

Instructions to authors

Objectives of the *JBE*

The main objectives of the *Journal of Biological Education* are to:

- comment on the latest policy developments affecting the teaching of biology;
- appraise curriculum developments in biology;
- promulgate results of research into the teaching, learning, and assessment of biology;
- present investigatory, experimental, and novel teaching/learning techniques suitable for use with biology students;
- update educators on the advances in biology relevant to biology syllabuses;
- review resources for biology teaching.

The journal attaches considerable importance to research which is capable of being **applied** to educational practice. Authors should remember that the journal has a wide-ranging and international readership hence all papers should contain a clear description of the settings to which they relate. It is also useful to emphasise the relevance of the paper to other settings within biological education.

The journal seeks to publish three main categories of article relevant to all forms of biology education: Reviews, Research reports and Interactive learning.

Reviews

This category aims to provide a link between research findings and the classroom and to provide teachers with up to date information on key areas. Reviews should give a clear and concise summary of a biological or educational topic. Discussion or theoretical papers may be submitted under this heading.

Full reviews

Should be both timely and relevant to the biological curriculum, and are intended to allow the authors to give a detailed overview of a scientific or educational topic. Authors are encouraged to write the review in a 'reader-friendly' style and to emphasise key ideas by the use of bullet points. The manuscript should comprise:

Abstract

Maximum 200 words and intended to provide a clear overview of the article.

Main article

Maximum 2500 words. In the introductory paragraph, the target audience should be clearly identified. *In the concluding statements, the authors should clearly emphasise the relevance and application of the paper to the relevant educational setting(s).*

References

In the standard format (see later) and limited to a maximum of 15. A majority of the references should be easily accessible to teachers and educators from a range of backgrounds.

Comments and case studies

Short discussions of key points relevant to biological education. Case studies should be supported by preliminary data which is of insufficient breadth to support a full paper but is novel enough to warrant rapid publication. While these may be speculative in nature, the arguments must be clearly focused and their relationship to a given educational setting should be emphasised. These papers should be a maximum of 1000 words with not more than five key references.

Research reports

These may be case studies into any aspect of education practice. Their importance will be introduced against the background of a critical review of the relevant literature. The methods and results will be described along with both conclusions and implications for future research and teaching practice.

Research reports form the main section of the journal's content and should generally not exceed 5000 words.

Full papers

Abstract

Maximum 200 words to provide a clear overview of the article. Should include details of the educational setting, the methods employed, and data obtained.

Introduction

Should provide a clear overview of the area and care should be taken to ensure that the research reported is set in a context of previously published research. Authors should clearly indicate the educational setting in which the investigation was carried out.

Methods

Methods used should be clearly described with care taken to define the subject and control groups, where appropriate. Any practical limitations, if experienced, should be indicated.

Results

Should be clearly described and, where appropriate, supported by the use of relevant statistical tests.

Discussion

Data should be discussed in relation to their educational setting, limitations, and relevance to other settings should be highlighted.

Educational implications

This final section should be limited to 400 words. Authors should use this section to emphasise the educational relevance and application of their research to the appropriate educational context. The use of bullet points is acceptable.

References

Should be limited to those which are directly relevant to the work described. They should not usually exceed 25 in number and should be accessible to a wide readership.

Notes

Notes are intended to be short papers (maximum 2000 words plus three figures or tables) that report novel findings worthy of urgent publication. The layout may be similar to that described for full papers, although the demarcation between sections may not be as clear. References should be limited to 10 or less.

Interactive learning

Short articles of up to 1000 words describing a novel teaching/learning aid that can be related to the curriculum and implemented in a classroom environment are of interest. May also include descriptions of other innovations and developments, such as the use of teaching aids and the implementation of software packages. Emphasis will be on the nature of the practice, a clear description of the implementation procedure, and *an evaluation of its success*. The exercise described should have been trialled within an educational setting.

Such manuscripts should contain no more than five references and require an abstract of no more than 100 words. It should be

noted that where potential authors feel they may have a topic which would be suitable for *JBE*, advice and guidance is freely available from the Editor.

Practical papers

Should clearly describe a laboratory or classroom-based exercise or fieldwork of relevance to biological curriculum. They should be limited to 3000 words and be divided into the following sections:

Abstract

Maximum 200 words, providing a clear overview of the article. Should include details of the target audience, the experiment described, and review the data likely to be obtained.

Introduction

Should serve two functions; it should:

- a) clearly indicate the type of students who have attempted the practical and list the range of curricula to which the paper is applicable;
- b) provide sufficient biological background to ensure that a non-specialist can understand the theory behind the work.

Note: this section should serve to support the practical by setting the work in context — it should not become the main focus of the paper and, where possible, should be limited to no more than 700 words. The authors should clearly indicate the main educational objectives, which the exercise intends to meet, and the assessment criteria intended to test whether these objectives have been met.

Methodology

Should be clearly described with attention being paid to the nomenclature used (see above). The text should allow educators from a range of backgrounds to implement the practice as described. Specialist suppliers should be named using brackets in the text, where possible ensuring that the supplier can be contacted by an international audience e.g. Lysozyme (Sigma). Supplier details should be given in an appendix.

