9.2 Defining Your Task

Once you have posed a problem that you want to investigate, you need to clearly define exactly what your task will be. This definition will usually involve developing a **hypothesis** or thesis statement. You will then develop and implement an action plan to test your hypothesis.

Example 1 Tuition Fees

Suppose you plan to investigate the effect of increased tuition fees on university accessibility. State two possible hypotheses you could investigate on this topic.

Solution

One hypothesis might be: "Increases in tuition fees over the last ten years have forced large numbers of middle class students to give up on a university education."

Another hypothesis could be: "Increases in tuition fees over the last ten years have allowed universities to broaden the range of specialty programs offered."

Example 2 Drive Clean Program

Is there a connection between the number of defective vehicles identified through the Drive Clean program and the number of car accidents in a particular region? State at least two possible hypotheses.

Solution

Three possible hypotheses are:
1. There is a direct connection between the number of car accidents and the number of defective vehicles identified through the Drive Clean program.
2. The number of car accidents in a region has no connection to the number of defective vehicles identified through the Drive Clean program.
3. The number of defective vehicles identified through the Drive Clean program in a region has reduced the number of accidents.

Notice that in the examples you are not initially stating that your hypothesis is true. You are taking a position, which you will test by collecting and analysing data. Your hypothesis will determine what data you need to collect, and will drive your action plan.

Practise

For each question, state a hypothesis that could be tested.

1. Should car insurance premiums be related to driver age?

2. How is performance on standardized tests related to intelligence?

3. Is it possible for a major league sports team to make money given the large salaries of professional athletes?

4. Can future performance of the stock market be predicted with reasonable accuracy?

5. Should the colour of your car influence your car insurance rates?

6. Does it rain more often on the weekend?

7. Is income related to level of education?

8. Should we recycle 100% of our garbage?

9. Is the likelihood that a criminal will reoffend related to the severity of sentences for crimes?

10. Is the retail price of gasoline related to the price of crude oil?

11. Is life expectancy affected by celebrity?

12. Does the age at which a child learns to read affect his or her probability of going to college or university?

13. Can a model be devised to efficiently optimize school bus schedules, garbage collection, or recycling pick-up?

> **Moving Your Project Forward**
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> Refer to the culminating project question you posed in section 9.1. State one or more hypotheses for your culminating project. Be sure to present your hypotheses to your teacher.