Lectures

Things to consider:

When preparing
- Sit-in on lectures given by other lecturers in your department – see what does and doesn't work first hand.
- Look at other people's reading lists for similar modules; this will give you some ideas.
- Check how many students you will have, where the lecture theatre is, what facilities it has, how the projector works etc...
- If using PowerPoint print out your slides; should the projector fail you'll be prompted for what to say!
- Talk to other lecturers for advice. Ask a lecturer to sit in on one of your lectures early on.
- Find out about the students, what is their previous experience etc...
- Make handouts to support your lecture. These can take many forms, again look at what colleagues produce for ideas – consider leaving space for students to write down ideas, so they can have 'ownership' of the handout.

At the lecture
- Check students can hear you and see the slides.
- Take enough handouts for the students and handouts from previous lectures.

Further information:

Howie, K. & McLaughlin, P. (2006) **'Clickers' in Biology lectures**. Centre for Bioscience Bulletin 19: p11. www.bioscience.heacademy.ac.uk/ftp/newsletters/bulletin19.pdf

Race, P. & Brown, S. (2002) **Lecturing: a practical guide**. London, Kogan Page.

Willmott, C. (2006) **Never again shout, "that WOULD have been useful for my teaching!" at the TV.** Bioscience Education E-journal volume 7 available at www.bioscience.heacademy.ac.uk/journal/vol7/beej-7-C1.htm. A interesting account of the tools available to find suitable broadcasts for use in lectures.

Centre for Bioscience **ImageBank**. A collection of over 5000 copyright-cleared images and diagrams for use in bioscience teaching and learning. The images used throughout this publication are taken from ImageBank. www.bioscience.heacademy.ac.uk/imagebank/

Tutorials

Things tutees will expect you to know
- Which modules they are taking
- How to find out what their timetable is
- Key deadlines
- Exam time tables
- Assignment information
- Credits for modules
- Who are module managers/contributors
- How to get extensions

Additional things it would be useful to know about
- University Counselling Service
- Careers centre
- Accommodation office
- Library information
- University Medical centre
- The Student Union
- Disability services

Useful generic topics for discussion/work
- What is plagiarism?
- How to write an essay
- How to assess a website
- How to search for literature e.g. Web of Knowledge, Intute
- Relevant news items
- Bioethics e.g. xenotransplantation, stem cells, genetically modified crops.

Further information:

Forster, F., Hounsell, D. and Thompson, S. (eds.) (1995) **Tutoring and Demonstrating**. Centre for Teaching, Learning and Assessment, University of Edinburgh/UCoSDA. Available at www.tla.ed.ac.uk/services/tutdems/handbook.htm

Van Damme, M-P. (2004) **Tutorless Tutorials**. LTSN Bioscience Bulletin. 12: p12 www.bioscience.heacademy.ac.uk/ftp/newsletters/ltsn12.pdf

Bioethics Briefings – a series of short briefings that are intended to help teachers in higher education deal with various ethical topics. The briefings are in PDF format, contain a balance of scientific and ethical input, case studies and up to date examples of ethics news items. www.bioscience.heacademy.ac.uk/resources/ethicsbrief.aspx
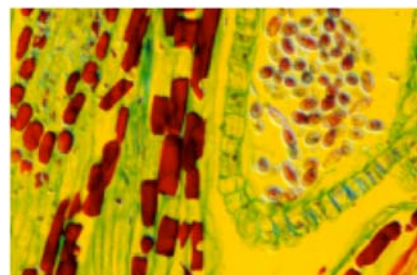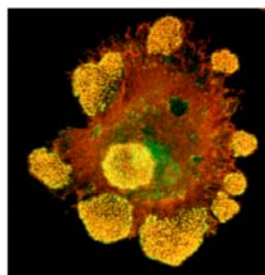
Labwork

Things to consider:
- The intellectual engagement students have with the exercise – are they just following recipes on auto-pilot? The practical work should prepare students for doing final year projects.
- Risk assessments take a long time to fill in and get approved.
- The Disability and Discrimination Act part 4, SENDA (see Accessible Curricula section) - is the practical accessible to all students?
- Provide handouts and encourage students to read them, before the practical so they know what they are going to be doing.
- Consider the previous knowledge and skills of the students.

