Indicator (LI) 2:** Enact an activity from your reviewed learning plan.

- 2.1** Refer to your Teacher Manual and have a chat with your subject specific App to develop your learning plan for Week 22 on effect of manufacturing on the environment (NTS 1a, 2b, 2c, 2e–2h and 3a–3q).

*E.g.*

**i. Essential questions**

*Create essential questions that help learners understand effect of manufacturing on the environment*

**ii. Differentiation**

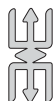
*Design strategies to help learners with different environmental awareness levels grasp complex concepts like pollution, resource depletion, and climate change through visual aids, local examples, and hands-on investigations*

**iii. Learning activities**

*Develop learning activities that help learners to understand the effect of manufacturing on the environment*

**iv. Assessment tasks**

*Create case study assessment tasks that challenge learners to analyse real-world scenarios of manufacturing environmental impacts (like textile wastewater discharge) and propose solutions to address water quality, ecosystem, and public health concerns*



**Note**

- i.** Chatting once may not be enough for the App to provide all that you may need for the tasks
- ii.** Transfer the information from your SS App into your learning planner template to complete your plans.
- iii.** Chat with your App to learn how to integrate National Values, GESI, SEL and 21<sup>st</sup> century skills in your learning activities, assessment tasks and rubrics/mark scheme.

**Hint**

Move to Activity 3.0



## 2.0B Reviewing the Learning Plan and Addressing Challenges in Planning, Delivering and Assessing Lessons (50 minutes)

**Purpose:** To support teachers address challenges they may have during lesson preparation and delivery.

**Learning Outcome (LO):** To address specific concerns of teachers in planning, teaching and assessment.

**Learning Indicator (LI) 1:** Address challenges in the preparation and delivery of a lesson.

**Learning Indicator (LI) 2:** Enact an activity in preparation to teach the lesson.

- 2.1** Upload your completed learning plan into the subject specific App. Have a chat with your App to verify the following and discuss their suitability to reflect the diverse needs of learners in your class (NTS 1a, 2b, 2c and 3e–3q).

*E.g.*

### **Assessment tasks**

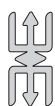
*Review the assessment tasks in the learning plan on the environmental effects of manufacturing with the teacher and learner manuals. Suggest areas for improvement to help struggling learners analyse complex environmental scenarios and develop practical solutions, etc.*

### **Hint**



Continue chatting with your App to verify the following and use the responses to complete your plan

- a. essential questions
- b. differentiation
- c. learning activities, etc.



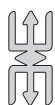
### **Note**

- i. Chatting once may not be enough for the App to provide all that you may need for the tasks
- ii. Transfer the information from your SS App into your learning planner template to complete your plans
- iii. Chat with your App to learn how to integrate National Values, GESI, SEL and 21<sup>st</sup> century skills in your learning activities, assessment tasks and rubrics/mark scheme.

- 1.2** Identify a challenging area or issue and chat with your subject specific App for steps on how to address it for effective lesson delivery (NTS 3j).
- 1.3** Share your experience with the group.

### **3.0 Enactment (25 minutes)**

- 3.1** Enact a teaching activity in your plan (NTS 1b, 1f, 1g, 2c, 2e, 2f and 3c–3j).
- 3.2** Reflect on the activity enacted to improve lesson delivery (NTS 1a).
- 3.3** Ask for feedback on the activity enacted (NTS 1a, 1e, 2c and 3o).



#### **Note**

*You may record the enacted activity.*

### **4.0 Reflection (10 minutes)**

- 4.1** Reflect and share your views on the session (NTS 1a, 1b).
- 4.2** Identify a colleague to observe your lesson in relation to PLC Session 22 to provide feedback on your lesson (NTS 1f, 1g).
- 4.3** Remember to:
  - a.** read PLC Session 23, Teacher Manual and related Learner Material (NTS 3a).
  - b.** bring along your laptop, Teacher Manual and PLC Handbook in preparation for the next session (NTS 3a).
  - c.** identify areas you found challenging in your teaching for discussion during the next session.

