Learning Plan (Types of Data)							
Subject	*Mathematics*	**Week**	*21*	**Duration**		**Form**	*1*
Strand	*Making Sense of and Using Data*	**Sub-Strand**	*Statistical reasoning and its application in real life*				
Content Standard	*Demonstrate conceptual understanding of the appropriateness of data collection methods to collect everyday life data.*						
Learning Outcome(s)	*Decide whether or not a selected data collection method is appropriate given a particular data, justify responses, and collect both qualitative and quantitative data with the appropriate methods.*						
Learning Indicator(s)	*a) Classify data (primary and secondary) as quantitative (discrete and continuous), qualitative (nominal and ordinal), numerical, categorical, grouped, ungrouped, etc.* *b) Identify and validate quantitative data collection methods (Survey/Questionnaire, Interviews, Observation, Existing Data, and Probability) and use it to collect everyday-life data.* *c) Identify and validate qualitative data collection methods (interviews, observations, focus groups, oral histories, online tracking, social media monitoring, etc.) and use it to collect everyday-life data.*						
Essential Question(s)	*(A) How are the different types of data, including qualitative (categorical) data and quantitative (numerical) data, distinguished based on their characteristics and measurement scales?* *(B) What are the various methods used to collect quantitative data, such as surveys, experiments, and observations, and how can these methods be validated to ensure the accuracy and reliability of the data?* *(C) What are the different methods used to collect qualitative data, such as interviews, focus groups, and content analysis, and how can these methods be validated to ensure the credibility and trustworthiness of the data?*						
Pedagogical Strategies	*Experiential Learning, Problem – Based Learning, Collaborative Learning.*						
Teaching & Learning Resources	*Calculator, whiteboard, marker, Mathematics Teacher Manual (Page 64 – 71), NTS handbook, Concise Core Mathematics Textbook (Page 252 – 296), Presentation slides, charts, tables, worksheets for data classification, real – world datasets.*						

Key Notes on Differentiation

Learning Tasks:

a) Learners differentiate among the different types of data
b) Learners organise given data into frequency tables
c) Learners research and select an existing survey questionnaire, observation guide, etc., then discuss its features, validate its usefulness and collect quantitative data with it.
d) Learners design a mini project where they choose a data collection method of choice and collect real-life quantitative data with it.

Pedagogical Approach: *Experiential learning;*
Learners to embark on a mini-project within the school environment by researching and selecting an existing survey questionnaire, interview guide, observation guide, etc., then discuss its features, validate its usefulness and collect quantitative/qualitative data with it.

To differentiate:

a) You may have to support some learners in researching and obtaining the research tool. Where learners are capable, provide support for them to construct the tool themselves and help them validate it.

To ensure that all learners participate fully, you may consider the following;

b) *Choice of Data Collection Tool: Offer students a range of options for data collection tools to suit different preferences and skill levels. This could include surveys, interviews, or observations. Allow students to choose the method that aligns best with their interests and strengths.*

c) *Flexible Grouping: Allow students to work individually, in pairs, or in small groups based on their preferences and the complexity of the project. This accommodates varying levels of collaboration and allows students to support one another in the validation and data collection processes.*

d) *Provide resources and support materials at different levels of complexity to accommodate diverse learning needs. This could include step-by-step guides, video tutorials, or examples of validated data collection tools. Ensure that students have access to the resources they need to succeed at their chosen level.*

Key assessment

a) Assessment Level 2

The data below are the scores of 21 learners in a creative arts test. Organise it into a frequency distribution table by grouping them. 59, 65, 61, 62, 53, 55, 60, 70, 64, 56, 58, 58, 62, 62, 68, 65, 56, 59, 68, 61, 67

b) Assessment Level 3

1. *Select an existing survey questionnaire and discuss its features.*
2. *Validate the questionnaire and collect a quantitative data with it.*

Keywords	*Primary Data, Secondary Data, Quantitative Data, Qualitative Data, Discrete Data, Continuous Data, Nominal, Ordinal, Numerical, Categorical, Grouped and Ungrouped Data, Data Collection Methods: Survey, Interviews, Validation, Accuracy, Reliability.*

Lesson 1

Main Lesson drawing on Concepts, Skills, and Competencies to reinforce as in the Subject Teacher Manual

Teacher Activity	***Learner Activity***
Starter ***Activity (e.g., 10 minutes)*** ***Teacher Activity:*** *Using data hunting game, write a variety of data types on different cards and task learners to sort the cards under given headings and justify their reason for the sorting.* ***Learner Activity:*** *Learners work in pairs to sort the cards under given headings and justify their reasons.*	
Introductory Activity (e.g., 15minutes) *Present a brief overview of data classification using a presentation or whiteboard, explaining primary vs. secondary data and qualitative vs. quantitative data using real – world examples such as survey results, census data, etc.* ***Activity 1 (e.g., 45 minutes)*** ❖ *Using talk for learning provide a clear definition of the types of data (primary, secondary, qualitative, quantitative, grouped, ungrouped, discrete and continuous) with examples.*	***Introductory Activity*** *Learners pay attention, take key notes, asks questions for clarity and understanding.* ***Activity 1*** • *Learners pay attention and take key notes of the definitions with examples.*

