

Instructions for authors

Objectives of the Journal

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 investigative, 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. *JBE* is published in English and all manuscripts must be submitted in English.

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

JBE will accept a paper only if it is scientifically sound and makes a clear contribution to biological education.

The article must be clearly written providing:

- i) background to the work, both with respect to the biology and pedagogy
- ii) clear and relevant methodology and results
- iii) discussion based on the results, with data clearly supporting any claims made
- iv) a description of how the results of the work can be put into practical action in an educational setting.

Submission of articles

Papers submitted to *JBE* should be a maximum of 5,000 words (including tables and references) in length. Only in exceptional circumstances will articles of greater length be accepted. Articles for Practical and Interactive Learning categories will normally be considerably shorter.

References in particular should be limited to those essential to support the argument advanced in the paper and should not fulfil the role of 'further reading'.

The contents of each issue of *JBE* are divided into a number of categories: Reviews, Educational Research reports, Case Studies, Interactive Learning and Practicals.

The cover sheet

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

- i) a title which clearly describes the manuscript's content
- ii) 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
- iii) a running title of no more than 50 characters (including spaces)
- iv) up to five key words.

Article categories

Reviews

This category aims to provide a link between research findings and their application to the teaching situation. They provide teachers with up to date information on key areas. The manuscript should comprise:

Abstract: This should provide a clear overview of the article and its conclusions (maximum 200 words).

Main article: 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.

Research reports

These may cover any aspect of biological 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 not exceed 5000 words.

Abstract: To provide a clear overview of the article. Should include details of the educational setting, the methods employed, and data obtained, as well as the main findings (maximum 200 words).

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: The 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 and their limitations should be noted. The relevance of the results to other settings should be highlighted.

Educational implications: Authors should use this section to emphasise the educational relevance and application of their research to the appropriate educational context (maximum of 400 words).

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.

Case studies

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 2500 words.

Interactive learning

These are shorter articles of up to 3000 words, describing a novel teaching/learning aid or method that can be related to the curriculum and implemented in a classroom environment. They 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.

Practical papers

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

Abstract: This should provide a clear overview of the article. It should include details of the target audience, the experiment described, and review the data likely to be obtained (maximum 200 words).

Introduction: This serves two functions:

- clearly indicating the type of students who have attempted the practical and listing the range of curricula to which the paper is applicable
- providing sufficient biological background to ensure that a nonspecialist can understand the theory behind

the work.

This section should serve to support the practical by setting the work in context – it should not be 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: This should be clearly described. 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: These should be limited to a maximum of 10. It is expected that the references would 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 Society of Biology and has final responsibility for all editorial decisions. The Editorial Board together with the Editor process the manuscripts that are received, and are supported by an Editorial Advisory Board.

Once the editor has made an initial assessment of an article, suitable manuscripts will normally be sent to two referees to ensure that the paper is applicable to the educational setting 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 the manuscript is returned for revision the author should reply to the specific recommendations in a cover-

ing 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 Features Editor within 90 days, after which it will be considered a new submission and will undergo the full review process again.

Sending manuscripts

We prefer files by email in MS Word format. We can also accept CD-ROM.

Illustrative material should be supplied in separate files, in high resolution JPEGs (.jpg) or TIFFs (.tif). Graphs and charts can also be sent as MS Excel files. Graphical images should have a resolution of *at least 300dpi at 10cm x 10cm size*. Note that graphic files derived from websites are not suitable for printing purposes as they are generally only screen resolution.

Irreplaceable or valuable artwork must not be sent to the Journal without first arranging it expressly with a member of the editorial staff. The Journal and the Society of Biology can take no responsibility for any unsolicited materials.

Manuscripts should be sent to: The Features Editor, Journal of Biological Education, Society of Biology, 9 Red Lion Court, London EC4A 3EF, UK.

Electronic submission is preferred. Email: jbe@societyofbiology.org.

Copyright and related issues

- The paper should be the work solely of the author(s) stated
- The paper must not have been previously published elsewhere, and must not be 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 accepted for publication, the author(s) will be required to assign copyright to the Society of Biology. Copyright applies to the form of words, not the ideas, so this requirement does not prevent the author from writing different articles on the same subject for other journals in the future. The Society is then responsible for dealing with requests for reprinting or copying, and for protecting authors' rights.
- If authors wish to reproduce an article after it has appeared in *JBE*, permission must be requested from the editorial office, as the copyright holder, first.
- If previously published tables or illustrations, or more than 200 words of text from another work are to be included, then the copyright holder's permission must be obtained by the author. Copies of any such permission letters must accompany the manuscript. N.B. obtaining these permissions is the responsibility of the author(s), not of the Journal.

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. Given the interna-

tional audience of *JBE*, authors should give consideration to the relevance of their results beyond their own national setting.

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*, published by, and available from, the Society 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, at the end of the document. 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 at the end of the document.

Figures, charts, graphs, and drawings must be of high professional standard and should be large enough to undergo reduction in size. 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 and reproducible in colour or black and white. A drawing is preferable to a poor quality photograph. Where possible, the insertion of a scale on the photograph is preferable to a statement of magnification in the caption. Figures and illustrations should be produced to a resolution of *at least 300dpi at a size of 10cm x 10cm*.

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(4) 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.

Offprints

Corresponding authors of main articles (papers greater than two pages in length) will receive 25 free offprints of their contribution, plus a pdf of their article. All authors will receive one complimentary copy of the Journal.

Sources of 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.
- Barrass 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*. 3rd ed. London, UK: Institute of Biology.
- 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 ed. Phoenix, Arizona, USA: Oryx Press.
- OED (1981) *The Oxford dictionary for writers and editors*. 12th ed. Oxford, UK: Oxford University Press.

Further information

These Instructions to Authors cannot cover every eventuality. Please direct any further questions to the Features Editor at the Society of Biology.
Email: jbe@societyofbiology.org