EASE Guidelines for Authors and Translators of Scientific Articles to be Published in English

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European Association of Science Editors

EASE

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EASE Guidelines for Authors and Translators of Scientific Articles to be Published in English

To make international scientific communication more efficient, research articles and other scientific publications should be COMPLETE, CONCISE, and CLEAR. These generalized guidelines are intended to help authors, translators, and editors to achieve this aim.

First of all:

- Do not begin drafting the whole paper until you are sure that your findings are reasonably firm and complete (O'Connor 1991), so that you can draw **sensible and reliable conclusions**.
- Before you start writing, preferably **choose the journal** to which you will submit your manuscript. Make sure that the journal's readership corresponds to your own target audience. Get a copy of the journal's Instructions to Authors and plan the article to fit the journal's preferred format in terms of overall length, number of figures required/allowed, etc.

Manuscripts should be COMPLETE, i.e. no necessary information should be missing. Remember that **information is interpreted more easily if it is placed where readers expect to find it** (Gopen & Swan 1990). For example, the following information must be included in experimental research articles.

- **Title**: should be unambiguous, understandable to specialists in other fields, and must reflect the content of the article. Be specific, not general or vague (O'Connor 1991). If relevant, mention in the title the study period and location, the international scientific name of the studied organism or the experimental design (e.g. case study or randomized controlled trial). Information given in the title does not need to be repeated in the abstract (as they are always published jointly), although overlap is unavoidable.
- **List of authors**, i.e. all people who contributed substantially to study planning, data collection or interpretation of results **and** wrote or critically revised the manuscript **and** approved its final version (ICMJE 2008). Names of authors must be supplemented with their **affiliations** (during the study) and the **present address** of an author for correspondence. E-mail addresses of all authors should be provided, so that they could easily approve the final version of the manuscript.
- **Abstract**: briefly explain why you conducted the study (BACKGROUND), what question(s) you answer (OBJECTIVES), how you performed the study (METHODS), what you found (RESULTS: major data, relationships), and your interpretation and main consequences of your findings (CONCLUSIONS). The abstract must **reflect the content** of the article, including all keywords, as for most readers it will be the major source of information about your study. In a **research report,** the abstract should be **informative**, including actual results. Only in **reviews**, meta-analyses, and other wide-scope articles, should the abstract be **indicative**, i.e. listing the major topics discussed but not giving outcomes (CSE 2006). Do not refer in the abstract to tables or figures, as abstracts are also published separately. References to the literature are also not allowed unless they are absolutely necessary (but then you need to provide detailed information in brackets: author, title, year, etc.). Make sure that all the information given in the abstract also appears in the main body of the article. (*See Appendix: Abstracts*)
- **List of additional keywords** (if allowed by the editors): include all relevant scientific terms that are absent from the title and abstract. Keep the keywords specific. Add more general terms if your study has interdisciplinary significance (O'Connor 1991). In medical texts, use vocabulary found in the MeSH Browser.
- **List of abbreviations** (if required by the editors): define all abbreviations used in the article, except those obvious to non-specialists.
- **Introduction**: explain why it was necessary to carry out the study and the specific question(s) you answer. Start from more general issues and gradually focus on your research question(s).
- **Methods**: describe in detail how the study was carried out (e.g. study area, data collection, criteria, origin of analysed material, sample size, number of measurements, age and sex of participants, equipment, data analysis, statistical tests, and software used). All factors that could have affected the results need to be considered. If you cite a method described in a non-English or inaccessible publication, explain it in detail in your manuscript. Make sure that you comply with the ethical standards in respect of patient rights, animal testing, environmental protection, etc.
- Results: present the new results of your study (published data should not be included in this section). All tables and figures must be mentioned in the main body of the article, in the order in which they appear. Make sure that the statistical analysis is appropriate (Siegfried 2010). Do not fabricate or distort any data, and do not exclude any important data; similarly, do not manipulate images to make a false impression on readers. Such data manipulations may constitute scientific fraud (see COPE flowcharts).
- **Discussion**: answer your research questions (stated at the end of the introduction) and compare your new results with published data, as objectively as possible. Discuss their limitations and highlight your main findings. At the end of Discussion or in a separate section, emphasize your major conclusions and the practical significance of your study.
- **Acknowledgements:** mention all people who