Further information:

For a longer list see: www.bioscience.heacademy.ac.uk/ftp/resources/practical.pdf

Gibbs, G., Gregory, R., & Moore, I., (1997) Teaching More Students series: 7. **Labs and Practicals with more students and fewer resources**. 67pp. OCSLD, Oxford.   Includes sections on: Reviewing aims and resources; Teaching and assessing the aims of lab work; Alternatives to working in the lab; Doing what you can before and after the lab; Using teamwork; Alternatives to assessing practical reports; Case studies. Well worth reading.

Hazel, E. & Baillie C. (1998) Gold Guide 4. **Improving teaching and learning in laboratories**. HERDSA publications. 77pp [order guides from www.herdsa.org.au/guidescription.php].   This guide is written for both experienced and inexperienced staff who are involved with laboratory classes for science or engineering subjects. The guide can be read in its entirety or specific sections can be reviewed to try to address specific issues.

Hughes, I. (2004) **Coping strategies for staff involved in assessment of laboratory write-ups**. Bioscience Education Electronic journal, Volume 3. available at: www.bioscience.heacademy.ac.uk/journal/vol3/beej-3-4.htm

MacKenzie J. & Ruxton G. (2006) **Experimental Design Skills**. Centre for Bioscience Bulletin. 18: p10 www.bioscience.heacademy.ac.uk/ftp/newsletters/bulletin18.pdf

Useful for students:
Barnard C., Gilbert F., McGregor P. (2001) **Asking Questions in Biology**: Key Skills for Practical Assessments and Project Work 2nd Ed. Prentice-Hall ISBN-10: 0130903701 Coverage includes Statistics and Experimental Design, Data Analysis, Ecology and discovery-oriented laboratory courses and project work.

Jones, A., Reed, R. and Weyers, J. (2002) **Practical Skills in Biology**. 3rd ed. Essex: Longman. OR Reed, R., Holmes, D., Weyers, J. and Jones, A. (2003) Practical Skills in Biomolecular Sciences. 2nd ed. Upper Saddle River, NJ: Prentice Hall. The text in these books covers the skills required in laboratory classes, advice, tips, worked examples, key points and 'how to' boxes.

Fieldtrips

Things to consider:
- Time - of year/weather/tides/nesting birds not to be disturbed etc…
- Risk assessments take a long time to fill in and get approved.
- First aiders - to satisfy Health and Safety, more qualified first aiders are sometimes needed than expected.
- SENDA (see Accessible Curricula section) - if the site is not accessible to all students what can be done about this?
- Contacting land owners - agree what work will happen, even if no input is required from them.
- Brief students well in advance and remind them of times and equipment/clothing they should bring with them.

Things to take with you:

- List of students and separate list of those with asthma, allergies etc
- Departmental phone number (and out of office number if applicable)
- Phone numbers of staff/demonstrators coming with you for when they/you are running late
- Coach company phone number
- Mobile phone (charged)
- Camera
- Clothes for all weather
- First aid kit
- Spare equipment
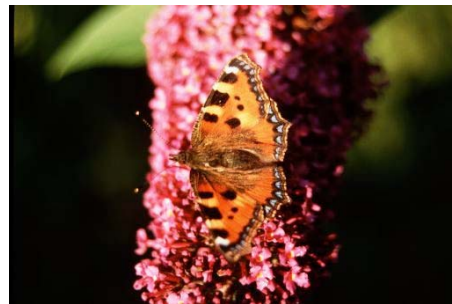
Further information:

Fieldwork Methodology (Barcelona Field Studies Centre) is a website that contains interesting information on approaches to fieldwork relevant to life sciences fieldwork. www.geographyfieldwork.com/Fieldwork%20Methodology.htm

