

Bibliography

Education in Biosciences

- *NEW* Billington, H.L., 1997. **Poster presentations and peer assessment: novel forms of evaluation and assessment.** *J.Biol.Educ.*, **31** (3), 218-220. A comparison of student achievement in different assessment exercises shows that diversity of assessment strategies is needed to assess students fairly and avoid discrimination.
- *NEW* Hay, I. & Thomas, S.M., 1999. **Making sense with posters in biological science education.** *J.Biol.Educ.*, **33** (4), 209-214. Briefly reviews the purposes of posters in teaching biology before going on to provide some detailed instruction for students on how to prepare a good, effective poster.
- *NEW* Murphy, T.M., & Cross, V., 2002. **Should students get the instructor's lecture notes?** *J.Biol.Educ.*, **36** (3), 72-75. Pre-circulated notes may improve the clarity of classes and encourage advanced preparation by students – a learning discipline possibly as valuable as organising and reviewing one's own notes.

Practical and Transferable Skills

- *NEW* Baggott, L., Nichol, J., Watson, K. & Poland, R., 1999. **Searching for information the World Wide Web.** *J.Biol.Educ.*, **33** (3), 158-163. How to find quality information with, and avoid the pitfalls of, the World Wide Web.
- *NEW* Barnard, C., Gilbert, F. and McGregor, P. 1993 **Asking questions in biology.** Harlow: Longman. ISBN 0-582-08854-2. An interesting introduction to the problem-solving approach to biological topics.
- *NEW* Birnie, J. & O'Connor, K.M. 1998 **Geography Discipline Network Guide: Practicals and Laboratory Work in Geography.** 64pp. Geography Discipline Network, Cheltenham. This Guide discusses the purpose of practical work, with a review of research on the effectiveness of laboratory teaching in science; the role of postgraduates who support practical work; and alternatives for laboratory work. Transferable skills in practical teaching and learning are considered. Checklists to assist in analysing the purpose of practicals are provided. The Guide provides a set of thirteen case studies of ideas for practical and laboratory sessions in geography. Throughout the Guide the emphasis is on practical advice. For more information, see also: <http://trapdoor.glos.ac.uk/el/philg/gdn/guides/summary.htm>
- *NEW* Clarkeburn, H., Beaumont, E., Downie, R. & Reid, N., 2000. **Teaching biology students transferable skills.** *J.Biol.Educ.*, **34** (3), 133-137. Biology students will require skills and abilities distinct from academic knowledge in their future working life. An educational programme based on interactive teaching units at the University of Glasgow is described to provide an opportunity for the development and practice of these skills.
- *NEW* Nield, E.W., 1987. **Drawing and Understanding Fossils.** Pergamon Press, Oxford. A theoretical and practical guide for students of palaeontology with self-assessment. Gives a grounding in theory in addition to teaching the graphical skills needed to make clear, representative and pleasing drawings of specimens.
- *NEW* Tariq, V.N., 2002. **A decline in numeracy skills among bioscience undergraduates.** *J.Biol.Educ.*, **36** (3), 76-83. This study provides evidence of a decline in basic numeracy skills among first-year bioscience undergraduate students. The results of two types of numeracy test are presented. Reasons for the perceived decline in numeracy skills and the educational implications are discussed.
- *NEW* Thomas, M., Hughes, S.G., Hart, P.M., Schollar, J., Keirle, K. & Griffith, G.W., 2001. **Group project work in biotechnology and its impact on key skills.** *J.Biol.Educ.*, **35** (3), 133-140. Group work approach to the teaching of ethical issues in biotechnology is described and its impact on the acquisition of the key skills of working together, communication, and problem solving, is evaluated. An attempt is made to identify the skill items that are influenced most by the group project work. Gender differences are also highlighted.

Added August 2002

- Jones, A.M., Reed, R. & Weyers, J.D.B., 1998. **Practical Skills in Biology** (2nd edition). Longman, Essex. A text adopted by several universities for practical modules. About to go into its 3rd edition (December 2002).
- Reed, R., Holmes, D. & Weyers, J.D.B. & Jones, A.M., 1998. **Practical Skills in Biomolecular Sciences** (1st edition). Longman, Essex. Another text adopted by

Updated September 2002

several universities for practical modules in cell and molecular subjects. About to go into its 2nd edition.

