9SP1.3 Develop and implement a project plan for the collection, display and analysis of data by:

- ***formulating a question for investigation***
- ***choosing a data collection method that includes social considerations***
- ***selecting a population or a sample***
- ***collecting the data***
- ***displaying the collected data in an appropriate manner***
- ***drawing conclusions to answer the question.***

Designing and Implementing a Project Plan and Rubric

A rubric is a system that can be designed to help evaluate the work completed on an investigation.

Example
Martin has four weeks to train for a half marathon. The following are some areas he has to focus on to perform at a level of excellence:

- Cardiovascular training: Running a maximum of 4 out of 7 days per week, a minimum of 6 km per day.
- Strength training: A maximum of 3 out of 7 days per week, a minimum of 2 hours per day.
- Balanced nutrition: 65% carbohydrates, 25% unsaturated fats, and 10% protein per meal.
- Adequate sleep: A maximum of 8 hours of sleep per night is most desirable.
- Proper vitamin supplements: 3 vitamin supplements taken daily is most desirable.

Create a rubric that Martin can use to assess his training on a weekly basis.

Solution
This is a potential rubric that Martin can use to assess his progress on a weekly basis.

Criteria	Level 1	Level 2	Level 3	Level 4
Cardio	Running 1 day a week	Running 2 days a week	Running 3 days a week	Running 4 days a week
Strength	Weight training 0 days a week	Weight training 1 days a week	Weight training 2 days a week	Weight training 3 days a week
Nutrition	80% Carbohydrates 10% Unsaturated fats 10% Proteins	70% Carbohydrates 15% Unsaturated fats 15% Proteins	70% Carbohydrates 25% Unsaturated fats 5% Proteins	65% Carbohydrates 25% Unsaturated fats 10% Proteins
Sleep	< 3 hours	< 5 hours	< 7 hours	8 hours
Vitamins	Took $\frac{0}{3}$	Took $\frac{1}{3}$	Took $\frac{2}{3}$	Took $\frac{3}{3}$

The **project plan** is a map used by the investigator for collection, analysis, and assessment of an investigation.

Follow these steps when designing and implementing a project plan:
1. Formulate a question for investigation that is free from any influence.
2. Select and identify a method of collecting data.
3. Select and identify a population or sample to be investigated.
4. Collect and record the data.
5. Display and analyze the data.
6. Design a rubric, and evaluate the investigation.

Example
Henry wants to investigate the most common types of part-time jobs that students in Grade 9 have in his school.

Design a project plan for this investigation, and identify any strengths and weaknesses of the project plan.
Solution
Step 1
Formulate a question for investigation that is free from any influence.

A possible question Henry can ask the students in Grade 9 is "Do you have a part-time job? If yes, what is your job title?"

Step 2
Select a method of collecting data.

In this investigation, the best method of collecting data would be to use a survey. A paper survey or email survey would be a cost-effective way to collect the data.

Step 3
Identify a population or sample to be surveyed.

In this case, depending on many students are in Grade 9, asking the entire population would be time-consuming. Therefore, he may want to use a random sample in which every student has an equal opportunity to answer the question.

Step 4
Collect and record the data.

When the surveys have been completed and returned to Henry, he will have to record the data on a tally chart or on a spreadsheet on a computer.

Step 5
Display and analyze the data.

He may want to use a circle graph to show the comparison of the different types of jobs the students do compared to the whole population.

Step 6
Design a rubric, and evaluate the investigation.

With the help of a rubric, he can identify the strengths and weaknesses of his investigation and make changes to ensure a successful investigation.

The following is a possible rubric that can be used to assess this investigation:

Rubric

Criteria	Level 1	Level 2	Level 3	Level 4
Planning: Formulating a question and choosing a method of data collection.	Question has one or more influencing factors. The method of data collection produces inaccurate data.	Question has one influencing factor. The method of data collection is too time-consuming.	Question has no influencing factor. The method of data collection produces adequate data.	Question is free from influence. The method of data collection produces accurate data.
Planning: Choosing a population or a sample.	Choice produces too much data to manage.	Choice is too time-consuming	Choice results in adequate data.	Choice results in accurate data.
Performing and Recording: Collecting data and recording finding	Methods result in inaccurate data.	Methods are adequate but could cause misinterpretation of data.	Methods result in adequate data.	Methods result in accurate data.
Recording: Displaying data in an appropriate manner.	Method leads to misinterpretation of data.	Method is confusing and could be misleading.	Method is adequate.	Method is easy to interpret.
Analyzing and Presenting: Analyzing data and drawing conclusions to answer the questions.	The data is misleading and does not answer the investigation question.	The data needs some clarification and is misleading.	The data collected is adequate and answers the investigation question.	The data collected is excellent and clearly answers the investigation question.

The following are the weaknesses of the investigation:
- The question has an influencing factor of privacy. Asking for a job title may cause some students to be uncomfortable or they may not give a truthful answer. Instead, Henry can list the different areas students may work, such as retail, fast food, another restaurant, babysitting, or construction.
- The display method is good and shows the comparison of the different jobs students perform compared to the whole population. However, a bar graph could also be used to show the frequency of how many students work in the different areas
.
The following are the strengths of the investigation:
- The sample chosen is very cost- and time-effective..
- The results will be representative of the population.