

Grade 10 Mathematics Lesson Plan

Methods of Data Collection

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 questionnaires

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

Anchor Activity: Television Viewing Habits

Objective: Students work in groups to organize data, identify the data collection method used, and explore additional questions for research.

Work in groups to complete the following tasks:

Given Data: The following data represents the number of hours people spend watching television per week:

- 0-5 hours: 20 people
- 6-10 hours: 35 people
- 11-15 hours: 25 people
- 16-20 hours: 10 people

Task 1: Create a table to organize this data.

Use columns for: Hours Range, Number of People

Task 2: What type of data collection method was most likely used to gather this data?

Think about: How would someone find out how many hours people watch TV? Would they ask questions, observe, or use existing records?

Task 3: What are some other questions that could be asked to further explore this topic?

Consider: What else would you want to know about television viewing habits?

Task 4: Discuss and share with other groups.

Discussion prompts for teachers:

- What data collection method did your group identify? Why do you think so?
- What other questions could help us understand television viewing better?
- Could we use a different method to collect this data? What would be the advantages?
- How would you organize the data if you were presenting it to others?
- What patterns do you notice in the data?

Phase 2: Structured Instruction (10 minutes)

Key Takeaways

1. Overview

Methods of collecting data help us gather information. Choosing the right method depends on what you want to learn and the resources available.

2. Primary Data Collection Methods

Involve gathering new data directly from sources

1. Surveys/Questionnaires:

- Set of questions designed to gather information from a group of people
- Can be conducted in person, over the phone, or online
- Good for collecting data from many people quickly

2. Interviews:

- Conversation between an interviewer and a respondent
- Gather detailed information on a specific topic
- Allows for follow-up questions and clarification

3. Observations:

- Process of watching and recording behaviors or events
- Occurs in natural setting
- Useful for studying behavior as it happens

4. Experiments:

- Method of collecting data by manipulating one variable
- Determines effect on another variable
- Used in scientific research

3. Secondary Data Collection Methods

Existing Records (Secondary Data):

- Use of existing data collected by someone else for a different purpose
- Includes government reports, academic studies, historical records
- Cost-effective and time-saving

4. Choosing the Right Method

- What information do you need?
- How many people do you need to study?
- How much time and money do you have?
- Do you need detailed or general information?
- Is the data already available somewhere?

Phase 3: Practice and Application (15 minutes)

Worked Example 3.1.7

Problem: A student wants to find out the most popular extracurricular activities among their classmates.

- a) What data collection method would be most appropriate?
- b) What are two examples of specific questions they could ask?

Solution:

a) Survey/Questionnaire - This method allows collecting data from all classmates efficiently. It can be done quickly and provides structured responses.

- b) Sample questions:
 - What extracurricular activities do you participate in?
 - How often do you participate in these activities?

Worked Example 3.1.8

Problem: A local bakery conducted a study asking customers about their favorite types of pastries. The results are:

- Cakes: 45%
- Cookies: 30%
- Breads: 20%
- Doughnuts: 5%

- a) What type of data collection method was most likely used to gather this data?
- b) What is the most popular type of pastry among customers?
- c) What percentage of customers prefer either Cakes or Cookies?

d) What type of pastry is the least popular among customers?

Solution:

- a) A survey/questionnaire - The bakery asked customers directly about their preferences.
- b) Cakes (45%) - This has the highest percentage.
- c) $45\% + 30\% = 75\%$ - Add the percentages for Cakes and Cookies.
- d) Doughnuts (5%) - This has the lowest percentage.

Phase 4: Assessment (5 minutes)

Exit Ticket

1. Which data collection method would be most suitable for finding out the most common types of litter found in your school compound?

- a) Interviews
- b) Surveys sent to parents
- c) Observations
- d) Analyzing government reports

2. Describe one ethical consideration you should keep in mind when conducting interviews with community members.

3. Why is it important to keep accurate records when conducting observations?

4. Give one example of a situation where you would use secondary data collection in a Geography class.

Differentiation Strategies

For Struggling Learners:

- Provide templates for organizing data into tables.
- Give examples of each data collection method with clear scenarios.
- Use visual aids showing when to use each method.
- Provide sentence starters: "I would use surveys because..."
- Work with peer tutors during method selection activities.
- Create flashcards with method names and definitions.
- Use real-life examples familiar to students (school, home, community).

For Advanced Students:

- Design a complete research study including method selection and justification.
- Compare advantages and disadvantages of different methods for the same research question.
- Analyze ethical considerations for each data collection method.
- Create sample questionnaires or interview guides for specific research topics.
- Evaluate the reliability and validity of different methods.
- Research how professionals use data collection in specific careers (medicine, business, science).

Extension Activity: School Improvement Research Project

Scenario: Your school wants to improve student satisfaction and needs to collect data about student experiences.

Tasks:

1. Identify three different aspects of school life you could study (e.g., cafeteria food, library resources, sports facilities).
2. For each aspect, choose the most appropriate data collection method and explain why.
3. Design a simple questionnaire with 5 questions for one of your chosen aspects.
4. Explain what ethical considerations you would need to address.
5. Describe how you would organize and present the data you collect.
6. Compare using primary data collection versus secondary data (e.g., past student surveys) for your research.