# PLC Session 23: Benefits of using environmentally friendly processes and products in manufacturing

## 1.0 Introduction (5 minutes)

- 1.1 Share one thing you applied in your classroom based on PLC Session 22
  - a. the challenges you faced
  - b. how you addressed them
- 1.2 Have you developed your learning plan for week 233?
  - a. If you answered **yes**, conduct your PLC Session from Activity 2.0B
  - b. If you answered **no**, conduct your PLC Session from Activity 2.0A

### Hint



You cannot conduct PLC on Activity 2.0B if you **have not** prepared your learning plan

## 2.0A Planning and Reviewing of Learning Plan (50 minutes)

**Purpose:** The purpose for this session is to populate the learning planner for week 23 on *benefits of using environmentally friendly processes and products in manufacturing* using the subject specific App.

**Learning Outcome (LO):** To populate the learning planner with the essential questions, differentiation, learning activities and key assessments and use the subject specific App to review your populated learning plan (NTS 2b, 2c, 2e, 2f, 3a, 3d, 3e, 3g–3k and 3o).

**Learning Indicator (LI) 1:** Populate the learning planner using the subject specific App

**Learning Indicator (LI) 2:** Enact an activity from your reviewed learning plan.

- 2.1** Refer to your Teacher Manual and have a chat with your subject specific App to develop your learning plan for Week 23 on benefits of using environmentally friendly processes and products in manufacturing (NTS 1a, 2b, 2c, 2e-2h and 3a-3q).

*E.g.*

**i. Essential questions**

*Suggest essential questions that help learners understand benefits of using environmentally friendly processes and products in manufacturing*

**ii. Differentiation**

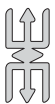
*Design strategies to help learners with different levels of environmental awareness grasp the multiple benefits of sustainable manufacturing through real-world examples, visual comparisons, and hands-on activities*

**iii. Learning activities**

*Develop experiential learning activities that engage learners in watching videos comparing environmentally friendly and conventional manufacturing processes, then creating visual presentations using flashcards, charts, and mappings to illustrate the benefits*

**iv. Assessment tasks**

*Create six assessment tasks that allow learners to creatively demonstrate their understanding of the benefits of using environmentally friendly processes and products in manufacturing*



**Note**

- i.** Chatting once may not be enough for the App to provide all that you may need for the tasks
- ii.** Transfer the information from your SS App into your learning planner template to complete your plans.
- iii.** Chat with your App to learn how to integrate National Values, GESI, SEL and 21<sup>st</sup> century skills in your learning activities, assessment tasks and rubrics/mark scheme.

**Hint**



Move to Activity 3.0

## 2.0B Reviewing the Learning Plan and Addressing Challenges in Planning, Delivering and Assessing Lessons (50 minutes)

**Purpose:** To support teachers address challenges they may have during lesson preparation and delivery.

**Learning Outcome (LO):** To address specific concerns of teachers in planning, teaching and assessment.

**Learning Indicator (LI) 1:** Address challenges in the preparation and delivery of a lesson.

**Learning Indicator (LI) 2:** Enact an activity in preparation to teach the lesson.

- 2.1** Upload your completed learning plan into the subject specific App. Have a chat with your App to verify the following and discuss their suitability to reflect the diverse needs of learners in your class (NTS 1a, 2b, 2c and 3e–3q).

*E.g.*

**Essential questions**

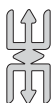
*Review the essential questions in the learning plan to match with week 23 learning indicator and focal area, etc.*

### Hint



Continue chatting with your App to verify the following and use the responses to complete your plan

- a. Learning activities
- b. differentiation
- c. assessment tasks, etc.



### Note

- i. Chatting once may not be enough for the App to provide all that you may need for the tasks
- ii. Transfer the information from your SS App into your learning planner template to complete your plans
- iii. Chat with your App to learn how to integrate National Values, GESI, SEL and 21<sup>st</sup> century skills in your learning activities, assessment tasks and rubrics/mark scheme.

**2.2** Identify a challenging area or issue and chat with your subject specific App for steps on how to address it for effective lesson delivery (NTS 3j).

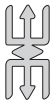
**2.3** Share your experience with the group.

### **3.0 Enactment (25 minutes)**

**3.1** Enact a teaching activity in your plan (NTS 1b, 1f, 1g, 2c, 2e, 2f and 3c–3j).

**3.2** Reflect on the activity enacted to improve lesson delivery (NTS 1a).

**3.3** Ask for feedback on the activity enacted (NTS 1a, 1e, 2c and 3o).



#### **Note**

*You may record the enacted activity.*

### **4.0 Reflection (10 minutes)**

**4.1** Reflect and share your views on the session (NTS 1a, 1b).

**4.2** Identify a colleague to observe your lesson in relation to PLC Session 23 to provide feedback on your lesson (NTS 1f, 1g).

