CBC Grade 10 Mathematics Lesson Plan

Lesson Topic: Statistics in Real-Life

Strand: Statistics and Probability

Sub-Strand: Statistics in Real-Life

Duration: 40 minutes (1 lesson)

Class: Grade 10

Specific Learning Outcome

By the end of the lesson, learners should be able to:

- Collect data from real-life sources
- Promote data collection, organisation and representation for informed decision making

Key Inquiry Questions

1. What is statistics?
2. How do we represent data?
3. How do we use statistics in day-to-day life?

Learning Resources

- CBC Grade 10 Mathematics textbook
- Pens, pencils, erasers
- Rulers
- Exercise books
- Graph paper
- Chart paper for group presentations
- Calculators

Lesson Structure (40 Minutes)

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

Anchor Activity: School Lunch Preferences Survey

Students work in groups to:

1. Collect data from 30 students asking: "Which of the following school lunch options do you prefer?"

- Option A: Rice and beans
- Option B: Githeri
- Option C: Chapati and beans
- Option D: Ugali and vegetables

2. Record responses (e.g., A, D, C, C, B, A, D, A, B, C, A, D, A,...)

3. Prepare an ungrouped frequency table with columns: Options, Tally, Frequency

4. Draw a histogram and frequency polygon for the lunch preferences

5. Interpret the data to determine:

i) Which lunch option is the most preferred?

ii) Which lunch option is the least preferred?

iii) If the school wanted to serve the most preferred meal next week, which meal should they choose?

6. Discuss: Why is it important to collect data from many students rather than just a few?

7. Reflect: How did organizing and representing the data help you in interpreting the results and making a decision?

Teacher Role:

• Circulate among groups, asking guiding questions

• Observe how students organize and represent data

• Note common approaches and misconceptions

• Select 2-3 groups to share their findings

Phase 2: Structured Instruction (10 minutes)

Key Concept: Informed Decision-Making

Definition:

Informed decision-making is the process of using data and evidence to make choices that are based on facts and analysis rather than assumptions or guesses.

Six-Step Process for Making Informed Decisions Based on Data:

1. Identify the problem or question to be addressed

   Example: Which lunch option should the school serve?

2. Collect relevant data through surveys, experiments, or observations

   Example: Survey 30 students about lunch preferences

3. Organize the data into useful forms such as frequency tables (both grouped and ungrouped)

   Example: Create frequency table with tally marks

4. Represent the data visually using tables, histograms, and frequency polygons to identify patterns, trends, and relationships

Example: Draw histogram showing lunch preferences

5. Interpret the data to draw conclusions

Example: Rice and beans is most preferred (highest frequency)

6. Make informed decisions based on the analysis and interpretation of the data

Example: School should serve rice and beans next week

Connection to Student Discoveries:

• Link the anchor activity to each step of the process

• Emphasize that they already practiced informed decision-making

• Highlight real-world applications: business decisions, government policy, personal choices

Phase 3: Practice and Application (15 minutes)

Worked Example: School Activities Preferences

Problem:

A class of 60 students was asked which type of school activity they preferred. The responses were recorded:

Activity	Frequency
Football	12
Debate club	10
Basketball	8
Drama	5
Music band	10
Math club	15

Questions:

1. Which method could be used to collect the data?

2. Represent the organized data using a histogram.

3. Identify the most preferred activity.

4. If the school can support only one activity next term, which activity should they choose? Why?

Solution:

1. The data could have been collected using a survey where students were asked to choose their preferred activity from a list of options.

2. [Students draw histogram with activities on x-axis and frequency on y-axis]

3. The most preferred activity is the Math club, with a frequency of 15 students.

4. The school should choose to support the Math club because it is the most preferred activity among the students, as indicated by the highest frequency in the data.

Phase 4: Assessment (5 minutes)

Exit Ticket:

Question 1:

The number of students who visited the school library over 10 days is shown below:

20, 25, 30, 35, 25, 40, 30, 20, 25, 35

(a) Construct a frequency table.

(b) Calculate the mean number of students.

(c) State the mode.

(d) Should the school increase the number of library seats from 25 to 40? Give a reason.

Question 2:

The marks obtained by 30 students in a Mathematics test are grouped below:

Marks	Frequency
0-20	3
20-40	5
40-60	10
60-80	8
80-100	4

(a) Estimate the mean mark.

(b) Draw a histogram.

(c) Comment on the general performance.

Question 3:

A dairy shop recorded daily milk sales (litres) for 7 days:

80, 90, 100, 120, 110, 95, 105

(a) Find the mean.

(b) Find the median.

(c) Should the shop stock 85 litres daily? Give a reason.

Differentiation Strategies

For Struggling Learners:

• Provide pre-made frequency table templates

• Use smaller datasets (15-20 data points instead of 30)

• Pair with stronger students for peer support

• Provide step-by-step checklist for the six-step process

• Use visual aids showing examples of each step

For Advanced Learners:

• Challenge them to collect data from multiple classes (60+ students)

• Ask them to compare results from different groups (boys vs girls, different grades)

• Have them create grouped frequency tables in addition to ungrouped

• Encourage them to calculate mean, median, and mode for their data

• Ask them to identify potential biases in their data collection

Extension Activity

School Improvement Data Project

Task:

Students work in groups to identify a school issue and use statistics to make recommendations.

Steps:

1. Identify a school issue (e.g., library usage, canteen menu, extracurricular activities, study time, break time activities)

2. Design a survey or data collection method

- Write clear questions
- Decide on sample size (at least 40 students)
- Plan how to collect data fairly

3. Collect data from students across different classes

4. Organize data using frequency tables (ungrouped and/or grouped)

5. Represent data using:

- Histogram
- Frequency polygon
- Calculate mean, median, mode as appropriate

6. Interpret the data:

- What patterns do you see?
- What does the data tell us about student preferences or behaviors?
- Are there any surprising findings?

7. Make recommendations:

- Based on the data, what should the school do?
- Support recommendations with specific evidence from the data
- Consider practical constraints (budget, space, time)

8. Present findings:

- Create a poster or presentation
- Include graphs, tables, and written analysis
- Present to class or school administration

Assessment Criteria:

- Quality of data collection (appropriate method, sufficient sample size)

• Accuracy of organization and representation

• Depth of interpretation

• Practicality and evidence-based nature of recommendations

• Clarity of presentation

Teaching Tips

• Make it real: Use examples from students' daily lives and local contexts

• Emphasize the process: Focus on the six steps, not just calculations

• Encourage critical thinking: Always ask "What does this data tell us?" and "What should we do?"

• Use authentic data: Collect real data from the class or school

• Connect across topics: This lesson integrates all previous statistics topics

• Emphasize practical application: Statistics is a tool for solving real problems

• Allow collaboration: Group work mirrors real-world data projects

• Celebrate diversity of approaches: Different groups may organize data differently

Common Student Misconceptions to Address

1. "Statistics is just about numbers"

→ Statistics is about using numbers to make informed decisions and solve real problems

2. "The mean is always the best measure"

→ Sometimes median or mode is more appropriate, depending on the situation

3. "More data is always better"

→ Quality matters more than quantity; relevant, accurate data is better than lots of irrelevant data

4. "You can make any decision you want from data"

→ Data should guide decisions, not just support pre-made choices