- Jones, A.M., Duck, R., Reed, R. & Weyers, J.D.B., 2000. ***Practical Skills in Environmental Science***. Pearson Education, Harlow. Another text adopted by several universities for practical modules in Environmental Science and Ecology. This text contains more information about ecological aspects of biology.
- Dean, J.R., Jones, A.M., Holmes, D., Reed, R., Weyers, J.D.B. & Jones, A., 2002. ***Practical Skills in Chemistry***. Pearson Education, Harlow. The latest in the series with many aspects covered of relevance to modern biology as well as chemistry.

Experimental Design and Analysis

- *NEW* Fowler, J., Cohen, L. and Jarvis, P. 1998 (2nd ed) **Practical statistics for field biology**. Chichester: Wiley, ISBN 0-471-98295-4 (*) The 1st edition, Fowler & Cohen, 1992, 1990, is also suitable. An excellent, customer-friendly explanation of the use of statistics for fieldwork data – highly recommended.
- *NEW* Fowler, J. & Cohen, L., 1990. **Practical Statistics for Field Biology**. John Wiley & Sons Ltd, Chichester, England. This book acknowledges the peculiarities of field-based data and its interpretation, and aims to provide biologists with sufficient grounding in statistical principals and methods to enable them to understand research reports in journals, decide on the most appropriate statistical tests for their own problems and finally to analyse and present their findings.
- *NEW* Heath, D., 1995. **An Introduction to Experimental Design and Statistics for Biology**. UCL Press Ltd., University College London. This modern illustrated textbook for biologists provides a clear and authoritative introduction to the key ideas of sampling, experimental design and statistical analysis.
- *NEW* Keith, L.H. Ph.D., 1991. **Environmental Sampling and Analysis – A Practical Guide**. Lewis Publishers, Inc., Michigan. A concise book that covers all the critical aspects of environmental sampling and analysis. The incredible amount of information found in this volume makes it a valuable, comprehensive reference book for chemists, technicians, consultants, lawyers, regulators, engineers, quality control officers, news and information managers, teachers, and students.
- *NEW* McGrew, J.C. Jnr. & Monroe, C.B., 1993. **An Introduction to Statistical Problem Solving in Geography**. Wm. C. Brown Communications Inc., Dubuque. This book is designed to provide a comprehensive and understandable introduction to statistical methods in a practical, problem-solving framework.
- *NEW* Richardson, D.A. & St. John, P.R., 1989. **Methods of Presenting Fieldwork Data**. The Geographical Association. This publication is designed to enable fieldworkers to use their imagination in selecting the most appropriate techniques for displaying the type of data they have collected, and making students confident in the use of these different and often more sophisticated techniques, many of which appear as data response questions in their final examinations.
- *NEW* Watt, T.A., 1993. **Introductory Statistics for Biology Students**. Chapman & Hall, London. This book takes fundamental ideas in statistics and experimental design using the minimum of mathematics and should prove ideal for the many life science students for whom numeracy is not an obvious strength. Examples are taken from a variety of biological disciplines.

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- Quinn, G.P. & Keough, M.J. 2002. **Experimental Design and Data Analysis for Biologists**. Cambridge University Press, Cambridge. "An essential book for any student or researcher in biology needing to design experiments, sampling programs or analyze the resulting data". Data sets, chapter questions and links to software are provided by an associated website. Complex but useful for final year undergraduates and teaching staff.