**4.3** Remember to:

- a.** read PLC Session 24, Teacher Manual and related Learner Material (NTS 3a).
- b.** bring along your laptop, Teacher Manual and PLC Handbook in preparation for the next session (NTS 3a).
- c.** identify areas you found challenging in your teaching for discussion during the next session.

# PLC Session 24: Preparing for End of Semester Examination

## 1.0 Introduction (10 minutes)

- 1.1 Share one thing on assessment in PLC Session 23 that you
  - a. applied in your lesson delivery
  - b. found challenging and how you addressed it.
- 1.2 Share one challenge you encountered while populating your learning plan for week 24 before the session that you would like to discuss during this PLC session.
- 1.3 Read and discuss the Purpose, Learning Outcome (LO) and Learning Indicators (LIs) for the session.

**Purpose:** The purpose of this session is to use the subject-specific App to

1. review the completed learning plan for week 24
2. prepare assessment tasks and rubrics for end of semester examination

**Learning Outcome (LO):** To review the learning plan for week 24 and address any challenges in planning and developing assessment tasks for the end of semester examination (NTS 2b, 2c, 2e, 2f, 3a, 3d, 3e, 3g-3k and 3o).

**Learning Indicator (LI) 1:** Review the learning plan and address challenges in the preparation and delivery of a lesson.

**Learning Indicator (LI) 2:** Discuss, develop and review assessment tasks with rubrics for the end of semester examination.

## 2.0 Reviewing the Learning Plan (20 minutes)

- 2.1 Upload your learning plan into the subject-specific App. Have a chat with your App to verify the following and discuss their suitability to reflect the diverse needs of learners in your class (NTS 1a, 2b, 2c and 3e-3q).

*E.g.*

### **Assessment task**

*Review differentiation strategies to support struggling learners*

#### **Hint**



Continue chatting with your App to verify the following and use the responses to complete your plan

- a. essential questions
- b. differentiation
- c. learning activities, etc.

## **3.0 Prepare for End of Semester Examination (50 minutes)**

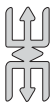
- 3.1** Refer to your Teacher Manual for the format of the end of semester examination and use the subject-specific App to review or develop your assessment tasks, mark schemes/rubrics, etc. (NTS 2a-2c, 2e-2h and 3j-3q).

*E.g.*

*The Teacher Manual recommends that the end of semester examination in Week 24 should contain 40 multiple-choice and 2 essay-type questions distributed 30%, 40% and 30% across DoK levels 1, 2 and (3 & 4). Develop:*

- a. 40 multiple-choice questions (with options listed alphabetically)
- b. 2 essay-type questions
- c. Mark scheme for the examination

*The examination is for 2 hours. The assessment tasks developed should align with the learning indicators in weeks 13 to 24.*



#### **Note**

*In preparing for end of semester examination, one chat may not be enough for the App to provide all you need (DoK levels, structure, distribution across DoK levels, etc.)*

- 3.2** Have a chat with your App to review the suggested assessment tasks and discuss the suitability of the responses from activity 3.1. Use the review to refine the responses and complete the set questions (NTS 1a, 2b, 2c and 3e-3q). In doing this activity, consider:

*E.g.*

- i. Whether the assessment tasks generated follow 30%, 40%, 30% DoK distribution**  
*Review assessment tasks for DOK level 3 questions to form 30% of the examination*
- ii. Mark scheme and score distribution**  
*Develop mark scheme for scoring the exams.*
- iii. Resources needed for assessment administration**  
*Give resources needed for the smooth conduct of the examination.*
- iv. How to provide feedback**  
*Suggest areas to include when providing feedback to learners on the examination.*

## **4.0 Reflection (10 minutes)**

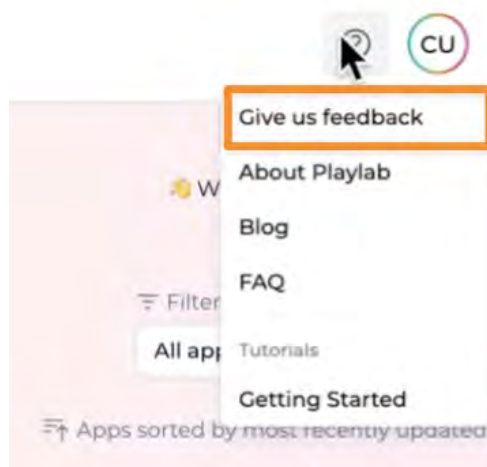
- 4.1** Reflect and share your views on the session (NTS 1a, 1b).
- 4.2** Identify a colleague to observe your lesson in relation to PLC Session 24 to provide feedback on your lesson (NTS 1f, 1g).
- 4.3** Remember to mark, record and upload your learners' assessment scores in the Student Transcript Portal.

