

My Science Investigation Student Booklet

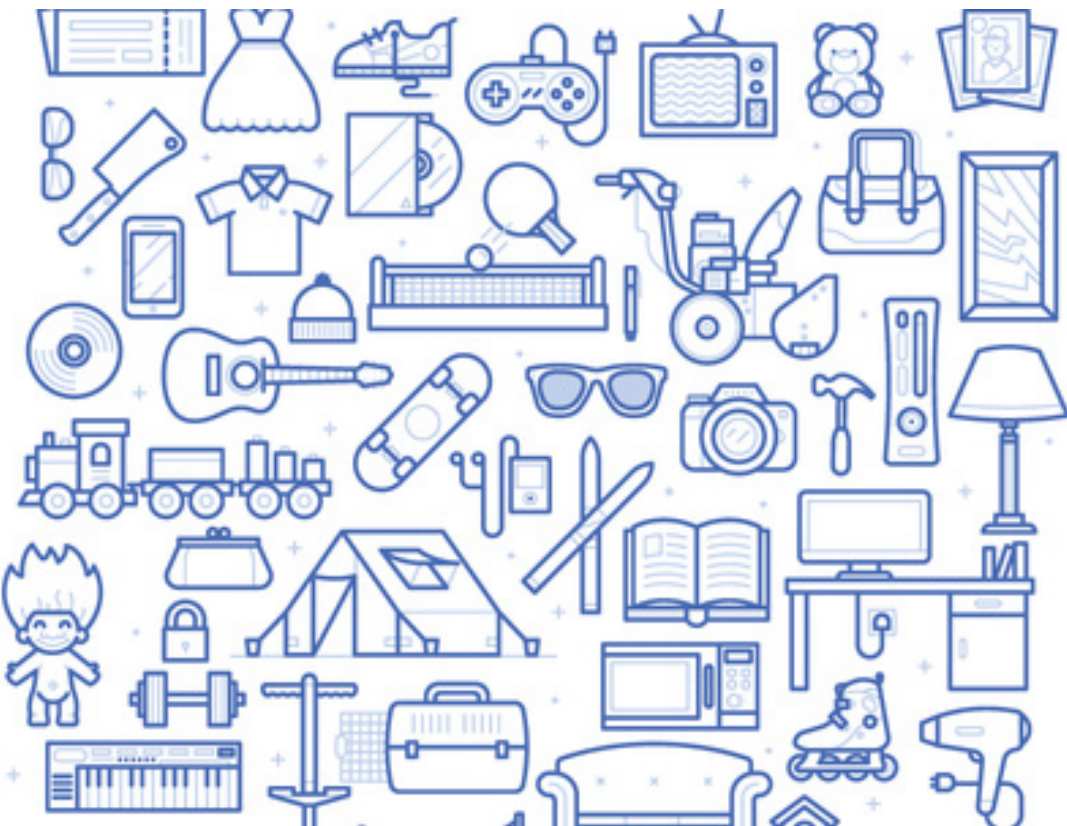
ASK YOUR TEACHER HOW THIS
BOOKLET CAN EARN YOU A
**CSIRO CREST
AWARD**

ACTIVITY 4.1

CHOOSING A SUITABLE QUESTION TO INVESTIGATE

1A Exploring your ideas

The tough part about scientific research is coming up with a good idea. You should take time to select a question to investigate that is original, realistic and within your capabilities. You might get some ideas from past experiences, science lessons, newspapers, magazines, documentaries or websites. Think about something that really interests you and that you care about (eg your sports, hobbies).



List below anything that you are interested in: sports, hobbies, etc.

Now that you have several topic areas, brainstorm a list of questions for possible investigations. Try to be specific and choose questions that would require you to carry out an investigation to discover the answer. Questions like ‘what is mold?’ can be answered by looking up the dictionary, encyclopedia or doing a web search, so why bother carrying out an investigation?

Use the table below to help you generate your questions. An example is given.

Possible topic area	Ideas I have about this topic	Question I could investigate	What could be Changed?	What could be measured or observed?
Sports	What makes soccer balls travel further?	Does the covering on the soccer ball affect the distance it travels?	Different covering on the ball	Distance the ball travels
Gardening	How do plants grow?	What amount of water is best to grow tomatoes? What type of soil is best to grow gerberas? Do different coloured lights affect the growth of daffodils?	Amount of water Different soil compositions Different colour films on a light source	Height, growth rate of tomatoes Height, growth rate of gerberas Height, growth rate of daffodils

Possible topic area	Ideas I have about this topic	Question I could investigate	What could be Changed?	What could be measured or observed?

Strengths of a worthwhile question:

- is it possible to do?
- Is it relevant (personally, locally, nationally, internationally)?
- Is it testing only one idea?
- Am I going to enjoy this investigation?
- Does it expand on existing research?
- Does it address a worthwhile problem?
- Would the results answer a specific question?
- Will this help you answer a question you've been wondering about?

Write your chosen question here

Researching your question

Now that you have your question you need to do more detailed background research about this topic to help design your investigation. Your library would be a useful starting point. Talk to your teacher librarian for assistance. Use different sources such as books, Internet, magazines, newspapers, journals etc. Record any useful information you have found. Make sure you record where you found this information as you will need to include it in your bibliography/acknowledgements of your report.

Useful information found	Source of information (record title of book, web address etc)	Date searched

1. What will you change (independent variable)?

2. What will you measure (dependent variable)?

3. What will you keep the same (controls)?

4. My hypothesis (clear, specific, testable).

5. My prediction:

6. Why I think this may happen:

Exactly what will you do? Write down the steps you will follow like a step-by step recipe (use numbers). Be specific, define sizes and include how many times you will do the investigation and how many replications you will do in each investigation. What data are you collecting? How will you ensure you obtain reliable results? Will you need to have a control to compare your results to?

This image shows a full page of blank, white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There is a vertical margin line on the left side, creating a narrow left margin. The paper appears to be from a notebook or a standard ruled document.

List the equipment you need and where you will access it from. Include any equipment such as data loggers, digital or web camera for recording your data etc.

Equipment needed	From school	From home	Other source

Recording results and making observations

Record all your observations and data as you conduct your investigation. Don't forget you are carrying out a fair test so be consistent in how you collect your measurements. You can also take photos of your investigation to include in your report.

Make sure you also record any problems you encounter and what you do to overcome them.

Now that you have gathered your data you need to work out what it might mean. The questions in this section will help you.

Thinking about the results (the evidence):

1. What happened during your investigation?

2. If appropriate, use a graph to summarise and show your results more clearly.

3. Are there any patterns, trends or relationships evident from your results?

4. What do the results tell us about your original question?

5. What do the results tell us about your hypothesis?

6. In what way was the result different to your prediction?

7. Did you have any unexpected results? Why do you think these occurred?

8. Are your results reliable?

9. Using scientific language, try to explain the observable results.

10. What improvements might you make to your experimental design?

11. Further things that could be investigated:

12. Write a conclusion for your investigation:

**Congratulations! You have now completed
your investigation and are now qualified for a**

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