Gravestock, P. and Healey, M. (eds.) (2002) **Six Web-based Guides on Learning Support for Disabled Students Undertaking Fieldwork and Related Activities.** Gloucestershire: Geography Discipline Network.   Although these examples are drawn from geography and earth sciences the majority of situations and scenarios are directly applicable to biological fieldwork. www.glos.ac.uk/gdn/disabil/

Jenkins, A. (1997) **Teaching More Students series: 9. Fieldwork with more students.** 69pp. OCSLD Oxford. Includes: Staff and students' experience of fieldwork; Coping with more students doing fieldwork; Addressing problems of cost and staff time; Attending to safety and discipline; and much more.

Manning, M., Harris, J.A., Maher, W.A. and McQueen, K.G. (1998) **Learning in the Field: A Manual for Conducting Field Classes**, Gold Guide No. 5. Jamieson, ACT: HERDSA. Includes the rationale, structure, approaches and objectives of fieldwork. Explores issues such as logistics and finance, health and safety, social and gender considerations, as well as ways to maximise learning outcomes. Ordered from www.herdsa.org.au/guidescription.php

Nichols, D (ed.) (1999) **Safety in biological fieldwork - Guidance notes for codes of practice.** 4th edition. London: Institute of Biology. A concise account of this vital topic.

Supporting PhD Students

Good supervisors will guide and mentor their students, be a source of information and be a coach and an inspiration!

In addition to overseeing their scientific research supervisors will: give good timely feedback, help with presentations, time management, report writing, and all things that lead to a competent researcher; not to mention preparing students for thesis submission and their viva's.

Further information:

- **Our website** has pages for postgraduate supervisors that cover postgraduate education, training and skills; teaching and demonstrating; postgraduate employability. www.bioscience.heacademy.ac.uk/network/supervisor.htm

- The **UK Grad programme** have a number of webpages and resources for supervisors, including a resource database and a number of networks to enable the exchange of ideas and practice relating to the supervision of postgraduates. www.grad.ac.uk/cms/ShowPage/Home_page

- The **QAA Code of Practice** for the Assurance of Academic Quality and Standards in Higher Education: **Postgraduate Research Programmes** contains guidance for a number of aspects of postgraduate research programmes, including the development of research and other skills. www.qaa.ac.uk/academicinfrastructure/codeOfPractice/

- If your students need **training in research skills** or the presentation of data then the STARS project (Scientific Training by Assignment for Research Students) was intended for final year undergraduate students but produced a number of resources that may be useful to first year research postgraduate students. www.stars.rdg.ac.uk

- **Supervising a disabled student?** You may find the Premia resource database useful. Focusing on disabled postgraduate students, it covers aspects of fieldwork and lab work, how disabled students may find them difficult to access and how this can be improved. www.premia.ac.uk

- **A guide to developments in postgraduate education** by Heather Sears (article from the Bioscience Bulletin 16) is a useful summary of recent publications and policy developments in postgraduate education. www.bioscience.heacademy.ac.uk/ftp/newletters/ltsn16p18+9.pdf

- **Postgraduate pages of the Centre's website** including training and skills; research, reports and thesis writing; employability; teaching and demonstrating. www.bioscience.heacademy.ac.uk/network/postgrad.aspx

Assessment

- Ensure the different types of elements in the learning objectives are reflected in the assessment (e.g. knowledge, understanding and skills).
- Try to make sure there are a variety of assessment methods used during the course. A single type of assessment may disadvantage some students.
- Ensure the assessment methods are appropriate for the teaching style. If the course is primarily taught using problem-based learning it would be inappropriate for the assessment to wholly test factual knowledge.
- Is the assessment timely with relation to assessments in other modules? Ensure the totality of the assessment experienced by the students is reasonably distributed and does not all take place in an unreasonably short period.

