

extratime for Science

Introduction

Making sense of the world around them requires young people to engage with, and understand, scientific concepts and principles. But this learning does not have to be restricted to the curriculum.

A varied menu of study support activities such as science clubs, is a key element of the 'core offer' of extended services that all schools are expected to provide by 2010. Evidence shows that participation in such activities can lead to improvements in young people's self-esteem, achievements, attitudes to learning, classroom behaviour, and school attendance.

For more information on the benefits of study support/oshl, visit www.continyou.org.uk/studysupportetc.

About this guide

This Extra Time Science Mini Guide will give you lots of ideas for introducing science to your study support/oshl programme.

Whether you want to set up a science club or introduce a scientific 'flavour' to other clubs, this guide will help you to get started. If you are an experienced science teacher, it will give you the framework to introduce science to your students and club members outside the formal curriculum. If you are not a teacher, but have a passion for science, it will also provide a range of tried and tested ideas that you and your members can enjoy.



Why run a science club?

Including science in study support activities can be an effective way of changing the misconception that science is all about Bunsen burners, chemical formulae and physics equations.

With the take up of science subjects on the decline, boys and girls of all ages, backgrounds and abilities can develop their skills and learn about the broader application of scientific knowledge in the modern world. By exploring scientific concepts through their own interests, and at their own pace, members will better understand how science is relevant to their own lives.

What can you achieve through science clubs?

As well as the general benefits of participating in study support/oshl, science club members will benefit in more specific ways. For instance, they will:

- have an increased enthusiasm for science subjects
- broaden their understanding of the range of science-related careers
- increase their knowledge and understanding of key curriculum concepts, such as 'scientific enquiry', 'materials and their properties', 'physical processes', and 'living things'
- develop skills that they can apply to other areas of learning, such as problem solving, evaluation, and analysis.

Benefits can be generally grouped into personal, practical, learning, or life outcomes. These outcomes will form the basis of the aims and objectives of a science club, and will help you to determine whether you want to target a particular group of pupils, such as underachievers.

For more information on all of these issues, and advice on monitoring and evaluating the impact of your club, visit www.continyou.org.uk/studysupportetc.

Top tip!

It is worth involving your members as much as possible in deciding on, organising and evaluating the activities. Not only will it give them a greater sense of ownership, but they will also have an increased commitment to making the club a success.

What should a science club 'feel' like?

Because participation is voluntary, whether or not the club is a success will depend on the culture you and your members create. Try to develop a club where:

- the atmosphere is informal, fun and relaxed
- members are treated as individuals and feel that their voice is encouraged and listened to
- activities are different from lessons, and members have greater control over their own learning
- activities are undertaken in a controlled and safe manner, with appropriate health and safety precautions and risk assessments.

Getting these elements right makes a sound basis for a successful club.

How can a science club be different from science in the classroom?

A science club does not have to follow the national curriculum, which gives you the freedom to choose topics that appeal to your members or target group.

Because scientific concepts underpin so much of our daily lives – from the weather to sport, and from cookery to travel – there should be no shortage of themes to choose from.

Finding an alternative ‘angle’ to your topic will be popular with pupils of all ages. You can be sure that anything that an adult may find slightly unsavoury or that creates an explosion, noise or mess will appeal to your members!

Whatever subject you decide to investigate, it is a good idea to plan how the sessions will develop over the term.

Top tip!

To shape the first term’s activities, spend a session getting members to interview each other about their hobbies and interests. Use the findings to shape your programme.

What activities should you provide, and how?

A wide range of local people, businesses and services are available that can provide opportunities to enrich a science club. For example:

- ask local manufacturing companies if you can arrange a tour of their facilities, or invite a visiting speaker to explain the science behind the research and development of products
- approach the Scene of Crime Officer at your local police station to show members how forensic science is used in solving crimes
- invite speakers from your local environment agency, or your water, gas or electricity provider, to explain the importance of science in their work
- ask a local chef to join the club to demonstrate some of the science that takes place in the kitchen
- find out if there is a Science and Engineering Ambassador in your area who could be attached to the club. Your local SETPOINT can help with this (see page 7).

It’s a good idea to encourage members to take responsibility for approaching guest speakers, organising visits, and researching these and other club activities. This will help develop key skills and encourage independent learning.

By working with your members, you can develop an imaginative range of activities that will enable them to include subjects such as citizenship, design, and history into their scientific exploration. The tried and tested ideas on page 4 will give you some starting points for this.

Tried and tested ideas

The ideas given here can form the basis of a term's work or can be integrated into other clubs. They are not age-specific and can be adapted to suit whatever group of pupils you are hoping to attract.

1 Playing

Playtime for all ages offers an array of possibilities to investigate how science impacts on everyday sports and games. Members can make yo-yos, catapults or basic musical instruments, unravel magic tricks, examine the technology behind CD-readers, or discover how the pressure of a ball affects its ability to bounce.

2 Creating/making

Daily routines demonstrate a wide range of chemical reactions, such as cooking or washing. Look at the science of baking a cake, cooking pasta, popping corn or making fudge – or challenge members to make the best dirt-busting soap or sweetest smelling perfume.

3 Observing

Making a pin-hole camera, zoetrope, kaleidoscope or periscope will show members how the brain interprets the images that are picked up by the eye. Members could also try other easy activities focusing on how the brain processes vision, such as optical illusions and practising mirror writing.

4 Living

Constructing a pond in the school grounds that members can look after is a practical way of getting to grips with how different plants and animals survive, and what influences their growth. From frogspawn and flowers to perch fish and plants, there is a wide range of species that members can experiment with and monitor over the course of the year. Alternatively, if space allows, create two garden areas – one organic and one 'controlled'. Members can grow and monitor the same plants in both environments and create a photo diary of the differences.