# Appendix 1: Subject Specific App Teaching & Learning Apps – Issue Reporting Guide

## How to Report Issues or Get Support

You have three ways to report issues with the subject-specific apps:

1. Email Support
  - For general issues: Send email to: [support@playlab.ai](mailto:support@playlab.ai)
  - Include:
  - Your school name and region
  - Subject app you're using
  - Description of the issue
  - Screenshots or screen recordings (if possible)
  - Best for: School administrators reporting multiple app issues
  - Response time: Within 24 hours
  - If Urgent please include [URGENT] Message Text in your subject line.
2. Submit Feedback in Playlab
  - In the app, Click the “Give us Feedback” link in the menu and share feedback.



- Access the Feedback Form here
- Complete the form and upload any supporting documentation. (The more detailed your submission is, the more helpful support will be)



## User Feedback Form

We want to hear your feedback and learn more about how we can improve Playlab for you. *Please complete this form to submit your feedback to the Playlab team.*

**Full Name\***

Your answer

**Email\***

Your answer

**What is your role?\***

Your answer

**Please share your feedback**

What challenge are you facing? What feature would you like to see?

Your answer

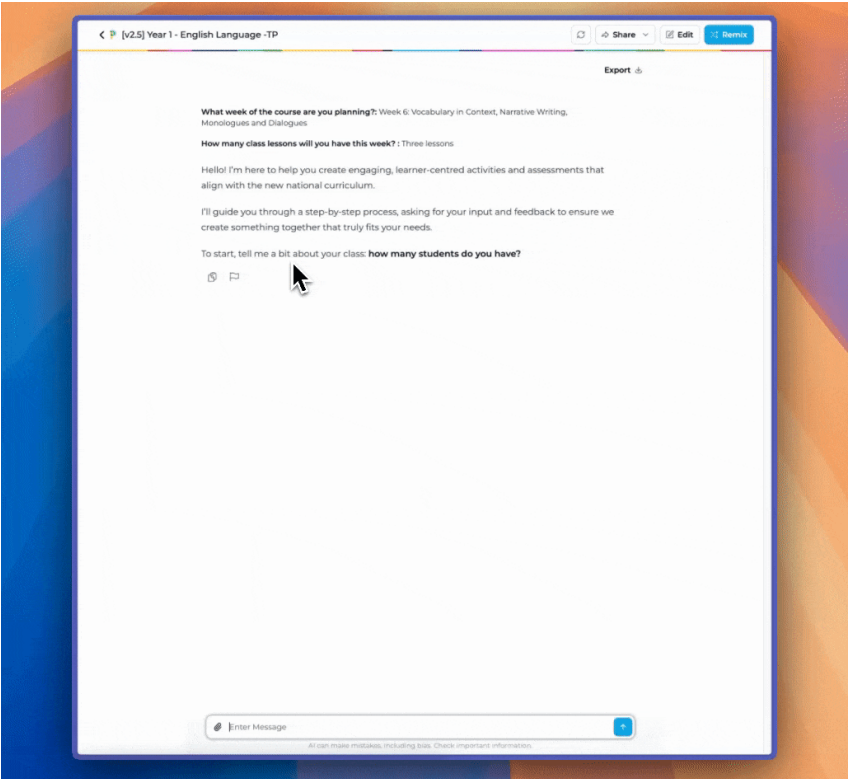
**Please share any screenshots or videos that help visualize your feedback.**

 **Upload** Size limit: 100 MB. File limit: 10.

**Submit**

Never submit sensitive personal information, like passwords, through Notion Forms.  
[Report abuse](#)

- Best for: Individual teachers reporting specific issues
  - Response time: Within 24–48 hours
3. In-Chat Flagging
- Look for the flag button within your chat conversation



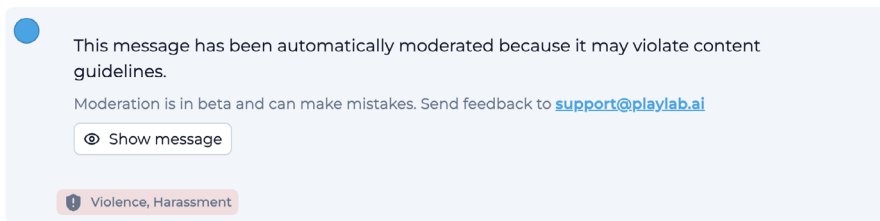
- Click to report biased, inaccurate, or inappropriate messages.
- Best for: Immediate issues with app responses
- There is also in app moderation for both user messages and AI generated responses. You can read more about it here.

