Grade 10 Mathematics Lesson Plan

Sources of Data

Strand:	**Statistics and Probability**
Sub-Strand:	Introduction to Statistics
Specific Learning Outcome:	Collect data from real-life sources, and promote data collection, organisation and representation for informed decision making
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, sample research scenarios

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

Anchor Activity: Research on Social Media Effects

Objective: Students work in groups to identify appropriate data collection methods and distinguish between primary and secondary data sources in a real-world research context.

Work in groups to complete the following tasks:

Scenario: A teacher assigned students a research topic on the effects of social media on teenage mental health in Kenya.

Task 1: Suggest one potential primary data collection method that could be used.

Examples to consider: surveys, interviews, observations, experiments

Task 2: Suggest one potential secondary data source that could be used.

Examples to consider: government reports, research articles, published studies

Task 3: What is the difference between primary and secondary data?

Think about: Who collects the data? When is it collected? What is its purpose?

Task 4: Why is secondary data important for research and decision-making?

Consider: cost, time, availability, reliability

Task 5: Discuss and share with other groups.

Discussion prompts for teachers:

- What primary data collection method did your group suggest? Why?
- What secondary data sources would be helpful for this research?
- How would you explain the difference between primary and secondary data?
- What are the advantages of using secondary data?
- When would it be better to collect primary data instead of using secondary data?

Phase 2: Structured Instruction (10 minutes)

Key Takeaways

1. What is Data?

Definition: Data is a collection of facts, figures, numbers, observations, measurements, or descriptions that can be recorded, stored, and used to study or understand something.

2. Three Categories of Data Sources

Primary Data Sources:

- Original first-hand data collected directly for a specific purpose
- Collected by the researcher or investigator specifically for the current study
- Examples: surveys, interviews, observations, experiments

Secondary Data Sources:

- Previously collected data used for a different purpose
- Information already collected by someone else
- Examples: government reports, research articles, published studies, historical records

Tertiary Data Sources:

- Summarize and compile information from primary and secondary sources
- Examples: dictionaries, textbooks, encyclopedias

3. Primary Data Collection Methods

- Surveys/Questionnaires: Set of questions to gather information from a group (in person, phone, online)
- Interviews: Conversation between interviewer and respondent for detailed information
- Observations: Watching and recording behaviors or events in natural settings
- Experiments: Manipulating one variable to determine its effect on another

4. Advantages of Secondary Data

- Cost-effective: Data already exists, no need to spend money collecting it
- Time-saving: Faster than conducting new research
- Access to large datasets: Can analyze data from entire populations

- Historical perspective: Can study trends over time
- Reliable: Often from established, credible sources

Phase 3: Practice and Application (15 minutes)

Worked Example from Textbook (Example 3.1.2)

Classify the following as primary or secondary data sources:

1. A student conducts a survey to find out the favorite sports of their classmates.

2. A teacher uses last year's national exam results to analyze student performance trends.

3. A researcher reads a government report on the most common diseases in Kenya.

4. A doctor observes a patient's symptoms and records them for a medical study.

5. A scientist conducts an experiment to test the growth rate of plants under different conditions.

Solution:

- 1. Primary - The student is collecting first-hand data directly from people.
- 2. Secondary - The exam results were already collected and recorded by an external body.
- 3. Secondary - The report was collected and published by someone else for a different purpose.
- 4. Primary - The doctor is directly collecting new data from real-life observation.
- 5. Primary - The scientist is generating new data through an experiment.

Phase 4: Assessment (5 minutes)

Exit Ticket

1. Grade 10 students from Korinyang Primary School went to Lake Nakuru National Park and counted the flamingos they saw for their Biology project.

a) Is this a primary or secondary data source?

b) Give reason.

2. In a market, a shop owner watches what customers buy most often and looks for trends based on what they see in the store.

Which sources of data can the shop owner use to collect the data?

3. Define the following terms:

a) Data Source

b) Raw Data

c) Tertiary Sources

d) Primary sources

4. What are the advantages of using secondary data over primary data in some research situations?

Differentiation Strategies

For Struggling Learners:

- Provide visual charts comparing primary vs secondary data with clear examples.
- Give sentence starters for discussions: "Primary data is...", "Secondary data is..."
- Use color coding: green for primary data, blue for secondary data.
- Provide a list of data collection methods with definitions.
- Work with peer tutors during classification activities.
- Use real-life scenarios familiar to students (school, home, community).
- Create flashcards with examples for sorting practice.

For Advanced Students:

- Design a complete research proposal including both primary and secondary data sources.
- Evaluate the reliability and validity of different data sources.
- Compare advantages and disadvantages of different data collection methods.
- Analyze ethical considerations in data collection (consent, privacy, confidentiality).
- Research and present on how data is used in specific careers (medicine, business, government).
- Create a data collection plan for a school improvement project.

Extension Activity: Community Youth Needs Assessment

Scenario: A community group wants to understand the needs of youth in their area.

Tasks:

1. What primary data collection methods could the group use? List at least three methods and explain why each would be useful.
2. What problems might they have when trying to find this information? Consider access, cost, time, and cooperation.
3. How can they use the information they find to help the community? Suggest specific actions or programs.

4. What secondary data sources could be useful to this community group? Name at least three sources.
5. Design a simple survey with 5 questions that the community group could use to collect primary data about youth needs.
6. Create a plan showing how the group would combine primary and secondary data to get a complete picture of youth needs.