5 Building

Construction-based activities, such as making robots, rockets or building bridges, are fun ways to introduce members to engineering concepts. These ideas can easily be developed into team challenges, such as robot wars or a competition to see whose rocket will launch the furthest, and whose bridge can bear the greatest load.

6 Preserving

Members can make time stand still by mummifying a fish (see www.exploratorium.edu), preserving photographs, examining a fictitious crime scene, and extracting DNA. These fascinating experiments will enable members to explore the importance of scientific processes in preserving history, enabling others to piece together and understand past events.

7 Moving

Whether you choose to use a kit or recycle elastic bands and cotton reels, making model aeroplanes, cars, hovercrafts or go-karts are a great way of learning about the principles of motion. Members can develop practical skills, and are introduced to concepts such as how design affects performance, simple mechanics, and the effect of forces.

8 Debating

Choose a 'hot' topic, such as global warming, euthanasia, animal testing or genetic engineering. Set members the task of researching the subject and participating in a debate. An alternative approach is to get members to write and perform a short piece of drama that represents their findings.

9 Ground breaking

Fizzy drink bottles, bicarbonate of soda, and a dash of vinegar are the basics of creating miniature erupting volcanoes and exploding geysers. These activities are sure to get members thinking about the effects of natural science. You could develop this further by looking at other natural phenomena and challenging older members to come up with practical solutions to real-life problems, such as designing a quake-proof building.

Case study

Students at Sandwich Technology School have embarked on an ambitious after-school project that brings together science, technology and the arts.

Having designed and built two bio-domes in the school grounds, students are now growing food crops under different conditions to observe and compare the effects on the environment.

A further spin-off activity has involved students making 'light boxes' to illuminate images from the natural world.



Essential checklist

Below is a summary of all the main issues you will need to consider as you set about planning your study support/oshl science club. Taking the time to get everything right before you start will really help to sustain your club.

Find out what's needed

- What gaps are there in your existing study support/oshl programme that could be filled by staff with special skills, or an interest, in science?
- What do you want to achieve through your club?

Find the right time for your club

- If you are introducing a new club, when is the best day/time of day and what is the best frequency to attract members?
- What might affect pupils' ability to come to your club, for example, transport, other clubs, and community commitments?

Find the right staff

- Who is the best person to run your club, and how many staff will you need for each activity?
- Can you use older pupils to help run activities?

Involve others

- What existing/new partners could support your club?
- How will you approach them?

Cover the costs

- What resources (money and otherwise) will you need to provide your planned activities?
- What funding are you eligible to apply for and how long will the application process take?

Keep it safe

- What are the health and safety considerations of your provision, including any training and checks for staff and insurance cover for activities?
- Do you need to undertake a risk assessment for your planned activities, including off-site visits?

Get pupils involved

- How can you involve pupils in developing and running new activities?
- Have you asked pupils what they are interested in?

Decide which pupils to target

- How will you identify which groups or individuals will benefit from your club?
- How will you encourage them to take part?

Promote your club

- How can you give your science club its own identity within the school?
- How can you turn science activities into publicity opportunities for the school?

Keep it going

- How will you review the success of your club and decide what you need to change in order to improve it?
- Who will you ask for their views on your science activities, and what will you ask them?

Useful resources

Below is just a handful of the hundreds of excellent science-related websites that exist to support learning in this area.

BBC – www.bbc.co.uk/schools and www.bbc.co.uk/sn

Excellent websites providing extensive information, free resources, activity ideas, and interactive features.

The British Association for the Advancement of Science (BA)
– www.the-ba.net/the-ba/YPP/index.html

Provides advice on developing science club activities.

CSIRO Double Helix Science Club – www.csiro.au/helix/experiments

An international online science club, with free downloadable hands-on experiments and investigations, as well as access to membership.

Exploratorium – www.exploratorium.edu/explore/handson.html

A brilliant site full of low-cost, hands-on activities and experiments that young people can easily undertake at home or in a club environment.

The Making Place – www.the-making-place.co.uk

This site is the legacy of the Making Place science centre. Although still in development, it contains downloadable QCA-linked lesson plans, worksheets and ideas that help children and young people explore scientific principles through hands-on design and technology activities.

National Curriculum online – www.nc.uk.net

Programmes of study and non-statutory guidelines, including notes and links to online teaching resources, with schemes of work by Key Stage.

Planet Science – www.planet-science.com

Run by the National Endowment for Science Technology and the Arts (NESTA), this large website provides the inspiration, resources and downloadable materials needed to create enjoyable science.

The Science, Engineering, Technology and Mathematics Network (SETNET) – www.setnet.org.uk

Contains details of the Science and Engineering Ambassador scheme. It is designed to link schools with volunteers who have an interest in science, engineering, technology and maths, and who aim to stimulate and inspire interest in those subjects. Find out how to contact your local SETPOINT for further details.

The Science Museum – www.sciencemuseum.org.uk/education

Downloadable activity sheets, resources and information for teachers, students and families, complementing both museum and online exhibits. You will need to look around the teachers', parents' and kids' sites to uncover the full range of resources and activities available.

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This Extra Time Science Mini Guide is one of six **free** guides to setting up and running study support clubs:

[Engineering](#)

[History](#)

[Magazines](#)

[Modern foreign languages](#)

[Science](#)

[Sport and maths.](#)

The Extra Time Mini Guides can be downloaded from www.continyou.org.uk/miniguides.

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