contributed substantially to the study but cannot be regarded as co-authors, and acknowledge all sources of funding as in the recommended form: "This work was supported by the Medical Research Council [grant number xxxx]". If no specific funding was provided, use the following sentence: "This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors." (RIN 2008). If relevant, disclose any other conflicts of interest, e.g. financial or personal links with the manufacturer or with an organization that has an interest in the submitted manuscript (Goozner et al. 2009). If you reproduce previously published materials (e.g. figures), ask the copyright owners for permission and mention them in the captions or in Acknowledgements. If you were helped by a language professional (e.g. author's editor or translator), a statistician, data collectors, etc., you should acknowledge them for the sake of transparency (ICMJE 2008, Graf et al. 2009), but explain that they are not responsible for the final version of the article.

- **References:** make sure that you have provided sources for all important information extracted from other publications. In the list of references, include all data necessary to find them in a library or in the Internet. For non-English publications, give the **original title** (transliterated according to English rules if necessary), followed by its translation into English in square brackets (CSE 2006). Avoid citing inaccessible data. Do not include unpublished data in the list of references – if you must mention them, describe their source in the main body of the article, and obtain permission from the producer of the data to cite them.
- A **different article structure** may be more suitable for theoretical publications, review articles, case studies, etc.
- Some publications include a **summary** in another language, which is very useful in many fields of research.
- Remember to comply with the journal's **instructions to authors** in respect of abstract length, style of references, etc.

Write CONCISELY to save the time of referees and readers.

- **Do not include information that is not relevant to your research question(s)** stated in the introduction. The **number of cited works should not be excessive** – do not give many similar examples.
- **Do not copy** substantial parts of your previous publications and do not submit the same manuscript to more than one journal at a time. Otherwise, you may be responsible for **redundant publication** (see COPE flowcharts). This does not apply to preliminary publications, such as conference abstracts (O'Connor 1991). Moreover, **secondary publications** are acceptable if intended for a completely different group of readers (e.g. in another language or for specialists and the general public) and you have received approval from the editors of both journals (ICMJE 2008).
- Information given in one section preferably **should not be repeated** in other sections. Obvious exceptions include the abstract, the figure legends and the concluding paragraph.
- Consider whether all tables and figures are necessary. Data presented in tables should not be repeated in figures (or vice versa). Long lists of data should not be repeated in the text.
- Captions to tables and figures must be **informative but not very long**. If similar data are presented in several tables or several figures, then the format of their captions should also be similar.
- Preferably **delete obvious statements** (e.g. "Forests are very important ecosystems.") and other redundant fragments (e.g. "It is well known that…").
- If a **long scientific term** is frequently repeated, define its abbreviation at first use in the main body of the article, and later apply it consistently.
- Express your doubts if necessary but **avoid excessive hedging** (e.g. write "are potential" rather than "may possibly be potential"). **Do not overgeneralize** your conclusions.
- Unless required otherwise by the editors, **use numerals for all numbers**, i.e. also for one-digit whole numbers, **except for zero, one** (if without units), **and other cases where misunderstanding is possible**, e.g. at the beginning of a sentence or before abbreviations containing numbers (CSE 2006).

Write CLEARLY to facilitate understanding – make the text readable.

Scientific content

- **Clearly distinguish your original data and ideas** from those of other people and from your earlier publications – provide citations whenever relevant. Otherwise you could commit **plagiarism** (see COPE flowcharts) or self-plagiarism.
- Check that you are using **proper English scientific terms**, preferably on the basis of texts written by native English speakers. Literal translations are often wrong (e.g. so-called "false friends" or non-existent words invented by translators). If in doubt, you can search for a word or phrase in Wikipedia, for example; then compare the results in your native language and in English, to see if the meaning of putative equivalents is truly the same.
- If a word is used mostly in translations and only rarely in English-speaking countries, consider replacing it with a commonly known English term with a similar meaning (e.g. *plant community* instead of *phytocoenosis*). If a scientific term has no synonym in English, then define it precisely and suggest an acceptable English translation.
- **Define every uncommon or ambiguous scientific term** at first use. You can list its synonyms, if there are any (to aid in searching), but later employ only one of them consistently (to prevent confusion). Formal nomenclature established by scientific organizations

should be preferred.

