

Doing a Project

Hints and tips

This section is placed after Chapter 3 to ensure that students have had time to develop some laboratory skills and experience in designing experiments. However, projects can be attempted at any time during the course of the year, and may be better done in the second half of the year when students have had the opportunity to complete chapter assessment tasks.

The projects are ideally assessed using rubrics which inform students of what is required to achieve a particular standard. The rubrics for the assessment tasks on the Teacher Edition CD give students experience in this form of assessment technique.

As you worked through the first few chapters of this book you may have found something of special interest to you that you would like to work on by yourself or in a small group. You might like to extend one of the investigations in Chapter 3. For example, you could investigate the reactions of metals with acids or make a carbon dioxide fire extinguisher. You might like to investigate some other reactions not in the chapter, eg using electricity to cause reactions.

If you do a *student research project* like this you will not simply be following instructions in a book. A project involves you deciding what needs to be done, then doing it, and reporting your results to others.

Choosing a project

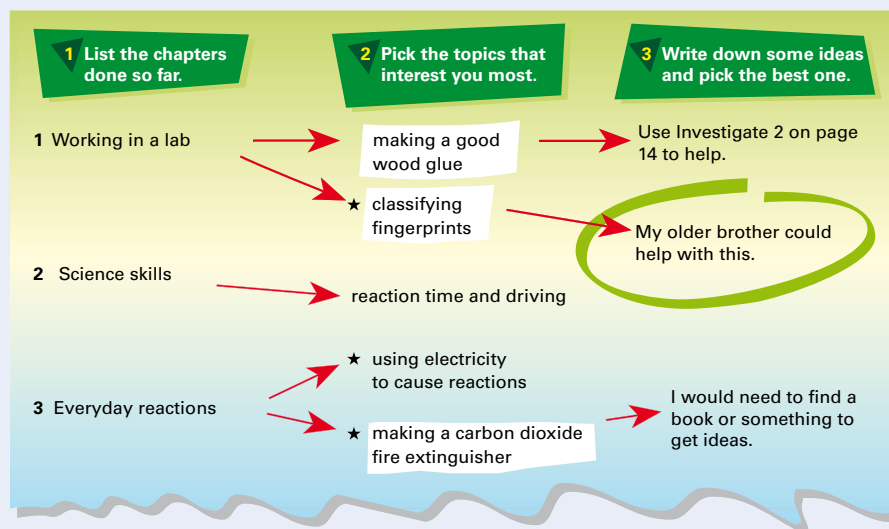
There are many different types of science projects that you can do; for example,

- laboratory experiments
- designing and building things
- field work
- surveys and library research.

The diagram below shows how one student chose her project by starting with the topics in *ScienceWorld 1*.



Derrick Roberts, a Year 10 student at Newington College in Sydney, won a BHP Billiton Science Award for investigating whether the diet supplements we buy really work.



IDEAS

- 1 Look through this textbook and note down the topics that interest you the most and that you would like to know more about. Mark the ones you think would be suitable for a student research project.
- 2 Write down some ideas for projects. There are suggestions in some of the **Challenges** and **Try this**, and many of the investigations and experiments can be extended into projects.
- 3 Read through the following list of projects that other students have done. You may find something that interests you. Check the websites on page 67 for further ideas to get you started.

Prevention of erosion along the banks of the Murray River.

Construction of a better cleaning device for a fish tank.

Construct a web site to communicate how human activities affect the Great Barrier Reef.

Does driving a car at 80 km/h rather than at 100 km/h reduce fuel consumption?

Imagine you are an endangered animal. Develop an advertising campaign to try to improve your situation.

Designing a better mousetrap

Create a device to alert you when it is raining so that you can get the washing off the line.

Does the phase of the moon affect the growth of plants?

Make bricks out of various materials and test their strength.

Finding underground water using a forked stick—does it work?

- 4 Consider each of your ideas in turn. You will probably ask yourself questions like these:
 - Am I really interested in this topic? Will anyone else be interested?
 - Can I get the equipment and materials I need?
 - Can I get extra information on the topic?
 - Can I complete the project in the time available?
 Talk with teachers and other people about your ideas. Finally, pick the project you think would be best for you.
- 5 Read through the hints on the next page, then discuss with your teacher when you will do your project.



HINTS ON DOING YOUR PROJECT

- 1 Write up a brief outline of what you plan to do. Show this to your teacher who will give you helpful suggestions and then give you the okay to go ahead. *Do not attempt the project without your teacher's approval.*
- 2 Plan what equipment and materials you will need for your project. Check what is available at school, what you can get from home and what you can borrow. You don't always need proper laboratory equipment. For example, you could use glass jars instead of beakers, or measuring jugs instead of measuring cylinders.
- 3 You will be doing most of the project at home so make sure your parents know all about the project. Plan your time carefully, by dividing the project into stages. An example of a plan for a 7–8 week project is shown below.

Selecting a topic	1 week
Finalising topic & preparing plans	1 week
Doing project	4–5 weeks
Evaluating results & preparing report	1–2 weeks
Presenting report	1 day

- 4 Keep a project log book. This will be very useful when you prepare your report. It could include notes you have taken from books, photographs or drawings of your experiments, tables of data, drawings or plans of a model at various stages of construction, etc.
- 5 If you are going to do experiments, you should follow these steps:
 - Write down the aim of the experiment. This may be a question you are testing; for example, *What conditions are needed for iron to rust?*
 - Make sure any tests you do are fair. To do this you need to change something, measure something and keep everything else the same.
 - Do the experiment, and collect and record data. A computer spreadsheet is useful here.
 - Duplicate your tests for more accurate results. For example, if you are germinating seeds, set up three or four pots for each test, not just one.

Remember, there are no incorrect answers when doing an experiment—only *unexpected* ones.
- 6 You will need to prepare a bibliography as part of your report, so keep careful notes of any books, magazines and websites you use.

HINTS ON PREPARING A REPORT

- 1 Select the most appropriate form for your report; for example, a written summary for the teacher or other people, a display for the library or science contest judging, or a talk using a Microsoft PowerPoint presentation. You might like to include photos taken with a digital camera in the presentation.
- 2 Be honest in your reporting. In your discussion include difficulties, errors and results you cannot explain.
- 3 Make sure that your report has a conclusion. Remember, doing the project may be the most important thing for you, but most people will want to know how successful you were in achieving your aim.
- 4 Ask your teacher about entering your project in a science contest. (See the websites on the next page.)

You might like to use Microsoft PowerPoint to present your project. Open the ICT skillsheets on the CD to see how this can be done.

Working
with
technology

WEBwatch

Go to www.scienceworld.net.au and follow the links to the websites below.

Double Helix Club

This site has a list of cool experiments you can do yourself. If you join the club you will receive a magazine six times a year and you can go to regular club events in your local area. You can even work with some of Australia's leading scientists doing real research. For example, in 1995–1997 club members participated in a Dung Beetle Crusade in which they mapped the distribution of dung beetles across Australia and introduced beetles to areas with low numbers.

Scl-Journal

On this site you can browse through research projects done by other students. You can also publish your own and comment on other people's projects.

Science Fairs

The site has a list of ideas for science projects and has links to many useful websites.

Great Barrier Reef Marine Park Authority

There are ideas for marine science projects on this site.

Student Projects

This site has project reports done by students.

CREST

CREST stands for Creativity in Science and Technology. You can look up current and past projects and CREST schools in your state.

BHP Billiton Science Awards**STAQ Science Contest****SASTA Oliphant Science Awards**