Updated September 2002

Fieldwork and field trips

- *NEW* Dave, J., 1993. **Fieldwork on derelict land.** *J.Biol.Educ.*, **27** (1), 17-20. An excuse not to dig the garden, an opportunity to explore a disused railway track. Does waste ground have any potential for fieldwork?
- *NEW* Jenkins, A. 1997. **Teaching More Students series: 9. Fieldwork with more students.** 69pp. Oxford Centre for Staff Development, Oxford. Includes: Staff and students' experience of fieldwork; Problems caused by fieldwork with more students; Fieldwork review questionnaire; Strategies for delivering fieldwork with more students overview; Addressing problems of cost; Addressing the problems of staff time; Reducing the burden on fieldwork locations; Assessing fieldwork more economically; Attending to safety and discipline; Defending fieldwork. Another useful document.
- *NEW* Lenon, B.J. & Cleves, P.G., 1983. **Techniques and Fieldwork in Geography.** Unwin Hyman Ltd., London. Techniques and Fieldwork in Geography has been written for geography students taking A-level or similar courses which include a paper on techniques in physical and human geography and/or an element of fieldwork.
- *NEW* Nichols, D (ed.) 1990 **Safety in biological fieldwork - Guidance notes for codes of practice.** 3rd edition. London: Institute of Biology. An important but concise account of this vital topic for the modern fieldworker or staff supervisor
- *NEW* Richardson, D.A. & St.John, P.R., 1989. **Methods of Presenting Fieldwork Data.** The Geographical Association. This publication is designed to enable fieldworkers to use their imagination in selecting the most appropriate techniques for displaying the type of data they have collected, and making students confident in the use of these different and often more sophisticated techniques, many of which appear as data response questions in their final examinations.
- *NEW* Wheater,C., 1989. **A comparison of two formats for terrestrial behavioural ecology field courses.** *J.Biol.Educ.*, **23** (3), 223-229. Two designs of undergraduate terrestrial ecology and behaviour field course are described, and the relative educational benefits of each are considered and the advantages of each type of course are discussed.

Laboratory work

- *NEW* Ackerman, J.D. & Nishizaki, M.T., 1999. **How stiff is a French fry? – Teaching biomechanics to biology students.** *J.Biol.Educ.*, **34** (1), 36-40. Presents a simple technique to measure an important biomechanical feature of tissues, namely tissue stiffness or elastic modulus. Several experimental manipulations are suggested and results are provided for one of these which can easily be conducted in an A-level or early university 3-hour teaching practical (or laboratory).
- *NEW* Edited by Beer, D.F., 1992. **Teaching in Laboratories.** The Institute of Electrical and Electronics Engineers, Inc., New York. This anthology delivers concrete advice from foremost experts on how to communicate more effectively in the workplace. Beer includes discussions of a variety of approaches.
- *NEW* Birnie, J. & O'Connor, K.M. 1998 **Geography Discipline Network Guide: Practicals and Laboratory Work in Geography.** 64pp. Geography Discipline Network, Cheltenham. This Guide discusses the purpose of practical work, with a review of research on the effectiveness of laboratory teaching in science; the role of postgraduates who support practical work; and alternatives for laboratory work. Transferable skills in practical teaching and learning are considered. Checklists to assist in analysing the purpose of practicals are provided. The Guide provides a set of thirteen case studies of ideas for practical and laboratory sessions in geography. Throughout the Guide the emphasis is on practical advice.
For more information, see also:
<http://trapdoor.glos.ac.uk/el/philg/gdn/guides/summary.htm>
- *NEW* Boud, D., Dunn, J. & Hegarty-Hazel, E., 1986. **Teaching in Laboratories.** SRHE & NFER-NELSON, Surrey. A complete guide to the design and organisation of laboratory activities and the conduct of laboratory teaching. An exhaustive up-to-date account and appraisal of current practise, with recommendations for change supported by case studies. A wide literature is examined for adequacy and practicality and an extensive bibliography supplied.
- *NEW* Chart, H. (editor), 1994. **Methods in Practical Laboratory Bacteriology.** CRC Press LLC. ISBN: 0849386926. Hardcover, 176 pages. This book provides detailed technical information to insure that the reader achieves consistent and reliable data. An advance text with some useful undergraduate relevance.
- *NEW* Coyne, G.S., 1997 (second edition). **The Laboratory Companion: A Practical Guide to Materials, Equipment, and Technique.** John Wiley & Sons. ISBN: 0471184225. A practical guide to materials, equipment, and technique. An important resource for students as well as veteran scientists and lab technicians. Provides complete coverage of all commonly used lab equipment.
- *NEW* Gibbs, G., Gregory, R., & Moore, I., 1997. **Teaching More Students series: 7. Labs and Practicals with more students and fewer resources.** 67pp. Oxford Centre for Staff Development, 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.
- *NEW* Nachtigall, W., 1995. **Exploring with the microscope.** Sterling Publishing Company, Inc., New York. This book teaches the general principles behind buying and using a microscope.
- *NEW* Stehli, G., Dr., 1960. **The Microscope and how to use it.** Dover Publications Inc., New York. This book teaches the general principles behind using a microscope properly including preparation of samples.