Results

Typical results for the experiment should be described and it is important that the variability that can be observed is indicated by use of the appropriate statistics. Where authors are unsure of the correct statistical tests, guidance can be obtained from the Editor.

Discussion

Authors should briefly discuss the data showing its relevance to the background material covered in the introduction. This section should also include a description of the implementation, problems observed and how they were overcome. *Ideally this section will show some level of educational research into the students' perception of the work, and discuss how effectively the exercise met its educational objectives.* The author is encouraged to suggest a few key questions, which could be used by educators who wish to develop the practical in their own institution.

References

Should be limited to a maximum of 10. It is expected that the references should be accessible to a wide range of educators.

Suppliers

Name, address, and where possible fax number and email address should be given for suppliers mentioned in the paper. Addresses of local suppliers should be avoided where possible.

Editorial organisation and reviewing process

The Editor is appointed by the Institute of Biology and has final responsibility for all editorial decisions. The Editorial Board together with the Editor process **all** manuscripts that are received, and are supported by an Editorial Advisory Board.

Suitable manuscripts will be sent to two referees to ensure that the paper is applicable to the classroom and that the science and/or educational research is sound. The review process is completely anonymous. Reviewers are selected based on their competence in specialised areas of biology and education. If reviewers disagree, or if in the opinion of the Editor the paper has not been sufficiently considered, it will be sent to a member of the Editorial Advisory Board to aid in arbitration. Editorial decisions that result from this process are final.

If the manuscript is returned for revision the author should reply to the specific recommendations in a covering letter stating how each point has been addressed. If any recommendations have been disregarded the reasons should be given. The revised manuscript should be returned to the Production Editor within 90 days, after which it will be considered a new submission and will undergo the full review process.

Submission of manuscripts

Manuscripts should be sent to: **The Production Editor, Journal of Biological Education, Institute of Biology, 20 Queensberry Place, London, SW7 2DZ, UK. Email: jbe@iob.org.** *Electronic submission is acceptable and preferred.*

Sending files

We can accept: floppy, CD-ROM, and Zip discs. *We do accept, and prefer, files by email.*

Formats

We can accept Plain ASCII text (.txt); MS Word documents (.doc); Graphical image files (.gif); Adobe photoshop files (.psd); TIFF files (.tif); JPEG image files (.jpg); MS Excel spreadsheet documents (.xls).

Preferred resolution is 300 DPI. Please note that graphic files derived from websites are not suitable for printing purposes as they are generally only screen resolution.

Paper submission

If submitting your paper by post, please include:

- The original and TWO complete copies of the paper.

In summary

	Reviews	Case studies	Research reports	Notes	Interactive learning	Practicals
Max. article length (words)	2500	1000	5000	2000	1000	3000
Max. abstract length (words)	200	n/a	200	200	100	200
Max. intro length (words)	no limit	no limit	no limit	no limit	no limit	700
Educational Implications (words)	n/a	n/a	400	n/a	n/a	n/a
Max. references	15	5	25	n/a	5	10

Photocopies of figures are only acceptable if they show all the detail necessary to allow critical evaluation of the manuscript;

- A disc containing an electronic version of the manuscript (see notes above);
- Three copies of papers listed as in press or submitted;
- A submittal letter with the original signature of the corresponding author and his/her email, fax, and postal address.

Presentation of manuscripts

Authors should ensure that manuscripts meet the following guidelines:

- All contributions must be in English and as succinct as possible.
- Manuscripts should be printed double-spaced on one side only of A4 paper, with wide margins.
- The paper should be the work solely of the author(s) stated, not been previously published elsewhere, and is not under consideration by another journal.
- If accepted for publication it must not be published elsewhere in the same form without the consent of the Editor.
- If previously published tables or illustrations or more than 200 words of text are to be included, then the copyright holder's permission should be obtained by the author. Copies of any such permission letters must accompany the manuscript.

Layout of cover sheet

The first page will act as a cover sheet and should include:

- A title which clearly describes the manuscript's content;
- The name(s) and affiliation(s) of the author(s) including telephone and fax numbers, and email addresses — the author for correspondence should be clearly indicated;
- A running title of no more than 50 characters (including spaces);
- Up to five key words;
- A brief description (no more than 200 characters) of the article.

The second page should contain only

- The title of the paper;
- A short abstract of no more than 200 words.

General notes

Papers should show the relevance of the results and insights in both their specific setting and in any general setting to which they may also relate. Papers should, where practicable, be written in the *passive tense* with authors showing sensitivity with respect to gender issues. Footnotes are discouraged, and all material should be placed in the main body of the text. If notes are required they should be numbered sequentially and placed at the end of the paper. Appendices may be used if they are essential to the understanding of the manuscript.