What Happens After You Report?

1. The message will be flagged in your user activity. You will see indicators of messages that have been moderated or flagged.

|                                                                                  |                                     |
|----------------------------------------------------------------------------------|-------------------------------------|
| KIPP NYC Restorative Plan Designer                                               | 8/21/2025                           |
| <div><div>A3C</div><div></div><div></div><div></div><div></div><div></div></div> | <div><div>7</div><div>1</div></div> |
| KIPP NYC Restorative Plan Designer                                               | 8/21/2025                           |
| <div><div>A3C</div><div></div><div></div><div></div><div></div><div></div></div> | <div><div>5</div></div>             |
| KIPP NYC Restorative Plan Designer                                               | 8/15/2025                           |
| <div><div>M</div><div></div><div></div><div></div><div></div><div></div></div>   | <div><div>7</div><div>1</div></div> |

2. You can review the messages in activity. By default the message is hidden unless you click “show message”.



Thank you for sharing the details of the incident. Here's the step-by-step analysis and proposed restorative plan based on the provided situation:

3. If something is consistently being flagged, you may want to address it in your implementation, make revisions to the app, or contact [support@playlab.ai](mailto:support@playlab.ai) for more guidance.

Tips for Effective Reporting:

- Be specific about what you were trying to do
- Note which subject app you're using
- Include your school and region information
- Describe what happened versus what you expected

## Additional Support Resources

### 1 App Basics:

- Starting a conversation
  - Scan your QR code to use your app.
- If you encounter a problem, follow the directions for Escalating an issue.

### Video Tutorials

- a Lesson Planning Walkthrough: Step-by-step guide using a real subject app with sample conversations
  - Lesson Plan Development
    - Watch a sample conversation [here](#).
    - As you're using the apps, you can provide specifics on how you might want to differentiate for class needs
  - Assessment Development
    - Watch a sample conversation [here](#).

- As you're using the apps, you can adjust the DOK levels as you create assessments at different complexity levels
- b For any additional questions please refer to the [learn.playlab.ai](https://learn.playlab.ai) page.

## Key Reminders

- 1 Apps are supplemental tools to support your PLC Handbook and Teacher Manual—not replace them
- 2 Always refer to official curriculum documents as your primary resource
- 3 Use your professional judgment to adapt app suggestions for your classroom context

## Appendix 2: Learning Planner Template

|                                                                                                                                                     |  |      |  |          |  |      |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|--|------|--|----------|--|------|--|
| <b>Name of Subject:</b>                                                                                                                             |  |      |  |          |  |      |  |
| Learning Planner Template Year Two                                                                                                                  |  |      |  |          |  |      |  |
| Number of Learners in Class                                                                                                                         |  | Week |  | Duration |  | Form |  |
| Strand                                                                                                                                              |  |      |  |          |  |      |  |
| Sub-Strand                                                                                                                                          |  |      |  |          |  |      |  |
| Content Standard                                                                                                                                    |  |      |  |          |  |      |  |
| Learning Outcome(s)                                                                                                                                 |  |      |  |          |  |      |  |
| Learning Indicator(s)                                                                                                                               |  |      |  |          |  |      |  |
| Essential Question(s)                                                                                                                               |  |      |  |          |  |      |  |
| Pedagogical Strategies                                                                                                                              |  |      |  |          |  |      |  |
| Teaching & Learning Resources                                                                                                                       |  |      |  |          |  |      |  |
| <b>Key Notes on Differentiation</b><br>Identify the different learner needs in your class and make notes on how to cater for them during the lesson |  |      |  |          |  |      |  |
|                                                                                                                                                     |  |      |  |          |  |      |  |
| <b>Lesson</b><br>(complete per number of lessons for the week)                                                                                      |  |      |  |          |  |      |  |
| <b>Refer to the Teacher Manual and Learner Material to complete this section</b>                                                                    |  |      |  |          |  |      |  |
| Introduction<br>Main Lesson<br>Closure                                                                                                              |  |      |  |          |  |      |  |

| Key Assessment       |                                                                                                                                     |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| 1.                   | <div>Formative</div> <div>Assessment Mode:</div> <div>Task:</div> <div>Mark Scheme:</div>                                           |
| 2.                   | <div>Key Assessment for Student Transcript Portal</div> <div>Assessment Mode:</div> <div>Task:</div> <div>Rubric/Mark Scheme:</div> |
| Reflection & Remarks |                                                                                                                                     |
|                      |                                                                                                                                     |

