

DIY science

Set up some simple hands-on science activities for students to try.

Things to consider

- The scientist is highly unlikely to have been provided with funding to purchase resources for demonstrations or activities, and schools have very limited budgets for equipment. But the good news is that there are many activities that can be done with basic, cheap equipment that is available from supermarkets or chemist shops.
- Many high schools will have a lab assistant who will have a good knowledge of the equipment and consumables available in the school and may be able to help set up experiments. The scientist may like to get in contact with the lab assistant directly.
- Some scientists may be able to borrow equipment from their workplace, but this is not expected or required. There are other organisations that sometimes lend scientific equipment to schools, such as science centres, museums or even (in the case of primary schools) the local high school.
- Be aware of any health and safety issues. Work together and plan carefully to minimise any risks to students.
- While most activities are simple to do, some lend themselves to more complex science concepts than others. Be aware of the students' levels when choosing activities and discuss your plans (including the language you'll use) with your partner in advance.
- Where possible, choose activities that relate to the scientist's area of research, or find activities that the scientist feels comfortable explaining.

Ideas

- There's a wide range of hands-on activities online at www.csiro.au/diy and www.csiro.au/scope (click on 'episodes' at top right, then select an episode of interest to see the related activity). All include a basic explanation of the science as well as instructions, and all use simple, cheap equipment and consumables.
- For more ideas, subscribe to Science by Email (www.csiro.au/sciencemail), a free weekly email newsletter that includes a hands-on activity and other resources.
- Develop your own hands-on activity (or adapt an existing one) to help explain some aspects of the scientist's work to students. If it's successful, send it to the *Scientists in Schools* team so we can share it with others!
- You could demonstrate the activity to the students, or provide sets of equipment so that groups of students can do the activity themselves. Discuss the science behind the activity as a class afterwards.
- The hands-on activities could form the basis of a science fair. See the following worksheet and lesson plan for more detail. The scientist could invite their colleagues to the science fair, or offer to host the science fair at their workplace. It's a great way to showcase the organisation's involvement with the school.



Worksheet - DIY Science Fair

Science fairs have become popular events in many schools. Science fairs may be held in a single classroom or across a school region. There are also state-level, national and international 'science fair' competitions.

Science fairs allow students to explore an area of science that they are particularly interested in. In the process of developing their project they will undertake self-directed learning and cover one or more of the science concept strands.

By presenting their work at a science fair, students will need to learn how to communicate their project to an audience. This is usually done in the form of a poster or display, but students will also answer questions from people viewing their project. Students need to be able to

- provide concise explanations of the science verbally and in writing
- present their information in an interesting and eye-catching way, including diagrams or pictures where appropriate
- explain their particular interest in the project and why they chose to study it.

Science fairs can be run in different ways. In this activity, we suggest you hold a science fair based around hands-on science activities such as those in the 'do-it-yourself science' area of the CSIRO website (www.csiro.au/diy). Consider holding the science fair at the scientist's workplace or inviting the scientist's colleagues to showcase your partnership.

Process

Note: this is a suggested set-up only. You should adapt this to suit the students and school environment. The size of the science fair is limited only by your enthusiasm and the support and interest from the rest of the school, the school community and the science organisation.

More comprehensive instructions and ideas have been provided on our website at www.scientistsinschools.edu.au/resources/index.htm.

Before you start, choose a date and venue for the science fair and make plans for the science fair with the rest of the school and/or science organisation. Invite parents, other classes in the school and your colleagues to visit the science fair.

A: Teacher or scientist demonstration

1. Choose a hands-on activity and run it as a demonstration with the class.
2. Then as a class, discuss and brainstorm:
 - One sentence that introduces the activity
 - A paragraph that describes what the activity is demonstrating (use words like 'what', 'how' and 'why')
 - A diagram or picture that helps explain the activity
 - One way that the science in the activity is useful to us
 - Three questions that someone might ask about the activity, and the answers.
3. Create a demonstration poster to show the class how this information could be displayed.

B: Student activity

1. Ask students to work in pairs and select an activity that they find interesting. Tell them that they'll be presenting this activity at a science fair.
2. Have students fill in the planning worksheet to make sure they know what they need and what they're going to do.
3. Students can then carry out the activity and prepare their presentation or display.
4. During the science fair, each student should spend half the time standing at their display and answering questions; and half the time looking at other students' displays. Make sure that there is always someone at each display to answer questions.
5. If you like, give each student five stickers (dots are fine) to 'award' to the displays any way they like. Discuss with the students why they have allocated the stickers in the way they have. You could present a prize to the display with the most stickers.



Worksheet - DIY Science Fair Planning

Title of science activity:

Things we need to collect to do the activity and make the display:

One sentence to introduce the activity:

A paragraph that describes what the activity is demonstrating:

A diagram or picture that helps to explain the activity:

One way the science in the activity is useful to us:

Three questions that someone might ask and the answers:

On the back of the page, draw a diagram to show what the display will look like.