Units, symbols, and nomenclature

- the International System of Units (SI) must be used throughout and all symbols defined;
- acronyms and abbreviations should be kept to a minimum and, where used, must be spelt out in full on first usage;
- nomenclature should follow *Biological Nomenclature* available from the Institute of Biology;
- organisms at all levels should be followed by their Latin names in full on the first occurrence (e.g. *Homo sapiens*) and thereafter the genus name may be shortened (*H. sapiens*);
- for chemical nomenclature the rules of the International Union of Pure and Applied Chemistry (IUPAC) should be followed. If desired, the common current name may be included in parentheses after the recommended name.

Tables

Tables should be provided on separate pages, one table per page.

Each table must be numbered and must have a title. All tables must be referred to in the text.

Illustrations

Figures should be numbered clearly and consecutively using Arabic numbers and should be referred to in the text. List figure legends together on a separate sheet.

It is possible for the journal to carry colour pictures, but this should be discussed with the Editor upon submission of the manuscript. Authors are encouraged to provide images for use on the cover. All illustrations will be returned after publication.

Line illustrations

Figures, charts, graphs, and drawings must be of high professional standard and should be large enough to withstand reduction.

Diagrams will normally be reproduced at one quarter or one half A4, depending on the level of detail present. Full-size A4 figures are accepted where these are warranted, e.g. for reproduction in the Interactive learning section for class use.

Drawings, when appropriate, should include an indication of scale. No corrections can be made to illustrations on proofs.

Photographs

These must be clear, good quality black and white slides or prints. A drawing is preferable to a poor quality photograph. Any lettering required should be on a transparent overlay. Where possible, the insertion of a scale on the photograph is preferable to a statement of magnification in the caption. Some high-resolution electronic formats (no less than 300 dots per inch; at a size of not less than 10 cm²) are also acceptable, and should be discussed with the Editor.

References

References in the text should be given as follows: a paper (Wratten and Hodge, 1999); a book (Clegg and Mackean, 1994); and a book chapter (Endler, 1991). Papers with three or more authors should be cited as Brown *et al.*, 1995. When an author has published two or more papers in one year, the references should be distinguished by referring to Brown (1995a) and Brown (1995b), etc. Where more than one reference is given at the same point in the text, they should be listed chronologically.

References at the end of the paper should be listed alphabetically in the following format:

Clegg C L and Mackean D G (1994) *Advanced biology: principles and applications*. London, UK: John Murray.

Endler J A (1991) Interactions between predators and prey. In *Behavioural ecology*, eds Krebs J R and Davies N B pp. 169 – 196. Oxford, UK: Blackwells.

Wratten S D and Hodge S (1999) The use and value of prior knowledge assessments in ecology curriculum design. *Journal of Biological Education*, **33**, 201 – 203.

The author is responsible for the accuracy of references.

The ampersand symbol should not be used.

There should be a separate section for references to electronic/web based resources that includes web name, address, and date of access.

References to sources of materials, visual aids, etc.

All source references should be checked personally by the author to ensure that they are up to date at the time of going to press. Full addresses, including postal codes, must be given.

Websites

Authors are encouraged, where possible, to include up to three web based links which may be of use to the reader. These do not have to be referred to in the main body of text, but are for further reading only.

Offprints

Corresponding authors of main articles (papers greater than two pages in length) will receive 25 free offprints of their contribution. Additional offprints can be ordered when returning page proofs. All authors of all contributions will receive one complimentary copy of the journal.

Copyright

When papers are accepted, authors are asked to assign copyright, in print and electronic form, to the Institute of Biology. The Institute is then responsible for dealing with requests for reprinting or copying, and for protecting authors' rights.

Authors must obtain *written* permission to use in their articles any material which has been published elsewhere, and must include on their manuscripts any credits requested to the source. Photocopies of letters granting permission should be included with submitted manuscripts.

Sources of further information

- Association for Science Education (1995) *Signs, symbols, and systematics*. Hatfield, Herts, UK: Association for Science Education.
- Baron D N ed. (1994) *Units, symbols and abbreviations: a guide for biological and medical editors and authors*. 5th edn. London, UK: The Royal Society of Medicine.

- Barras R (1990) Scientific writing for publication: a guide for beginners. *Journal of Biological Education*, **24**, 177 – 181.
- BS 5555 (1993) *Specification for SI units and recommendations for the use of their multiples and of certain other units*. London, UK: British Standards Institution.
- BS 5775 (1993) *Specification for quantities, units and symbols. General principles. Part O*. London, UK: British Standards Institution.
- Cadogan A (2000) *Biological nomenclature: recommendations on terms, units, and symbols*. Third edn. London, UK: IOB.
- Council of Biology Editors (1983) *CBE style manual: a guide for authors, editors, and publishers in the biological sciences*. 5th edn. Bethesda, Maryland, USA: Council of Biology Editors.
- Day R A (1994) *How to write and publish a scientific paper*. 4th edn. Phoenix, Arizona, USA: Oryx Press.
- OED (1981) *The Oxford dictionary for writers and editors*. 12th edn. Oxford, UK: Oxford University Press.

Queries

If you have any queries please contact the Production Editor at the Institute of Biology (Tel. +44 (0) 20 7581 8333 ext 251; Email: jbe@iob.org).