Step-by-Step Presentation Script

Statistics in Real-Life

CBC Grade 10 Mathematics • 40 Minutes

Pre-Class Preparation

Materials Needed:

□ CBC Grade 10 Mathematics textbook

□ Chart paper for each group (6-8 groups)

□ Graph paper for each student

□ Rulers, pens, pencils, erasers

□ Calculators

□ Markers for group work

□ Board markers and eraser

□ Printed worked example (optional)

Setup:

□ Arrange students into groups of 4-5

□ Prepare anchor activity instructions on board or handout

□ Have frequency table template ready (optional support)

□ Prepare worked example on board or chart

Detailed Lesson Script

Minutes 0-2: Introduction and Hook

[SAY] "Good morning, class! Today we're going to learn how statistics helps us make smart decisions in real life. Let me ask you: How does the school canteen decide which foods to sell?

How does a shop owner know which products to stock? The answer is: they use data and statistics!"

[DO] Write on board: "Statistics in Real-Life: Making Informed Decisions"

[ASK] "Can anyone give me an example of a decision you or your family makes using information or data?"

[LISTEN] Accept 2-3 responses (e.g., choosing a phone plan, deciding what to cook, planning a budget)

[SAY] "Excellent! Today you'll collect real data, organize it, and use it to make a recommendation to the school. You'll be real statisticians!"

Minutes 2-17: Anchor Activity - School Lunch Preferences

[DO] Display or read anchor activity instructions

[SAY] "You're going to work in groups to find out which school lunch option students prefer most. Here's what you'll do:"

[WRITE] On board:

1. Survey 30 students: "Which lunch do you prefer?"

   A: Rice and beans

   B: Githeri

   C: Chapati and beans

   D: Ugali and vegetables

2. Record responses (A, D, C, C, B, A, D, A...)
3. Make frequency table with tally marks

4. Draw histogram and frequency polygon

5. Answer: Which is most/least preferred? What should school serve?

6. Discuss: Why survey 30 students, not just 5?

7. Share your findings

[SAY] "You have 12 minutes. Divide tasks in your group: some collect data, some organize, some draw graphs. Go!"

[DO] Start timer. Circulate among groups.

Guiding Questions While Circulating:

• "How are you recording the responses?"

• "What does your frequency table show so far?"

• "Which lunch option is leading?"

• "How did you decide which students to survey?"

• "What would happen if you only surveyed 5 students instead of 30?"

Watch for:

• Groups struggling with tally marks → remind them to group in fives

• Incomplete frequency tables → check they have all four options

• Histogram errors → remind them bars should touch for continuous data (though this is categorical, so gaps are okay)

[SAY] At 12 minutes: "Time's up! Finish your current step. I'd like 2-3 groups to share."

[DO] Select 2-3 groups with different findings or approaches

[ASK] Each group:

• "What was the most preferred lunch option in your survey?"

• "What was the least preferred?"

• "Based on your data, what should the school serve next week?"

• "Why is it important to survey many students?"

[LISTEN] Accept responses. Highlight key points:

• Larger samples give more reliable results

• Organizing data in tables makes patterns clear

• Graphs help us see which option is most popular

• Data helps us make decisions based on facts, not guesses

Minutes 17-27: Structured Instruction

[SAY] "Excellent work! You just practiced something very important called informed decision-making. Let me explain what that means."

[WRITE] On board: "Informed Decision-Making = Using data and evidence to make choices based on facts, not guesses"

[SAY] "There are six steps to making informed decisions using data. Let's see how your lunch survey followed these steps."

[WRITE] On board (with examples from anchor activity):

Step 1: Identify the problem or question

Example: Which lunch should the school serve?

[ASK] "What was our question in the anchor activity?"

[LISTEN] "Which lunch option do students prefer?"

Step 2: Collect relevant data

Example: Survey 30 students about lunch preferences

[ASK] "How did you collect data?"

[LISTEN] "We surveyed students"

Step 3: Organize the data

Example: Create frequency table with tally marks

[ASK] "How did you organize your data?"

[LISTEN] "We made a frequency table"

Step 4: Represent the data visually

Example: Draw histogram and frequency polygon

[ASK] "What graphs did you create?"

[LISTEN] "Histogram and frequency polygon"

Step 5: Interpret the data

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

[ASK] "What did your data tell you?"

[LISTEN] Various responses about most/least preferred options

Step 6: Make informed decisions

Example: School should serve rice and beans next week

[ASK] "What recommendation did you make to the school?"

[LISTEN] Recommendations based on data

[SAY] "See? You already know how to make informed decisions! This process is used everywhere: businesses deciding what to sell, government planning services, doctors choosing treatments, even you deciding how to spend your time."

[EXAMPLE] "For instance, if a shop owner wants to know which products to stock, they follow these same six steps: identify the question (what should I stock?), collect sales data, organize it in tables, create graphs, interpret patterns, and decide which products to order more of."

Minutes 27-37: Worked Example - School Activities

[SAY] "Now let's practice with another example. Imagine the school wants to support one extracurricular activity but needs to decide which one."