Feedback

- Consider the timing: aim to get the feedback to the students quickly. The longer the students have to wait, the less likely they are to do something constructive with it. At least provide feedback to students before they submit their next piece of work – so they can implement it.
- Feedback should be constructive, so students can improve. Remember to highlight any omissions as well as errors.
- Avoid criticism of the person; focus on the work being assessed.
- Words such as 'appalling' and 'disastrous' don't help students improve.
- Words like 'unimprovable' don't help outstanding students to develop either.
- Consider writing exemplar answers. It is sometimes easier to show students what is expected of them than to tell them.

Further information:

Themed Centre for Bioscience Bulletin on Feedback, Bulletin 22 (Autumn 2007)
www.bioscience.heacademy.ac.uk/resources/bulletin

Klappa P. **Assessment of Practical Skills**, Teaching Development Fund project
www.bioscience.heacademy.ac.uk/resources/projects/klappa.aspx

Orsmond P. (2004) **Self- and Peer- Assessment: Guidance on Practice in the Biosciences**. Centre for Bioscience, Higher Education Academy.
www.bioscience.heacademy.ac.uk/resources/guides/selfpeerassess.aspx

Assessment Audit. This is designed to facilitate development of assessment within a course.
www.bioscience.heacademy.ac.uk/resources/audit.aspx

The **FAST project** aimed to examine how students' formative assessment experiences affect their learning. In doing so it looked at how feedback to students can be made more effective by maximising the learning students gain from their assessments. www.open.ac.uk/fast

Bioassess Website is an outcome from a 2006-7 project in Australia, entitled *Enhancing Assessment in the Biological Sciences.*
www.bioassess.edu.au/bioassess/go/home/

The OLAAF (**OnLine Assessment and Feedback**) project has been engaged in developing and disseminating generic guidelines for the construction of Computer-based Assessment with Feedback. www.bbk.ac.uk/olaaf/

Plagiarism

Plagiarism will never be eliminated completely, but course and assessment design alongside educating students as to what plagiarism is, can go a long way towards reducing it.

Some simple ways to avoid plagiarism:

- Ensure students are clear as to what constitutes plagiarism.
- Use different questions each year.
- Explain how to reference other people's work.
- Collect drafts or plans of work (these don't have to be marked) before the submission date, so students have to think about the task and don't panic copy at the last moment.
- Questions that ask students to detail a concept could easily be copied from the internet or books. Questions that are more creative are less likely to already exist. For example 'state the arguments for and against genetic engineering' could easily be copied. If however, you gave students four texts on genetic engineering and asked them to compare and contrast the views expressed in these, the likelihood of thinking and learning increases.

Further information:

The **JISC Plagiarism Advisory Service** provides generic advice and guidance on all aspects of plagiarism prevention and detection to institutions, academics and students. www.jiscpas.ac.uk/index.php

Bobby Elliot's FAQ's covers most **things you'd want to ask on plagiarism**. www.bobbyelliott.com/Plagiarism.htm

Three **plagiarism scenarios** which outline potential plagiarism incidents and are fictitious, yet plausible situations designed to generate discussion but are also useful for individuals to consider how they would deal with the situations. www.bioscience.heacademy.ac.uk/ftp/events/plagiarism/scenarios.pdf

Dawson M.M. and Overfield J.A. (2006) **Plagiarism: Do Students Know What It Is?** Bioscience Education E-Journal. Volume 8 available at www.bioscience.heacademy.ac.uk/journal/vol8/beej-8-1.htm
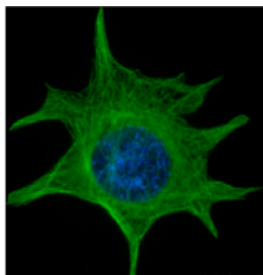
Accessible Curricula

With increasing student diversity it is now likely that within student groups there will be some who have a disability. The application of good practice and making curricula more accessible does not just benefit disabled students but all those in higher education.

The introduction of the Special Educational Needs and Disability Act 2001 (SENDA), part 4 of the Disability and Discrimination Act 1995, means that education is required to be accessible for all. Specifically staff and institutions must make reasonable adjustments to ensure that disabled people are not put at a substantial disadvantage to people who are not disabled in accessing higher education.