NEW Turner, M.E., Paradise, N.F. & Johnson, M.L., 1998. **Simulating a research environment in an undergraduate genetics laboratory.** *J.Biol.Educ.*, **32** (2), 92-96. Creating the excitement of scientific discovery in an undergraduate genetics laboratory.

Added August 2002

- Franklin, S., Peat, M., & Lewis, A., 2002. **Traditional versus computer-based dissections in enhanced learning in a tertiary setting: a student perspective.** *J.Biol.Educ.*, **36** (3), 124-129. This paper describes a study investigating both the use and usefulness of laboratory dissections and computer-based dissections, in a tertiary, first-year human biology course. The outcomes reinforce the need to offer a variety of learning experiences that target different styles of learning.

Projects & Project work

- *NEW* Wedgwood, M., 1987. **Tackling Biology Projects**. MacMillan Education Ltd., Houndmills. This book offers "straightforward help and guidance in a style which is uncomplicated and authoritative" while taking a sympathetic and realistic view of the kinds of problems, difficulties and challenges faced by students when doing a practical project in biology.
- *NEW* Seel, D.C., 1989. **Getting started on a research project in field biology: practical guidance for students**. *J.Biol.Educ.*, **23** (3), 232-238. A research project in field biology is an organised piece of study involving an appreciable amount of planning. Certain stages need to be anticipated very early on in order that the work can be completed satisfactorily and pleasurably.
- *NEW* Stefani, L.A.J. & Tariq, V.N., 1996. **Running group practical projects for first-year undergraduate students**. *J.Biol.Educ.*, **30** (1), 36-40. This article describes some of the problems and the many rewards associated with introducing group project work to a large class of first-year undergraduate students.

Ecology

- *NEW* Calver, M.C. & Wooller, R.D., 1998. **A non-destructive laboratory exercise for teaching some principles of predation.** *J.Biol.Educ.*, **33** (1), 45-48. A practical exercise to highlight the relationship between an individual predator's consumption rate (defined as the number of prey eaten), and the density of its prey.
- *NEW* East, D. & Knight, D., 1998. **Sampling soil earthworm populations using household detergent and mustard.** *J.Biol.Educ.*, **32** (3), 201-206. Sampling earthworm populations in soil using detergent or mustard is compared with traditional hand-sorting techniques. The physiological effects of these vermifuges on earthworms are reported.
- *NEW* Fenner, M., 1997. **Evaluation of methods for estimating vegetation cover in a simulated grassland sward.** *J.Biol.Educ.*, **31** (1), 49-54. Estimating vegetation cover is subject to many pitfalls. This laboratory exercise examines the merits of different approaches to a familiar fieldwork problem.
- *NEW* Hauer, F.R. & Lamberti, G.A., 1996. **Methods in Stream Ecology.** Academic Press Ltd., London. This book provides a complete series of field and laboratory protocols in stream ecology that are ideal for teaching or conducting research. It is also a valuable reference for those who are not trained as stream ecologists.
- *NEW* Gilbertson, D.D., Kent, M. & Pyatt, F.B., 1985. **Practical Ecology for Geography and Biology Survey, mapping and data analysis.** Unwin Hyman Ltd, London. This book provides the basis for a project-based course in ecology at the upper end of secondary school and at college and university. It aims to demonstrate the relevance and simple application of carefully selected methods for data collection and statistical analysis in ecology and the critical analysis and interpretation of results.
- *NEW* Openshaw, P.H. & Whittle, S.J., 1993. **Ecological field teaching: how can it be made more effective?** *J.Biol.Educ.*, **27** (1), 58-66. Ecological field trips can be fun but sometimes frightening for both teacher and students. They can be more effective if learning problems are identified and overcome.
- *NEW* Slingsby, D. & Cook, C., 1986. **Practical Ecology.** MacMillan Education Ltd, London. This book gives background ecological theory within the context of practical exercises that illustrate scientific processes, instructions for the application of a range of techniques and equipment from the traditional to computers and the other electronic items. Also details the principles of experimental project work leading from ecological field studies.
- *NEW* Smith, R.L. & Smith, T.M., 2001. **Ecology and Field Biology** (sixth edition). Benjamin Cummings, an imprint of Addison Wesley Longman, Inc. This book aims to present a balanced introduction to ecology – plant and animal, theoretical and applied, physiological and behavioural, population and ecosystem.
- *NEW* Warrington, S., Knaggs, D. & Smith, A., 1996. **Methods for determining species-habitat relationships, illustrated with fieldwork on freshwater macroinvertebrates in an upland catchment.** *J.Biol.Educ.*, **30** (4), 257-264. Species-habitat relationships are a fundamental part of the life history of all organisms, and their study should be encouraged in ecological fieldwork.
- *NEW* Wheeler, C., 1989. **A comparison of two formats for terrestrial behavioural ecology field courses.** *J.Biol.Educ.*, **23** (3), 223-229. Two designs of undergraduate terrestrial ecology and behaviour field course are described, and the relative educational benefits of each are considered and the advantages of each type of course are discussed.