[WRITE] On board:

Problem: A class of 60 students was asked which school activity they preferred.

[DO] Draw table on board:

Activity	Frequency
Football	12
Debate club	10
Basketball	8
Drama	5

Music band	10
Math club	15

[SAY] "Let's answer four questions about this data."

Question 1: Which method could be used to collect this data?

[ASK] "Turn to your partner: How do you think they collected this data?"

[LISTEN] Accept responses

[SAY] "Correct! They used a survey where students chose from a list of activities."

Question 2: Represent the data using a histogram

[DO] Draw histogram on board with students' help:

• X-axis: Activities (Football, Debate, Basketball, Drama, Music, Math)

• Y-axis: Frequency (0 to 16)

• Draw bars for each activity

[SAY] "Notice the bars can have gaps because these are categories, not continuous numbers."

Question 3: Identify the most preferred activity

[ASK] "Which activity has the highest frequency?"

[LISTEN] "Math club with 15 students"

[SAY] "Correct! The Math club is the most preferred activity."

Question 4: If the school can support only one activity, which should they choose? Why?

[ASK] "Based on the data, which activity should the school support?"

[LISTEN] Accept responses

[SAY] "The school should support the Math club because it is the most preferred activity, with the highest frequency of 15 students. This is an informed decision based on data, not just a guess."

[SAY] "This is exactly how schools, businesses, and organizations make decisions in real life. They collect data, analyze it, and make choices based on evidence."

Minutes 37-40: Exit Ticket and Closure

[SAY] "For your exit ticket, you'll answer three quick questions to show you understand how to use statistics in real life."

[DO] Write exit ticket questions on board or distribute handouts

Exit Ticket Questions:

1. Library visits over 10 days: 20, 25, 30, 35, 25, 40, 30, 20, 25, 35

   (a) Construct frequency table

   (b) Calculate mean

   (c) State mode

   (d) Should school increase library seats from 25 to 40? Why?

2. Test marks (grouped data):

   0-20: 3, 20-40: 5, 40-60: 10, 60-80: 8, 80-100: 4

   (a) Estimate mean

   (b) Draw histogram

(c) Comment on performance

3. Milk sales (litres) for 7 days: 80, 90, 100, 120, 110, 95, 105

(a) Find mean

(b) Find median

(c) Should shop stock 85 litres daily? Why?

[SAY] "You have 3 minutes. Work individually."

[DO] Circulate, observe student work

[SAY] At 3 minutes: "Time! Let's quickly review."

[ASK] "For question 1d, should the school increase library seats to 40?"

[LISTEN] "No, because the mode is 25 and mean is 28.5, so 30 seats would be enough"

[ASK] "For question 3c, should the shop stock 85 litres?"

[LISTEN] "No, because the mean is 100 litres, so stocking 85 would cause shortages"

[SAY] "Excellent! You're using data to make informed decisions. This is exactly what statisticians, business owners, and decision-makers do every day."

[SAY] "For homework, think about a decision you or your family needs to make. How could you collect data to help make that decision? Write a short paragraph explaining your plan using the six steps we learned today."

[DO] Collect exit tickets as students leave

Teaching Tips

1. Make it real:

- Use examples from students' daily lives (school lunch, activities, library)
- Connect to Kenyan contexts (githeri, ugali, local businesses)
- Invite students to suggest problems to investigate

2. Emphasize the process:

- Don't just focus on calculations
- Highlight the six-step decision-making process
- Show how each step builds toward a conclusion

3. Encourage critical thinking:

- Always ask "What does this data tell us?"
- "What decisions can we make?"
- "What other information might we need?"
- "Are there any limitations to our conclusions?"

4. Use authentic data:

- Collect real data from the class
- Use data from school records (with permission)
- Find data from newspapers, government reports

5. Connect across topics:

- This lesson integrates all previous statistics topics
- Frequency tables (ungrouped and grouped)

- Histograms and frequency polygons
- Mean, median, mode
- Data interpretation

6. Emphasize practical application:

- Always end with "What should we do based on this data?"
- Help students see statistics as a tool, not just a subject
- Encourage them to use statistics in their own lives

Common Student Errors to Watch For

1. Collecting insufficient data:

→ Remind students that larger samples give more reliable results

2. Not organizing data before analyzing:

→ Emphasize the importance of frequency tables

3. Confusing frequency with the data value:

→ Clarify that frequency is how many times something occurs

4. Making decisions without data support:

→ Always ask "What evidence do you have from the data?"

5. Thinking statistics can prove anything:

→ Explain that statistics provides evidence, but interpretation requires careful thinking

6. Not considering practical constraints:

→ Remind students that decisions must be realistic (budget, space, time)

Post-Lesson Reflection Questions

For the teacher to consider after the lesson:

□ Did students successfully collect and organize data in groups?

□ Could students explain the six-step process for informed decision-making?

□ Did students make evidence-based recommendations?

□ Were students able to connect statistics to real-life situations?

□ What misconceptions emerged that need to be addressed?

□ Which students need additional support with data collection or interpretation?

□ Which students are ready for extension activities?

□ How can I incorporate more real-world data in future lessons?