- **Avoid unclear statements**, which require the reader to guess what you meant. (*See Appendix: Ambiguity*)
- When reporting percentages, make clear **what you regard as 100%**. When writing about correlations, relationships, etc., make clear which values you are comparing with which.
- **Système International (SI) units and Celsius degrees** are generally preferred. If necessary, litre should be abbreviated as L, to avoid confusion with the number 1.
- Unlike many other languages, English has a **decimal point** (not comma). In numbers exceeding 4 digits to the right or left of the decimal point, use **thin spaces** (not commas) between groups of 3 digits in either direction from the decimal point (CSE 2006).
- To denote centuries, months, etc., **do not use capital Roman numerals**, as they are rare in English. Preferably denote months as whole words or their first 3 letters.
- If lesser known **geographic names** are translated, the original name should also be mentioned, e.g. "in the Kampinos Forest (Puszcza Kampinoska)". Some additional information about location, climate, etc., may also be useful for readers.
- Remember that the text will be **read mainly by foreigners**, who may be unaware of the specific conditions, classifications or concepts that are widely known in your country; therefore, addition of some explanations may be necessary (Ufnalska 2008). For example, the common weed *Erigeron annuus* is called *Stenactis annua* in some countries, so in English texts the internationally approved name should be used, while its synonym(s) should be added in brackets.

Text structure

- **Sentences generally should not be very long and their structure should be relatively simple**, with the subject located close to its verb (Gopen & Swan 1990). For example, avoid abstract nouns and write "X was measured…" instead of "Measurements of X were carried out…". (*See Appendix: Simplicity*) Do not overuse passive constructions. When translating, modify sentence structure if necessary to convey the message correctly or more clearly (Burrough-Boenisch 2003).
- **The text should be cohesive, logically organized,** and thus easy to follow. (*See Appendix: Cohesion*)
- Each paragraph preferably should start with a topic sentence, and the next sentences fully develop the topic.
- In contrast to some other languages, English allows parallel constructions, as they facilitate understanding. For example, when comparing similar data, you can write "It was high in A, medium in B, and low in C", rather than "It was high in A, medium for B, and low in the case of C".
- **Make figures and tables easily understandable** without reference to the main body of the article. Omit data that are not informative (e.g. delete a column if it contains the same values in all rows – you can write about it in a footnote instead). Apply abbreviations only if necessary for consistency or if there is not enough room for whole words. In captions or footnotes, define all abbreviations and symbols that are not obvious (e.g. error bars may denote standard deviation, standard error or confidence intervals). **Remember to use decimal points** (not decimal commas) and **provide axis labels and units** wherever needed.
- Consider using **text-tables** when presenting a small set of data (Kozak 2009).
- In long lists (of abbreviations, etc.), preferably separate individual items by **semicolons (;)**, which are intermediate between commas and full stops.

Language matters

- Wherever scientific terms are not necessary, preferably use **commonly known words**. However, avoid colloquial and idiomatic expressions, as well as phrasal verbs, (e.g. *find out*, *pay off*), which are often difficult to understand by non-native speakers of English (Geercken 2006).
- **Define abbreviations** when they first appear in the main body of the article (if they may be unclear to readers). **Do not use too many different abbreviations**, as the text would be hard to understand. Do not abbreviate terms that are used only rarely in your manuscript. **Avoid abbreviations in the abstract**.
- In general, use the **past tense** when describing how you performed your study and what you found or what other researchers did. Preferably use the **present tense** in general statements and interpretations (e.g. statistical significance, conclusions) or when writing about the content of your article, especially tables and figures (Day & Gastel 2006).
- **Do not write about yourself "the author(s)"**, as this is ambiguous. Instead, write "we" or "I" if necessary, or use expressions like "in this study", "our results" or "in our opinion". Note that you should write "this study" only if you mean your new results. If you mean a publication mentioned in a previous sentence, write "that study". If you mean authors of a cited publication, write "those authors".
- Remember that in scientific texts the word "**which**" should be used in non-defining clauses, while "**that**" in defining clauses (i.e. meaning "only those that").
- When using **equivocal words**, make sure that their meaning is obvious from the text context. Check if all **verbs agree in number with their subjects** and if the **references for all pronouns are clear** (this is crucial in translated texts). Note that some nouns have **irregular plurals.** (*See Appendix: Plurals*)
- Read the text aloud to check punctuation. All **intonation breaks** necessary for proper understanding should be denoted with commas or other punctuation marks (e.g. note the difference between "no more data are needed" and "no, more data are needed").
- Be **consistent in spelling**. Follow either British or American rules for spelling and date notation (e.g. "21

Sep 2009" in British, or "Sep 21, 2009" in American English; *see Appendix: Spelling*). Check whether the target journal uses American or British spelling, and then use that setting on your word and grammar check.

