Developing and Implementing an Action Plan

Your action plan is a logical sequence of specific steps that must be carried out to test your hypothesis. Typical steps in an action plan include:

1. State your hypothesis.
2. Determine what data needs to be collected.
3. Decide how these data should be organized.
4. Decide how these data should be illustrated.
5. Determine what analysis needs to be done on these data.
6. Draw a conclusion based on your analysis.
7. Evaluate the quality of your investigation.
8. Write a report of your investigation and its results.
9. Develop the presentation of your investigation.
10. Establish time lines for each step of your plan.

Example 1 Drafting an Action Plan

Outline an action plan for investigating the relationship between driver age and number of accidents.

Solution

1. **Hypothesis** The graduated licence system in Ontario has resulted in a dramatic decrease in the number of accidents involving teenage drivers.

2. **Data Collection** The table in section 9.1, question 6 on Vehicle Collisions in Ontario is a starting point for data collection. However, the data given in the table is only for one year. You will need accident data for other years, including the years before and after the introduction of graduated licences. You will need the data separated by age. You may also want the data separated by gender, or by region. You may want to consider other variables, such as driving for pleasure/work, accidents by time of day, accidents involving impaired drivers, accidents by type of vehicle, and so on. **Appendix C: Research Skills** on page 594 will help you with your data collection.
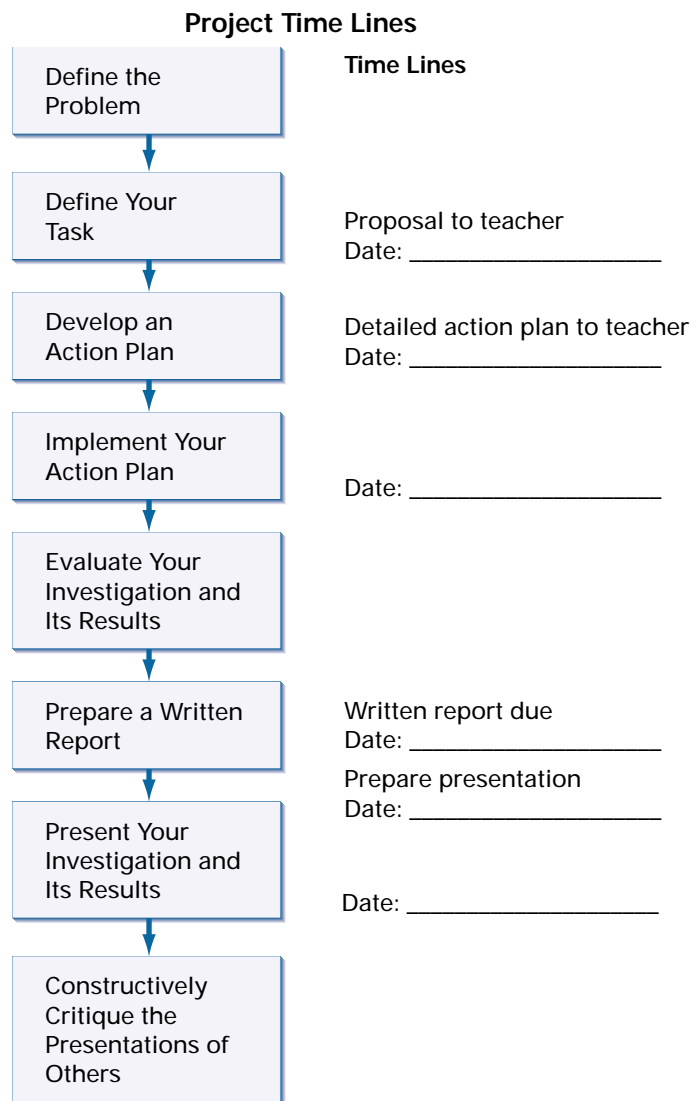
3. **Data Organization** The data should be organized to allow you to test your hypothesis. This means you will need to isolate the effects of the graduated licence system from other factors such as population that may have changed over the years you are examining.

4. **Data Presentation** When presenting the data, you need to keep in mind that you will be presenting these data both in your written report and in your class presentation. You may want to use bar graphs, circle graphs, line graphs, or tables to present your data. You also want to choose ways of presenting your data that help address your hypothesis. Note that this does not mean distorting the data by using inappropriate scales or ignoring outliers and data that does not support your hypothesis. You are testing the validity of your hypothesis, not trying to convince your audience of the correctness of your claim.

5. **Data Analysis** Use the tools you have learned in this course to analyse your data. Summary statistics, measures of dispersion, analysis of outliers, regression, and other techniques may be appropriate. It may be possible to perform a formal hypothesis test on your data. You should be able to relate your results to probability theory and probability distributions, where appropriate. You may be able to use a simulation to test your results. The choice of data analysis tools will depend on the hypothesis that you are testing.

6. **Conclusion** You should be able to state whether your results support or refute your hypothesis. You should also be able to indicate how strong your evidence is.

7. **Evaluation** Reflect on your conclusion as well as your entire investigation. Section 9.4 gives more detail on evaluating projects.

8. **Written Report** Your report should outline in detail your investigation and its conclusions. It should include all the parts of your action plan, the raw data (usually in an appendix), footnotes or endnotes, and bibliography. Section 9.5 gives more detail on writing reports.

9. **Presentation** Your presentation should be a summary of your investigation and its results. Section 9.5 and **Appendix D: Oral Presentation Skills** on page 598 will help you develop your presentation.

10. **Time Lines** Although listed last, time lines must be established and met for each stage of your project. It will not be possible to complete a project of this size in a short, restricted time. The following diagram may help you to establish time lines for this project.

Once your action plan has been developed, it must be implemented. At the implementation stage, it may be necessary to refine or even redefine your problem. Possible reasons for this include:

- Data is insufficient to test your hypothesis.
- Data is contradictory making it impossible to test your hypothesis.
- Question is too broad resulting in too much data to organize efficiently.
- Available data is of the wrong type for testing your hypothesis.
- Analysis requires techniques beyond the scope of this course.

Project Time Lines

Define the Problem	
Define Your Task	Proposal to teacher Date: _____
Develop an Action Plan	Detailed action plan to teacher Date: _____
Implement Your Action Plan	Date: _____
Evaluate Your Investigation and Its Results	
Prepare a Written Report	Written report due Date: _____ Prepare presentation Date: _____
Present Your Investigation and Its Results	Date: _____
Constructively Critique the Presentations of Others	

Time Lines

Practise

1. Select three of the hypotheses you developed in section 9.2. For each hypothesis, develop an action plan.

2. Review the action plans of at least two other members of your group or class. Make constructive suggestions to help your classmates improve their action plans.

Moving Your Project Forward

Develop a detailed action plan for your culminating project.