Marine biology

- *NEW* Baker, J.M. & Wolff, W.J. 1987. **Biological surveys of estuaries and coasts**. Cambridge University Press, Cambridge. An introduction to biological survey methods for estuaries and coasts, the aim of this book is to introduce readers to a wide range of techniques (together with their advantages and limitations for achieving particular objectives), and to indicate where further information on particular topics can be found.
- *NEW* Fish, J.D. & Fish, S., 1989. **A Students Guide to the Seashore**. Cambridge University Press, Cambridge. A concise, illustrated guide to both the biology and identification of over 600 common and widespread shore animals and plants.
- *NEW* Haefner, P.A.Jnr., 1996. **Exploring Marine Biology - Laboratory and Field Exercises**. D. C. Heath and Company, Lexington. A manual suitable for all marine biology courses. It can be used both in the one-term introductory course in marine biology typically taken by students who have had an introductory course in the biological sciences, and in introductory courses designed for the non-science major.
- *NEW* Edited by: Holme, N.A. & McIntyre, A.D., 1984. **Methods for the Study of Marine Benthos**. Blackwell Scientific Publications Ltd, Oxford. This handbook is a general introduction to the methods, apparatus, and techniques currently used for studying plants and animals living on the sea bed.
- *NEW* Newell, G.E. & Newell, R.C. 1963 (revised 1973). **Marine Plankton**. Hutchinson Educational Ltd., London. This book provides for students of zoology a concise account of the kind of practical study of plankton they might make at sea or in the laboratory. Methods of plankton collection, sorting and quantitative estimation are discussed.
- *NEW* Parsons, T.R., Maita, Y. & Lalli, C.M., 1984. **A Manual of Chemical and Biological Methods for Seawater Analysis**. Pergamon Press Ltd, Oxford. This Manual is intended to serve as an introduction to the quantitative analysis of sea water. Biological and chemical techniques (which are considered to be amongst those most often used by biological oceanographers) are described in detail. In general, the techniques require a minimum of prior professional training and in addition, methods requiring the use of very expensive equipment have been avoided.

Environmental Biology

- *NEW* Hewitt,G., 1991. **River quality investigations, Part 1: Some diversity and biotic indices.** *J.Biol.Educ.*, **25** (1), 44-52. Various techniques, useful at both undergraduate and sixth-form level, for assessing river water quality are described and evaluated.
- *NEW* Pyatt,F.B. & Storey,D.M., 1999. **Toxicity testing using *Daphnia magna* Straus in student assessments of water pollution.** *J.Biol.Educ.*, **33** (3), 164-170. This report gives a simple procedure, allows groups of students to investigate the toxic effects of potential environmental pollutants in the laboratory, using *Daphnia magna* as a test organism. The procedure introduces students to dose-dependant toxicity.
- *NEW* Trevors,J.T., 1998. **Cellulose decomposition in soil.** *J.Biol.Educ.*, **32** (2), 133-136. This article describes a laboratory technique for studying decomposition of organic matter such as cellulose paper, cotton cloth (calico) and straw in soil.
- *NEW* Watts, S. & Halliwell, L., 1996. ***Essential Environmental Science.*** Routledge, London. A practical guide to the key tools needed for studying across the breadth of the environmental sciences. Presenting a wide cross-disciplinary range of techniques and information within a unique environmental perspective, this is a useful handbook for environmental study and for use in laboratory and field work.