In many cases making teaching more accessible can simply be a case of following "good practice". For example:

- Facing the audience when conducting a lecture and not speaking if you turn away to write on a board.

- Ensuring that slides are in an appropriate font size, not cluttered and that there is appropriate contrast between the text colour and background.

- Ensuring handouts are in an appropriate font size and available in several formats. Ideally available in advance of each session.

- Make sure everyone in a lecture, practical group, tutorial group etc can hear you and understands any instructions you give.

- Play videos and DVDs with sub-titles.

Further information:

Our Website contains more information on Disability and Accessible Curricula.
www.bioscience.heacademy.ac.uk/resources/disability/index.aspx

Nine **guides for staff supporting disabled students** and one for disabled students, published by the Geography Discipline Network under the Inclusive Curriculum Project (ICP).
www2.glos.ac.uk/gdn/icp/gdlist.htm

The **TechDis Accessibility Essentials** guides give practical information and advice on making electronic documents and presentations more accessible.
www.techdis.ac.uk/index.php?p=3_20

Doyle, C. and Robson, K. (2002) **Accessible Curricula: Good Practice for All.** Cardiff: UWIC Press. Each section includes pointers and checklists and individual student experiences are presented. Sections 5 and 6 focus on lab work, placements and fieldtrips.
techdis.ac.uk/resources/files/curricula.pdf

Embedding success: **Enhancing the learning experience for disabled students** (2006). Published by the Higher Education Academy draws together the outcomes of a number of projects which aimed to improve the provision for disabled students in higher education.
www.heacademy.ac.uk/assets/York/documents/resources/resourcedatabase/id594_embedding_success.pdf

Other useful resources

BEN portal
The portal is from the American Association for the Advancement of Science. It provides a single access point to resources held by all member organisations. Registration is required to gain free access and it contains over 680 resources.
www.biosciednet.org/portal/

BIODIDAC
A bank of digital images, diagrams, video, and animations that can be used and adapted for teaching Biology. biodidac.bio.uottawa.ca/

Higher Education Academy
The Higher Education Academy's website contains a wide variety of generic teaching and learning resources. The Supporting Learning section contains resources and information grouped into themed areas such as assessment, student support and employability and enterprise. www.heacademy.ac.uk/

MERLOT Multimedia Education Resource for Learning and Online Teaching
Resource of links to online learning materials, annotated with peer reviews, and example student assignments and comments on how individual resources have been employed. Material for use in science and technology teaching account for a subset of the total records. NB: some materials in MERLOT are free whereas others have usage restrictions or costs.
www.merlot.org/merlot/index.htm

SNAS (Supporting New Academic Staff) Database
The SNAS database, aims to provide discipline-specific and generic resources specifically for new academic staff. Resources are reviewed and submitted by Subject Centres and are grouped into themed areas such as; Assessment, Employability and Laboratory work.
www.heacademy.ac.uk/ourwork/professional/snas/snasdatabase

Centre for Bioscience New Lecturer's webpage's.
Further information including lists of bioscience education journals, more detailed bibliographies on specific topics and disciplines and links to more online resources.
www.bioscience.heacademy.ac.uk/network/newlecturer.aspx

Centre for Bioscience Teaching Guides
Orsmond P. (2004) Self- and Peer- Assessment: Guidance on Practice in the Biosciences. Centre for Bioscience, Higher Education Academy
www.bioscience.heacademy.ac.uk/resources/guides/selfpeerassess.aspx

Stefani L. (2006) Effective Use of IT: Guidance on Practice in the Biosciences. Centre for Bioscience, Higher Education Academy.
www.bioscience.heacademy.ac.uk/resources/guides/elearn.aspx

Student Essays
The Centre for Bioscience has run a student essay competition for the last three years. This year's question was "What advice would you give to students starting your course?" Winning and short listed essays are available on our website and they give insight into what students really think. Why not encourage your students to enter next year's competition – a tutorial exercise perhaps. www.bioscience.heacademy.ac.uk/funding/essay/index.aspx