- Ask a thoughtful colleague to read the whole text, in order to see if there are any ambiguous fragments.

CONTRIBUTORS TO THE GUIDELINES (in chronological order): Sylwia Ufnalska, Paola De Castro, Liz Wager, Carol Norris, James Hartley, Françoise Salager-Meyer, Marcin Kozak, Ed Hull, Mary Ellen Kerans, Angela Turner, Will Hughes, Peter Hovenkamp, Thomas Babor, Eric Lichtfouse, Richard Hurley, Mercè Piqueras, Maria Persson, Elisabetta Poltonieri, Suzanne Lapstun, Mare-Anne Laane, David Vaux, Arjan Polderman, Ana Marusic, Elisabeth Heseltine, Joy Burrough-Boenisch

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Appendix: Abstracts

Key elements of abstracts

Researchers are quite often in a "box" of technical details – the "important" things they focus on day in and day out. As a result, they frequently lose sight of four items essential for any readable, credible and relevant IMRaD article: the point of the research, the research question, its answer, and the consequences of the study.

To help researchers to get out of the box, I ask them to include six key elements in their article and in their abstract. I describe briefly the elements below and illustrate them with a fictitious abstract.

Key element 1 (BACKGROUND): the point of the research – why should we care about the study? This is usually a statement of the BIG problem that the research helps to solve and the strategy for helping to solve it. It prepares the reader to understand the specific research question.

Key element 2 (OBJECTIVES): the specific research question – the basis of credible science. To be clear, complete and concise, research questions are stated in terms of relationships between the variables that were investigated. Such specific research questions tie the story together – they focus on credible science.

Key element 3 (METHODS): a description of the methods used to collect data and determine the relationships between the variables.

Key element 4 (RESULTS): the major findings – not only data, but the RELATIONSHIPS found that lead to the answer. These are historical facts and, therefore, reported in past tense.

Key element 5 (CONCLUSIONS): the answers to the research questions – the authors' INTERPRETATION of the factual findings. An answer to a research question is in the present tense - it reports the authors' belief of how the world IS. Of course, in a pilot study such as the example below, the authors cannot yet present definitive answers, which they indicate by using the words "suggest" and "may".

Key element 6 (final CONCLUSIONS): the consequences of the answers – the value of the work. This element relates directly back to the big problem: how the study helps to solve the problem, and it also points to the next step in research.

To save words in an abstract, we can combine several of the elements in a sentence. Here is a fictitious example. I've indicated the beginning of each key element with [.].

Predicting malaria epidemics in Ethiopia

Abstract

[1] Most deaths from malaria could be prevented if malaria epidemics could be predicted in local areas, allowing medical facilities to be mobilized early. Epidemics are known to be related to meteorological factors, but their correlations with subsequent malaria epidemics have never been determined. [2, 3] In a retrospective study, we collected meteorological and epidemic data for 10 local areas in Ethiopia, covering the years 1963–2006. Using Poisson regression, we found that [4, 5] factors AAA, BBB, and CCC correlated significantly ($P < 0.05$) with subsequent epidemics in all 10 areas, and our model has a predictive power of about 30%. [6] We conclude that meteorological factors can be used to predict malaria epidemics. The predictive power of our model needs to be improved, and it needs to be validated in other areas. (126 words)

This understandable and concise abstract forms the "skeleton" for the entire article. A final comment: This example is based on an actual research project and, at first, the author was in a "box" full of the mathematics, statistics, and computer algorithms of his predicting model. This was reflected in his first version of the abstract, where the word "malaria" never appeared.

Written by Ed Hull, edhull@home.nl
(for more information, see Bless and Hull 2008)

Appendix: Ambiguity

Empty words and sentences

Many English words are empty – they do not add information but require the reader to fill in information or context to be understood. The reader is forced to supply his or her own interpretation, which could be different from what you, the writer, mean.

Empty words seem to give information and uncritical readers do not notice them – that is why they work so well for marketing texts. However, empty words do not belong in articles reporting scientific research. Empty words require the reader to supply the meaning – very dangerous. Concise and clear communication requires words that convey specific meaning.