❖ *Demonstrate to learners how to create frequency tables for grouped vs. ungrouped data using sample data sets.* ❖ *Demonstrate to learners how to classify data using visual aids like charts, tables, and diagrams.* ***Activity 2 (e.g., 40 minutes)*** ❖ *Using talk for learning, discuss and draw out the differences, with examples, between discrete and continuous data, nominal, and ordinal data, etc.* ❖ *In mixed ability and gender groupings, present learners with data sets and assign them to classify them into their appropriate categories.* ***Hint:*** *Circulate among the groups to supervise work, offer help, and correct misconceptions.* ❖ *Using talk for learning, discuss with learners about the importance of each type of data classification in real – life applications.*	• *Learners follow along with the demonstration and take key notes.* • *Learners follow along with the demonstration and take notes.* ***Activity 2*** • *Learners pay attention and take key notes among the differences with examples.* • *Learners in their respective groups, classify data samples assigned to them in their appropriate categories and present their classification to the class.* • *Learners listen with rapt attention about the importance of data classification in real – life applications.*
Assessment DoK aligned to the Curriculum and Subject Teacher Manual	
Assessment Level 2: *1. Describe each of the following data types as primary or secondary data.* *• interviews* *• reports* *• experiments* *• observations* *• published literature* *• databases* 2. The data below are the scores of 21 learners in a creative arts test. Organise it into a	

frequency distribution table by grouping them 59, 65, 61, 62, 53, 55, 60, 70, 64, 56, 58, 58, 62, 62, 68, 65, 56, 59, 68, 61, 67.

Lesson Closure

In completing this part, refer to the Essential Questions to check that learning has taken place.

Activity (e.g., 10 minutes)

(a) Recap the key concepts of data classification.

(b) Highlight the importance of proper data classification in making informed decisions in real – life.

Reflection & Remarks

(a) Reflect on whether the lesson objectives were met and identify any areas where learners might need additional support.
(b) Reflect on student participation and adjust group dynamics for more balanced involvement in future lessons.

Lesson 2

Main Lesson drawing on Concepts, Skills, and Competencies to reinforce as in the Subject Teacher Manual

Teacher Activity	*Learner Activity*
Starter ***Activity (e.g., 10 minutes)*** ***Teacher Activity:*** *Present a problem scenario where a company needs to collect data on customer satisfaction and product quality. Ask students how they would go about collecting this data.* ***Learner Activity:*** *Learners brainstorm in groups, propose data collection methods, and present their ideas to the class.*	
Introductory activity (e.g., 15 minutes) *In mixed ability and gender groupings, display images or objects representing different types of data collection scenarios (e.g., surveys, interviews, experiments) and ask learners to categorize each scenario as quantitative or qualitative data collection.* ***Activity 1 (e.g., 25 minutes)*** ❖ *Use PowerPoint Presentation or whiteboard illustration, introduce learners to the basic concepts of quantitative and qualitative data collection methods.* ❖ *Using talk for learning, present the detailed explanation of data collection methods for both*	***Introductory activity*** *Learners work in their respective groups to categorize the scenarios and justify their choices.* ***Activity 1*** • *Learners follow along with the presentation or illustration and take key notes.* • *Learners pay attention and take key notes on the explanation of data collection methods for both quantitative and qualitative data.*

quantitative data (such as surveys, experiments, tests and assessments, observational studies, and sensor data collection) and qualitative data (such as interviews, focus groups, observations, and document analysis). ***Activity 2 (e.g., 35 minutes)*** ❖ *Using talk for learning, highlight the differences between quantitative and qualitative data collection methods and identify when each method is most effective.* ❖ *Guide learners through hands – on activities where they practice designing their own surveys or interview questions based on given topics.* ❖ *In mixed ability and gender groupings, present case studies and assign learners to come out with which data collection method was used for the exercise.* ***Hint:*** *Circulate among the groups to supervise work, offer help, and correct misconceptions.* ***Activity 3 (e.g., 25 minutes)*** ❖ *Using talk for learning, explain the importance of validating data collection methods, discuss factors like reliability, validity, and accuracy and demonstrate how to validate methods using case studies.* ❖ *In mixed ability and gender groupings, present case studies to learners and task them to identify the methods used and discuss their validity.*	***Activity 2*** • *Learners pay attention and take key notes of the differences between the data collection methods.* • *Learners design either a survey or an interview guide based on their chosen topic.* • *Learners in their respective groups, present their findings to the class.* ***Activity 3*** • *Learners take notes and ask questions for clarification.* • *Groups present their findings from the data validation process, and discuss any challenges encountered.*

Hint: *Circulate among the groups to supervise work, offer help, and correct misconceptions.*	

Assessment DoK aligned to the Curriculum and Subject Teacher Manual

Assessment Level 3:

1. *i. Select an existing interview guide and discuss its features.*
   ii. Validate the guide and collect a qualitative data with it.

2. *i. Select an existing survey questionnaire and discuss its features.*
   ii. Validate the questionnaire and collect a quantitative data with it.

Lesson Closure

In completing this part, refer to the Essential Questions to check that learning has taken place.

Activity (e.g., 10 minutes)

(a) Summarize the key points discussed in the lesson, emphasizing the importance of choosing the right data collection methods and validating them.

(b) Encourage learners to think about how these concepts apply to their daily lives and future studies.

Reflection & Remarks

(a) Reflect on learner engagement levels during activities.
(b) Note any areas where learners struggled with concepts or applications that may need revisiting in future lessons.