# Appendix 3: Teacher Lesson Observation Form

## Teacher Lesson Observation Form

Name of School

Subject being observed

Class

|                    |        |        |        |
|--------------------|--------|--------|--------|
|                    | Year 1 | Year 2 | Year 3 |
| Sex of the teacher | Male   | Female |        |

1. Is the purpose of the lesson clearly stated in the lesson plan and focused on learners achieving the lesson learning outcomes?

Yes In Part No NA

b1. Please provide an explanation to your answer in Q1 above

2. Are the unique needs of female learners, male learners, and learners with special education needs adequately catered for in the lesson plan? For example, the choice of teaching methods and learning activities reflects/does not reflect the learning needs of all learners.

*For example, the choice of teaching methods, and learning activities.*

Yes In Part No NA

2b. Please provide an explanation to your answer in Q2 above

3. Does the teacher manage behavior well, maintaining a positive and non-threatening learning environment throughout the lesson?

Yes                      In Part                      No                      NA

3b. Please provide an explanation to your answer in Q3 above

4. Are appropriate teaching and learning materials and other resources (including ICT, books, desks) available, accessible and being used to support learning of all females, males and learners with special education needs?

Yes                      In Part                      No                      NA

4b. Please provide an explanation to your answer in Q4 above

5. Are learners engaged on tasks that challenge them in line with the content standards?

*Does the teacher take into consideration the uniqueness of learners?*

Yes                      In Part                      No                      NA

5b. Please provide an explanation to your answer in Q5 above

6. Is there evidence that students are learning?

Yes                      In Part                      No                      NA

6b. Please provide an explanation to your answer in Q6 above

7. Is teaching differentiated to cater for the varied needs of all learners (i.e., male learners, female learners, learners with special education needs) and those with poor literacy and/ or numeracy proficiency?

Yes                      In Part                      No                      NA

7b. Please provide an explanation to your answer in Q7 above

8. Does the teacher use real life examples which are familiar to learners to explain concepts?

Yes                      In Part                      No                      NA

8b. Please provide an explanation to your answer in Q8 above

9. Does the teacher point out or question traditional gender roles when they come up during the lessons as appropriate?

Yes                      In Part                      No                      NA

9b. Please provide an explanation to your answer in Q9 above

10. Does the lesson include appropriate interactive and creative approaches e.g., group work, role play, storytelling to support learners achieving the learning outcomes?

*If yes, give examples of the issues and skills that have been so integrated.*

Yes                      In Part                      No                      NA

10b. Please provide an explanation to your answer in Q10 above

11. Have cross-cutting issues and /or 21st century skills been integrated into the lesson to support learners in achieving the learning outcomes e.g., problem-solving, critical thinking, communication? If yes, give examples of the issues and skills that have been so integrated.

Yes                      In Part                      No                      NA

11b. If yes, give examples of the issues and skills that have been so integrated.

12. Does the teacher incorporate ICT into their practice to support learning?

Yes                      In Part                      No                      NA

12b. Please provide an explanation to your answer in Q12 above

13. Does the teacher encourage all female male and male learners (including those who may be shy or afraid to speak) to ask questions, answer questions, participate in group work, etc. during the lesson?

Yes                      In Part                      No                      NA

13b. Please provide an explanation to your answer in Q13 above

14. Is assessment evident in the lesson? If yes, does it include assessment as, for or of learning and go beyond recall?

*If yes, did it include assessment of, for or as learning and go beyond recall?*

Yes                      In Part                      No                      NA

14b. Please provide an explanation to your answer in Q14 above

15. Do learners make use of feedback from teacher and peers?

Yes

In Part

No

NA

15b. Please provide an explanation to your answer in Q15 above

16. Does the teacher sum up the lesson and evaluate the lesson against the learning outcomes with the learners?

Yes

In Part

No

NA

16b. Please provide an explanation to your answer in Q16 above

17. Does the teachers' planning of lessons taught before the one observed show how they plan for learning over time, considering individual and group needs?