Examples

It is important that patients take their medicine.

- Note that to a physician the meaning is probably entirely different than to the sales manager of a pharmaceutical company. "Important" is one of our best-loved, but empty, words – it fits every situation.

The patient was treated for XXX.

- "Treated" is empty; we do not know what was done. One reader could assume that the patient was given a certain medicine, while another reader could assume that the patient was given a different medicine. Perhaps the patient was operated on, or sent to Switzerland for a rest cure.

The patient reacted well to the medicine.

- "Reacted well" gives us a positive piece of information, but otherwise it is empty; we do not know how the patient reacted.

We do high-quality research.

- "Quality" is empty. "Cost-effective" or "meets XXX guidelines" would be more specific.

The patient's blood pressure is low.

- We interpret "high/low blood pressure" to mean "higher/lower than normal", but we, the readers, have to supply that reference standard. A more concise statement is: *The patient's blood pressure is 60/45.*

Empty words and phrases not only require the reader to supply the meaning, they also contribute to a wordy blah-blah text. In scientific articles they destroy credibility. Here are some examples.

It has been found that the secondary effects of this drug include…

- Better: *The secondary effects of this drug include…(ref.).* Or, if these are your new results: *Our results show that the secondary effects of this drug include…*

We performed a retrospective evaluation study on XXX.

- "Performed a study" is a much overused and rather empty phrase. Better: *We retrospectively evaluated XXX.*

More examples that require the reader to supply information if it is not evident from the context:

- *quality*
- *good/bad*
- *high/low*
- *large/small*
- *long/short*
- *proper/properly* (e.g. "…a proper question on the questionnaire…")
- *As soon as possible…*

Written by Ed Hull, edhull@home.nl

Appendix: Cohesion

Cohesion – the glue

The word "cohesion" means "unity", "consistency", and "solidity". Building cohesion into your text makes life easier for your readers – they will be much more likely to read the text. Cohesion "glues" your text together, focusing the readers' attention on your main message and thereby adding credibility to your work.

Think of your text as a motorcycle chain made up of separate links, where each sentence is one link. A pile of unconnected links is worthless – it will never drive your motorcycle. Similarly, a pile of unconnected sentences is worthless – it will never drive your message home.

To build a cohesive text, you have to connect your sentences together to make longer segments we call paragraphs. A cohesive paragraph clearly focuses on its topic. You then need to connect each paragraph with the previous paragraph, thereby linking the paragraph topics. Linking paragraphs results in building cohesive sections of your article, where each section focuses on its main topic. Then, link the sections to each other and, finally, connect the end of your article to the beginning, closing the loop – now the chain will drive our motorcycle. Let's look at linking techniques.

Basic guidelines for building a cohesive story:

1. Link each sentence to the previous sentence.
2. Link each paragraph to the previous paragraph.
3. Link each section to the previous section.
4. Link the end to the beginning.

Linking techniques

Whether you want to link sentences, paragraphs, sections or the beginning to the end, use two basic linking techniques:

- Use linking words and phrases, such as: *however, although, those, since then...*
  An example: *Our research results conflict with those of Smith and Jones. To resolve those differences we measured ...*
- Repeat key words and phrases – do not use synonyms. In scientific writing, repetition sharpens the focus. Repetition especially helps the reader to connect ideas that are physically separated in your text. For example: *Other investigators have shown that microbial activity can cause immobilization of labial soil phosphorus. Our results suggest that, indeed, microbial activity immobilizes the labial soil phosphorus.*

The example below illustrates how to link your answer to your research question, thus linking the Discussion with the Introduction.

In the Introduction, the research hypothesis is stated. For example: *The decremental theory of aging led us to hypothesize that older workers in "speed" jobs perform less well and have have more absences and more accidents than other workers have.*

In the Discussion, the answer is linked to the hypothesis: *Our findings do not support the hypothesis that older workers in speed jobs perform less well and have more absences and more accidents than other workers have. The older workers generally earned more, were absent less often, and had fewer accidents than younger workers had. Furthermore, we found no significant difference between...*

