

How to... make your *practicals* more sustainable



Each practical class is different, from ecology to molecular biology and will use different resources and create particular wastes. The information provided here is certainly not exhaustive but aims to give you some ideas and pointers towards making your practicals more sustainable.

There are currently few resources dedicated to sustainability in practical bioscience teaching but general sustainability principles can be applied. Some of the tips on this sheet may be for changes in areas beyond your control, however they could form the basis of proposals to put to an estates department or an institutional or departmental environmental committee.

Why bother?

It is important to target behaviour and awareness of waste and resource use at an early stage of a scientist's career. The challenge is to provide students with an in-depth understanding of sustainability and environmental issues¹, giving them a platform to integrate sustainability into their own lives and future careers. As well as teaching sustainability via theory, there is the opportunity for institutions to 'walk the talk' by demonstrating sustainability in practice². It is about institutions operating to the highest possible environmental standards.

Getting the ball rolling

It is likely there are already structures in place for reducing the environmental impact of your institution:

- assess if you are fulfilling all the objectives laid out in the environmental policy³ of your institution in the planning and implementation of your practicals;
- consult with relevant members of staff, especially lab technicians;
- ensure you are aware of relevant Health and Safety and COSHH regulations⁴ and do not make any changes to contravene these;
- identify areas that need attention and, to keep a record of improvements, consider carrying out an environmental audit⁵; and
- assess the needs of staff for professional development and training⁶.

Make some changes



Student involvement - involve students by discussing methods of reducing waste as part of practicals. You could also:

- encourage students to re-use resources and separate out recyclable waste at the end of the practical;
- encourage students to turn off electrical equipment when not in use (unless it has a long warm-up time or would need recalibrating); and
- raise student's awareness of water consumption and encourage modest use of this resource; not only will this reduce the impact of the practical but it will encourage good practice.



Group size - the cost of lighting and heating a room does not change significantly if there are 5 or 50 students, so try to use the full capacity of the room you are working in. For certain elements of practicals working in groups can also reduce resource use and the need for repetition. These economies, however, have to be balanced against the student learning experience.



Handouts - print handouts double sided and on recycled or FSC certified paper⁷, online teaching support and e-learning may reduce the need to have paper copies⁸. Students may print copies themselves, so ensure any copying facilities provided by your institution and department also use environmentally friendly paper and print double sided.



Reusing plastic and glassware - purchase reusable products wherever possible. Although it takes more time to wash and store glassware, over the longer term it reduces cost and minimises wastage. With consumable products use refills⁹ where possible, and certain products advertised as single use, with a little inventiveness, could be reused; e.g. plastic Petri dishes used in one practical could be reused for another where sterile conditions are not essential.



Preparation - consult with technicians about possible methods of saving resources; e.g. making up solutions and buffers in bulk and redistilling certain solvents in-house. Ensure that all containers are clearly labelled, dated and stored so wastage does not occur.



Lab equipment - don't throw away old lab equipment, donate it to a charity^{10, 11} or contact your local schools to see if they could make use of it.



Lab recycling - some wastes produced in practical classes, such as paper and packaging waste, can be recycled¹², careful sorting is necessary to avoid any hazardous material getting into the wrong bin. Ideally clearly labelled recycling bins would be placed

in a visible location in the lab, you could also consider composting any plant waste generated, remembering to autoclave any GM material.



Energy efficiency - switch off electrical appliances when not in use, and check to ensure any power saving modes on lab equipment or computers are switched on¹³. If replacing equipment then consider buying low energy models¹⁴. Make use of natural light by removing anything blocking light from windows and, if possible, arranging desks closer to the windows. Switch to low energy light bulbs and compact fluorescent tubes, and fit mirror reflectors on twin tube fittings¹⁵.



Green purchasing - institutions represent a large section of the consumer market, and purchasing power can really make a difference¹⁶:

- purchase reusable or refillable goods wherever

- possible and avoid disposable items;
- buy recycled or reclaimed products, taking their construction and ease of recycling at the end of the product life into account;
- purchase as locally as you can, reducing transport impact and supporting the local economy; and
- if possible avoid products that must be shipped from overseas



Water - ensure nothing toxic goes down the drain, this includes bleach and some cleaning products. Effective ecological cleaning products are now available for business as well as home use¹⁷. There are many ways to save water; devices can be retrofitted directly to taps or fitted to the pipes in order to control flow rate. For lab use it is important to be able to use full flow rate when necessary, therefore dual flow taps could be appropriate¹⁸. Unfortunately, fittings for standard lab taps are not yet available.

Resources

1. Forum for the Future, Sustainability literacy: knowledge & skills for the future: www.forumforthefuture.org.uk/node/942
2. People & Planet's Go Green Campaign: peopleandplanet.org/gogreen/
3. Envirowise, How to write an Environmental Policy: www.envirowise.gov.uk/Ref012
4. Health and Safety Executive: www.hse.gov.uk
5. Defra, Establishing a Sustainability Management System: www.defra.gov.uk/environment/sustainable/educpanel/furthering/03.htm
6. PP4SD, Professional Practice for Sustainable Development. Book 2: Developing cross-professional learning opportunities and tools: www.pp4sd.org.uk/downloads/pdf/Book2.pdf
7. WRAP: www.wrap.org.uk
8. The Higher Education Academy, E-learning: www.heacademy.ac.uk/ourwork/learning/elearning
9. LabNews, Consumables don't cost the earth: www.labnews.co.uk/feature_archive.php/566/5/consumables-dont-cost-the-earth/
10. Seedling Labs: www.seedlinglabs.org
11. IT Schools Africa: www.itschoolsafrica.org
12. Surrey County Council, Laboratory Waste Recycling and Disposal: www.surreycc.gov.uk/sccwebsite/sccwspages.nsf/LookupWebPagesByTITLE_RTF/Laboratory+waste+recycling+and+disposal?opendocument
13. The Energy Saving Trust: www.energysavingtrust.org.uk
14. Defra guidance on the EU energy labelling scheme: www.defra.gov.uk/environment/consumerprod/energylabels/
15. Energy Conservation Group www.savenergy.co.uk
16. Sustainable Purchasing for Universities: neupg.procureweb.ac.uk/environment.php
17. Ecover: www.ecover.com
18. Even Greener: Dual flow taps: www.evengreener.com/Shop/Water_Saving.html

Labs21 UK has been established to support more sustainable design and operation of laboratories in Britain: www.labs21.org.uk

The Environmental Association for Universities and Colleges (EAUC) is a membership organisation that offers information and best practice sharing around sustainability and environmental issues: www.eauc.org.uk

Take pride in your workplace and inspire others to make the same changes

This "How to" sheet has been compiled by Alzena Wilmot. How to sheets for; field trips, tutorials, lectures and offices are also available.

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