Yes

In Part

No

NA

17b. Please provide an explanation to your answer in Q17 above

18. Does the teacher pay attention to the composition of females and males during group work and assigns females leadership roles.

Yes

In Part

No

NA

18b. Please provide an explanation to your answer in Q18 above

19. Does the teacher provide constructive verbal feedback to both females and males and learners with special education needs?

Yes

In Part

No

NA

19b. Please provide an explanation to your answer in Q19 above

20. Does the teacher provide constructive written feedback to both females and males and learners with special education needs in their exercise book?

Yes

In Part

No

NA

20b. Please provide an explanation to your answer in Q20 above

21. Key strengths in the lesson

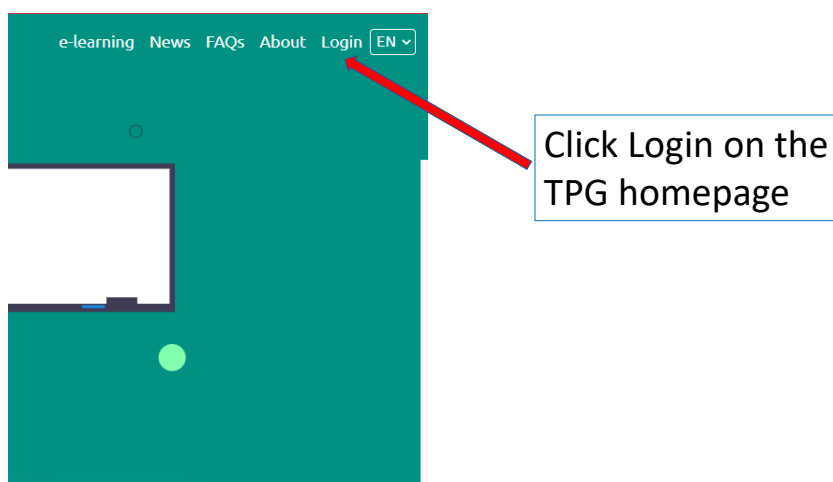
22. Areas for development

23. Next steps for teacher

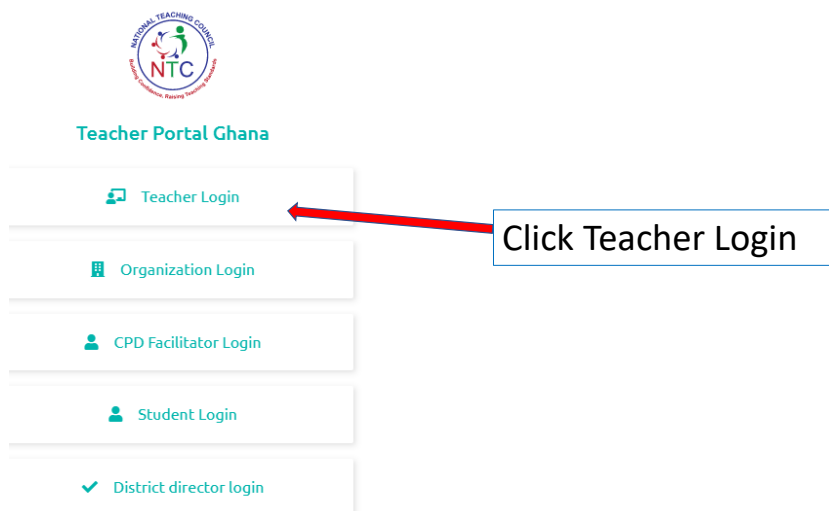
Additional Notes (on teacher's actions, the flow of activities, etc.)