Animal Biology

- *NEW* Abramoff, P. & Thomson, R.G., 1962. **Laboratory Studies in Animal Biology**. W. H. Freeman and Company, USA. A manual designed to acquaint the student with many of the fundamental principles and concepts of living systems through an experimental analysis of the systems.
- *NEW* Barrass, R., 1996. **Locusts for student-centred learning**. *J.Biol.Educ.*, **30** (1), 22-26. A cage of living locusts excites great interest. It is both an inexpensive, ever-changing visual aid and a resource for student-centred learning.
- *NEW* Floyd, D., 1994. **Stick insects**. *J.Biol.Educ.*, **28** (1), 19-22. What projects can pupils do with stick insects? Which varieties are easy to keep in the laboratory?
- *NEW* Foster, R., 1997. **A stroboscopic method to investigate the effect of caffeine on *Daphnia* heart rate**. *J.Biol.Educ.*, **31** (4), 253-255. *Daphnia* provides an easily visible heart which responds rapidly to soluble drugs. Stroboscopic illumination of the animal enables the student to make accurate heart rate counts.
- *NEW* Martin, P. and Bateson, P. 1993 **Measuring behaviour: an introductory guide**. 2nd edition. Cambridge: Cambridge University Press. ISBN: 0-521-44614-7. (£9.95) (*) The 1st edition is also suitable. A useful account of an increasingly popular subject for practical work
- *NEW* Majerus, M.E.N., Kearns, P.W.E., Ireland, H. & Forge, H., 1989. **Ladybirds as teaching aids: 1 Collecting and culturing**. *J.Biol.Educ.*, **23** (2), 85-95. Ladybirds have potential to be useful teaching aids for a range of biological subjects. Methods are described for finding and collecting ladybirds.
- *NEW* Majerus, M.E.N., Kearns, P.W.E., Forge, H. & Burch, L., 1989. **Ladybirds as teaching aids: 2 Potential for practical and project work**. *J.Biol.Educ.*, **23** (3), 187-192. Ladybirds find favour with children as one of the most attractive and popular groups of insects. Because of this they are potentially useful as teaching material. This paper suggests ways in which they may be used as illustrative material in a range of biological fields.
- *NEW* Lee, D.G. & Corbet, S.A., 1989. **Evaluating colonization samplers for freshwater invertebrates**. *J.Biol.Educ.*, **23** (1), 23-31. Compares various colonization samplers in terms of the precision in which they sample the community of macro invertebrates in slow-moving waterways.
- *NEW* Tranter, J.A., 1993. **The giant African land snail, *Achatina fulica*, and other species**. *J.Biol.Educ.*, **27** (2), 108-111. *A. fulica* is easy to keep and breed in the classroom and provides much scope for investigatory work in schools.
- *NEW* Ward-Booth, K. & Reiss, M., 1988. **Artemia Salina: an easily cultured invertebrate ideally suited for ecological studies**. *J.Biol.Educ.*, **22** (4), 247-251. General account of the biology of this important laboratory animal together with advice for rearing cultures for experimental use.
- *NEW* Pyatt, F.B. & Storey, D.M., 1994. **The growth and maintenance of freshwater insects in the laboratory**. *J.Biol.Educ.*, **28** (4), 242-244. This article describes a low- and medium-cost rearing apparatus for freshwater insects. It also includes instructions for their capture and identification, with teaching suggestions for their use in school investigations.

Plant Science

- *NEW* Mulligan, B. & Anderson, M., 1995. **Arabidopsis thaliana: a versatile plant for teaching and research projects in genetics and plant biology.** *J.Biol.Educ.*, **29** (4), 259-269. *Arabidopsis thaliana* is widely employed in plant molecular genetics research and is also a versatile model for teaching practical genetics at all levels. *Arabidopsis* is a useful complement to other plant species, such as the rapid-cycling brassicas, currently employed in science education.
- *NEW* Tomkins, S.P. & Williams, P.H., 1990. **Fast plants for finer science – an introduction to the biology of rapid-cycling *Brassica campestris*** *J.Biol.Educ.*, **24** (4), 239-250. This article explains what fast plants are, how they relate to other brassicas, how they may be obtained for classroom use, and how they may be grown.
- *NEW* Weyers, J.D.B., Hoglund, H. & McEwen, B., 1998. **Teaching botany on the sunny side of the tree: promoting investigative studies of plant ecophysiology through observations and experiments on sun and shade leaves.** *J.Biol.Educ.*, **32** (3), 181-190. Investigations on sun and shade leaves allow students to compare plant growth patterns in different environments and to appreciate plants as slow-motion combatants for light as a resource.