Grade 10 Mathematics Lesson Plan

Frequency Distribution Tables

Strand:	**Statistics and Probability**
Sub-Strand:	Ungrouped Data
Specific Learning Outcome:	Draw a frequency distribution table for grouped and ungrouped data
Duration:	40 minutes
Key Inquiry Questions:	What is statistics? How do we represent data? How do we use statistics in day to day life?
Learning Resources:	CBC Grade 10 textbooks, chart paper, markers, calculators

Phase 1: Problem-Solving and Discovery (15 minutes)

Anchor Activity: Weekly Pocket Money Analysis

Objective: Students work in groups to construct an ungrouped frequency distribution table from raw data, identify patterns, and discuss findings.

Work in groups to complete the following tasks:

Scenario: The school administration wants to understand how much pocket money learners receive each week in order to plan a budgeting workshop.

Given Data: The weekly pocket expenses (in Ksh) of 25 randomly selected students are:

120, 150, 180, 200, 220, 250, 270, 290, 300, 320, 350, 370, 390, 400, 420, 450, 470, 480, 490, 500, 340, 230, 280, 410, 330

Task 1: Construct an ungrouped frequency distribution table showing each amount and its frequency.

Hint: Create a table with three columns: Amount (Ksh), Tally, Frequency

Task 2: Identify the highest and lowest pocket money received.

Think about: What is the range of pocket money amounts?

Task 3: Discuss your work with your fellow learners.

Consider: What patterns do you notice? Are most amounts similar or very different?

Discussion prompts for teachers:

- How did you organize the data? What method did you use?
- Did you use tally marks? How did they help?
- What is the highest pocket money amount? The lowest?
- How many different amounts are there?
- What does the frequency tell us about each amount?
- Why is it helpful to organize data this way instead of just looking at the list?

Phase 2: Structured Instruction (10 minutes)

Key Takeaways

1. What is a Frequency Distribution Table?

Definition: A frequency distribution table is a table that shows an event and how many times it happens.

2. Ungrouped Frequency Distribution

Characteristics:

- Lists each individual value and how many times it occurs
- Best for small datasets with few unique values
- Example: student test scores: 75 appears 3 times, 80 appears 5 times

3. Structure of Frequency Distribution Table

Three columns:

- Column 1: Value/Score/Amount - the individual data values
- Column 2: Tally - visual representation using tally marks
- Column 3: Frequency - the count of how many times each value appears

4. Using Tally Marks

Purpose: Tally marks help visually count occurrences before recording the frequency.

- Method: Make one mark (/) for each occurrence. Group marks in fives (/////) for easy counting.

5. Steps to Create a Frequency Distribution Table

1. 1. List all unique values in the first column in ascending order
2. 2. Go through the data and make tally marks for each value
3. 3. Count the tally marks and write the frequency in the third column
4. 4. Check: Sum of all frequencies should equal total number of data points

Phase 3: Practice and Application (15 minutes)

Worked Example 3.1.12

Problem: The following data represents test scores of 20 students in a grade 10 class:

45, 50, 55, 50, 60, 70, 75, 80, 70, 55, 60, 65, 50, 55, 45, 60, 75, 80, 70, 50

Prepare an ungrouped frequency distribution table for the dataset.

Solution:

Step 1: Identify unique values: 45, 50, 55, 60, 65, 70, 75, 80

Step 2: Count occurrences using tally marks

Step 3: Record frequencies

Frequency Distribution Table:

Score	Tally	Frequency
45	//	2
50	////	4
55	///	3
60	////	4
65	/	1
70	///	3
75	//	2
80	//	2

Total: 20 students

Worked Example 3.1.14

Problem: The marks scored by 20 students in a mathematics test are:

12, 15, 17, 15, 19, 21, 23, 17, 19, 25, 21, 23, 19, 17, 15, 23, 25, 21, 19, 23

Prepare an ungrouped frequency distribution table for the data.

Solution:

Mark	Tally	Frequency
12	/	1
15	///	3
17	///	3
19	/////	5
21	///	3
23	/////	5
25	//	2

Total: 20 students

Observation: Marks 19 and 23 appear most frequently (5 times each)

Phase 4: Assessment (5 minutes)

Exit Ticket

1. Twenty five students in Grade 10 recorded their travel time to school in minutes as follows:

15, 8, 22, 40, 12, 25, 8, 20, 15, 20, 15, 8, 15, 40, 12, 22, 12, 20, 8, 19, 20, 14, 12, 8, 22

a) Construct an ungrouped frequency distribution table for the data.

2. The costs (in Ksh.) of manufacturing equipment were recorded as follows:

1250, 1425, 3870, 1250, 4175, 2100, 1425, 2370, 1250, 4195, 1250, 3870, 4175, 4195, 1250, 2100, 3525, 2100, 4175, 3870, 2100, 1250, 4195, 2100, 1425

a) Construct an ungrouped frequency distribution table for the data.

3. The annual rainfall (in mm) recorded in a region was as follows:

625, 645, 780, 645, 720, 745, 780, 1000, 645, 835, 780, 880, 1000, 1050, 1000, 1050, 975, 1000, 625, 1050, 745, 720, 880, 780, 625

a) Construct an ungrouped frequency distribution table for the data.

Differentiation Strategies

For Struggling Learners:

- Provide pre-drawn table templates with column headings.
- Give smaller datasets (10-15 values) to start with.
- Demonstrate tally mark grouping (groups of 5) explicitly.
- Use color coding: one color for unique values, another for counting.
- Provide step-by-step checklist for creating tables.
- Allow use of calculators or counters to track frequencies.
- Work with peer tutors who can guide the process.

For Advanced Students:

- Work with larger datasets (30-40 values).
- Create frequency tables and then calculate additional statistics (range, most common value).
- Compare two different datasets using frequency tables.
- Identify when ungrouped vs grouped frequency tables are more appropriate.
- Design their own data collection project and create frequency tables.
- Analyze patterns and make predictions based on frequency distributions.

Extension Activity: Class Survey Data Analysis

Scenario: Conduct a survey in your class to collect data about student preferences or behaviors.

Tasks:

5. Choose a survey topic (e.g., favorite subject, hours of study per day, number of siblings, favorite sport).
6. Collect data from at least 20 classmates.
7. Construct an ungrouped frequency distribution table for your data.
8. Identify the most common response (highest frequency).
9. Identify the least common response (lowest frequency).
10. Calculate the total number of responses and verify it matches your data count.
11. Present your findings to the class, explaining what the frequency table reveals about your classmates.
12. Discuss: When would an ungrouped frequency table NOT be suitable for your data?