# Appendix 4: How to check CPD Points and Training Records on Teacher Portal Ghana

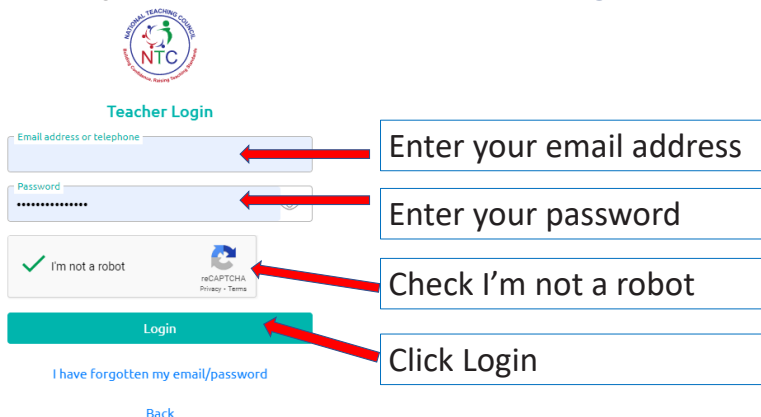
## 1. Visit [tpg.ntc.gov.gh](http://tpg.ntc.gov.gh) and click Login



## 2. On the Login page, click Teacher Login



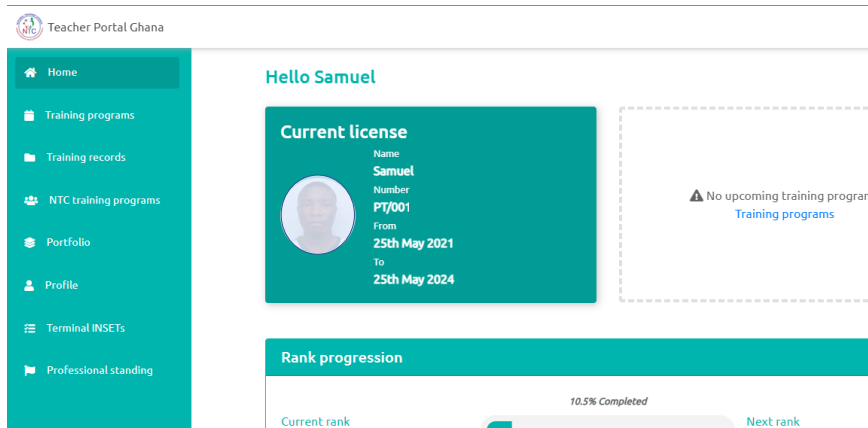
### 3. On the **Teacher Login** page enter your email address and password and then click **Login**



The image shows the Teacher Login page with the following elements and annotations:

- Teacher Login** (Page Title)
- Email address or telephone** (Input field) → **Enter your email address**
- Password** (Input field) → **Enter your password**
- I'm not a robot** (Captcha) → **Check I'm not a robot**
- Login** (Button) → **Click Login**
- [I have forgotten my email/password](#)
- [Back](#)

### 4. After a successful login you will get access to your **TPG account** (Check image below)



The image shows the Teacher Portal Ghana dashboard for a user named Samuel. The dashboard includes the following sections:

- Header:** Teacher Portal Ghana
- Left Sidebar:**
  - Home
  - Training programs
  - Training records
  - NTC training programs
  - Portfolio
  - Profile
  - Terminal INSETs
  - Professional standing
- Main Content Area:**
  - Hello Samuel**
  - Current license**
    - Name: Samuel
    - Number: PT/001
    - From: 25th May 2021
    - To: 25th May 2024
  - Rank progression**
    - Current rank
    - 10.5% Completed
    - Next rank
  - No upcoming training program** (Warning message with [Training programs](#) link)

5. To check CPD points, scroll down to **Rank progression**. You will see the CPD points progress bar and actual points accrued (Check image below)



6. To view training records, from the side menu tap on **Training records** (Check image below)

The image shows the 'Teacher Portal Ghana' interface. On the left is a teal sidebar menu with options: Home, Training programs, Training records, NTC training programs, Portfolio, Profile, Terminal INSETs, and Professional standing. A red arrow points from the 'Training records' menu item to a label. The main content area is titled 'Training records' and shows 'Records for training programs registered and/or attended'. It lists three programs: 'Sensitization on Education Policies' (Marked as absent), 'Differentiated Learning' (Processed, Credits: 1.32), and 'Advanced Mobile Learning with Multimedia (AMLJM)' (Processed, Credits: 0.5788). A red bracket groups these programs with a label.

Teacher Portal Ghana

Training records

Records for training programs registered and/or attended

Total points: 1.8988

| Training Program                                 | Status           | Credits |
|--------------------------------------------------|------------------|---------|
| Sensitization on Education Policies              | Marked as absent |         |
| Differentiated Learning                          | Processed        | 1.32    |
| Advanced Mobile Learning with Multimedia (AMLJM) | Processed        | 0.5788  |

Click to view training records

List of training programs

# THANK YOU

