Activity 5.4
Investigating the effect of temperature on the activity of catalase

Skills
AO3.1 Using techniques, apparatus and materials
AO3.2 Planning
AO3.3 Observing, measuring and recording
AO3.4 Interpreting and evaluating observations and data
AO3.5 Evaluating methods

Safety
Wear eye protection if available.

Hydrogen peroxide is a powerful bleach. Wash it off with plenty of water if you get it on your skin.

You are going to plan this investigation yourself. You can use ideas from Activities 5.1 and 5.2 to help you.

You can vary temperature by using a water bath. Your teacher may be able to provide electrically controlled water baths. If not, you can make one by placing a beaker of water on a tripod and gauze over a Bunsen burner. You can make cold temperatures by using ice. Your teacher will show you how to do this.

You need to think about each of the following points carefully. Once you have an idea about how you will do your experiment, write it down as a list of points. Then think through it again, and make improvements to your plan. Once you are fairly happy with it, show your teacher. You must not try to do your experiment until your teacher says that you may begin.

- What is the hypothesis you are going to test? (hint: use similar wording to the hypothesis in Activity 5.2. Also look at section 5.2, point 3.)
- What apparatus and other materials will you need for your experiment?
- What will you vary in your experiment? How will you vary it?
- What will you keep the same in all the tubes or beakers in your experiment? How will you do this?
- What will you measure in your experiment? How will you measure it? When will you measure it? Will you do repeat measurements and calculate a mean?
- How will you record your results? (You can sketch out a results chart, ready to fill in.)
- How will you display your results? (You can sketch the axes of the graph you plan to draw.)
- What will your results be if your hypothesis is correct? (You can sketch the shape of the graph you think you will get.)

Once you have approval from your teacher, you should do your experiment. Most scientific researchers find that they want to make changes to their experiment once they actually begin doing it. This is a good thing to do. Make careful notes about all the changes that you make. Finally, write up your experiment in the usual way, including:

- a heading and the hypothesis that you tested
- a diagram of the apparatus that you used and a full description of your method

- a neat and carefully headed table of results including means if you decided to do repeats
- a neat and carefully headed line graph of your results
- a conclusion in which you say whether or not your results support your hypothesis
- a discussion in which you use what you know about enzymes to try to explain the pattern in your results
- an evaluation in which you explain the main sources of error you feel might have affected the reliability of your data
- an evaluation of your method.