Written by Ed Hull, edhull@home.nl

Appendix: Plurals

Examples of irregular plural nouns deriving from Latin or Greek

Singular	Plural	Examples
-a	***-ae*** rarely ***-ata***	*alga – algae*, *larva – larvae* *stoma – stomata*
-ex	***-ices***	*index – indices*, *apex – apices*
-ies	***-ies***	*species, series, facies*
-is	***-es***	*axis – axes*, *hypothesis – hypotheses*
-ix	***-ices***	*appendix – appendices, matrix – matrices*
-on	***-a***	*phenomenon – phenomena*, *criterion – criteria*
-um	***-a***	*datum – data*, *bacterium – bacteria*
-us	***-i*** rarely ***-uses*** or ***-era***	*locus – loci*, *fungus – fungi* (or *funguses*) *sinus – sinuses* *genus – genera*

It must be remembered that some nouns used in everyday English also have irregular plural forms (e.g. *woman – women*, *foot – feet*, *tooth – teeth*, *mouse – mice*, *leaf – leaves*, *life – lives*, *tomato – tomatoes*) or have no plural form (e.g. *equipment*, *information*, *news*). For more examples, see CSE (2006). If in doubt, consult a dictionary.

Compiled by Sylwia Ufnalska

Appendix: Simplicity

Examples of expressions that can be simplified or deleted (∅)

Long or (sometimes) wrong	Better choice (often)
accounted for by the fact that	*because*
as can be seen from Figure 1, substance Z reduces twitching	*substance Z reduces twitching (Fig. 1)*
at the present moment	*now*
bright yellow in colour	*bright yellow*
conducted inoculation experiments on	*inoculated*
considerable amount of	*much*
despite the fact that	*although*
due to the fact that	*because*
for the reason that	*because*
if conditions are such that	*if*
in a considerable number of cases	*often*
in view of the fact that	*because*
it is of interest to note that	∅
it may, however, be noted that	*but*
large numbers of	*many*
lazy in character	*lazy*
methodology	*methods*
owing to the fact that	*because*
oval in shape	*oval*
prior to	*before*
taken into consideration	*considered*
terminate	*end*
the test in question	*this test*
there can be little doubt that this is	*this is probably*
to an extent equal to that of X	*as much as X*
utilize	*use*
whether or not	*whether*

Based on O'Connor (1991)

Appendix: Spelling

Examples of differences between British and American spelling

British English	American English
-ae- e.g. *aetiology*, *anaemia*, *haematology*	***-e-*** e.g. *etiology*, *anemia*, *hematology*
-ce in nouns, ***-se*** in verbs e.g. *defence*, *licence/license*, *practice/practise*	***-se*** in nouns and verbs e.g. *defense*, *license* (but *practice* as both noun and verb)
-ise or ***-ize**** e.g. *organise/organize*	***-ize*** e.g. *organize*
-isation or ***-ization**** e.g. *organisation/organization*	***-ization*** e.g. *organization*
-lled, ***-lling***, ***-llor***, etc. e.g. *labelled*, *travelling*, *councillor* (but *fulfil*, *skilful*)	***-led***, ***-ling***, ***-lor***, etc. e.g. *labeled*, *traveling*, *councilor* (but *fulfill*, *skillful*)
-oe- e.g. *diarrhoea*, *oedema, oestrogen*	***-e-*** e.g. *diarrhea*, *edema, estrogen*
-ogue e.g. *analogue*, *catalogue*	***-og*** or ***-ogue*** e.g. *analog/analogue*, *catalog/catalogue*
-our e.g. *colour*, *behaviour*, *favour*	***-or*** e.g. *color*, *behavior*, *favor*
-re e.g. *centre*, *fibre*, *metre*, *litre* (but *meter* for a measuring instrument)	***-er*** e.g. *center*, *fiber*, *meter*, *liter*
-yse e.g. *analyse*, *dialyse*	***-yze*** e.g. *analyze*, *dialyze*
*alumin**ium***	*alumin**um***
*gr**ey***	*gr**ay***
*m**ou**ld*	*m**o**ld*
*progra**mme*** (general) or *progra**m*** (computer)	*progra**m***
*sul**ph**ur* or *sul**f**ur***	*sul**f**ur*

*One ending should be used consistently.

**Since the 1990s, the International Union of Pure and Applied Chemistry and the Royal Society of Chemistry have recommended that European chemical publications use the spelling "sulfur".

For more examples, see CSE (2006). If in doubt, consult a dictionary.

Compiled by Sylwia Ufnalska