Grade 10 Mathematics Lesson Plan

Mode (Grouped)

Strand:	**Statistics and Probability**
Sub-Strand:	Grouped Data
Specific Learning Outcome:	Determine mean, mode and median of 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, highlighters

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

Anchor Activity 3.1.10: Pocket Money Modal Class

Objective: Students work in groups to discover the concept of modal class by identifying the interval with the highest frequency.

Work in groups to analyze the following scenario:

Using the pocket money data provided below:

Pocket Money (Ksh)	Frequency
100 – 199	8
200 – 299	15
300 – 399	22
400 – 499	20
500 – 599	10

Tasks:

1. Which group has the highest number of students?

2. What is the modal class of pocket money given to students?

Discussion prompts for teachers:

- Look at the Frequency column. Which number is the largest?
- Which interval (pocket money range) has that highest frequency?
- What does this tell us about pocket money in this group?
- Can we say a specific amount is the mode? Why or why not?

Phase 2: Structured Instruction (10 minutes)

Key Takeaway 3.1.60: Modal Class

For grouped data, the Modal Class is simply the class interval with the highest frequency. It represents the range where the majority or the highest density of the data points lie.

Important Characteristics

- No calculation needed - just identify the highest frequency
- Modal class is an interval, not a single number
- Represents the most common range of values
- Can have multiple modal classes if two or more intervals have the same highest frequency (bimodal, multimodal)
- Can have no modal class if all frequencies are equal

Step-by-Step Process

1. Step 1: Read the frequency column carefully
2. Step 2: Identify the highest frequency (largest number)
3. Step 3: Find the corresponding interval for that frequency
4. Step 4: State the modal class as the interval (not just a number)
5. Step 5: Interpret the result - what does this tell us about the data?

Difference from Ungrouped Mode

- Ungrouped mode: Specific value that appears most often (e.g., "5 appears 8 times")
- Grouped mode: Interval with highest frequency (e.g., "300–399 has 22 students")

Phase 3: Practice and Application (15 minutes)

Worked Example 3.1.61 (Employee Salaries)

Problem: A company records the monthly salaries (in KES) of employees. Identify the modal class from the table below.

Salary Range (KES)	Number of Employees
20,000 - 29,999	3
30,000 - 39,999	5
40,000 - 49,999	7
50,000 - 59,999	10
60,000 - 69,999	9
70,000 - 79,999	6
80,000 - 89,999	5

Solution:

To find the modal class, we look for the highest frequency in the "Number of Employees" column.

Frequencies: 3, 5, 7, 10, 9, 6, 5

The highest frequency is 10. This corresponds to the salary range 50,000–59,999.

Therefore, the Modal Class is 50,000–59,999 KES.

Interpretation: Most employees in the company earn between 50,000 and 59,999 KES per month.

Phase 4: Assessment (5 minutes)

Exit Ticket

1. A Bata shop in Mombasa recorded the sizes of shoes sold during a "Back to School" sale.

Shoe Size	Pairs Sold
2 - 4	15
5 - 7	45
8 - 10	30
11 - 13	10

Identify the modal class of the shoe sizes.

2. The meteorological department recorded the daily rainfall (in mm) in Nyeri for the month of April.

Rainfall (mm)	No. of Days
0 - 4	10
5 - 9	4
10 - 14	12
15 - 19	3
20 - 24	1

State the modal class for the rainfall.

Differentiation Strategies

For Struggling Learners:

- Provide highlighters to mark the highest frequency in the table.

- Use color coding: highlight frequency column in one color, modal class in another.
- Start with smaller tables (3-4 intervals) to build confidence.
- Create visual charts or bar graphs to make the modal class obvious.
- Provide sentence frames: "The highest frequency is _____. This corresponds to the interval _____."
- Work in pairs with peer support.
- Use concrete examples students understand (favorite foods, shoe sizes, ages).

For Advanced Students:

- Explore bimodal and multimodal distributions - what causes them?
- Compare modal class with mean and median for the same dataset - when do they differ?
- Investigate datasets where modal class is NOT the best measure of central tendency.
- Create their own grouped frequency tables from raw data and find modal class.
- Research real-world applications: business inventory decisions, urban planning, healthcare.
- Draw histograms to visualize modal class and discuss distribution shapes.
- Analyze what happens to modal class when class widths change.

Extension Activity: Modal Class for Business Decisions

Scenario: You are the manager of a shoe shop planning inventory for the next school term.

Use the shoe size data from Exit Ticket Question 1:

Shoe Size	Pairs Sold
2 - 4	15
5 - 7	45
8 - 10	30
11 - 13	10

Tasks:

1. Identify the modal class. What does this tell you about customer demand?

2. If you can only stock 100 pairs of shoes, how would you distribute them across size ranges? Explain your reasoning.

3. The supplier offers a discount if you order at least 50 pairs of one size range. Which range would you choose? Why?

4. Compare your decision using modal class vs using mean. Which is more useful for this business decision?

5. What other factors (besides modal class) should you consider when stocking inventory?

Expected Findings:

- Modal class is 5-7 (45 pairs sold) - highest demand is for children/youth sizes.
- Stock distribution might be: 5-7 (50 pairs), 8-10 (30 pairs), 2-4 (15 pairs), 11-13 (5 pairs).
- Order 50+ pairs of size 5-7 to get discount, since it has highest demand.
- Modal class is more useful than mean for inventory - you stock actual size ranges, not average sizes.
- Other factors: seasonal trends, price points, storage space, supplier reliability, customer demographics.