

IMPORTANT: If a protocol does not comply with these guidelines in its form, it will not be recognized and will be returned uncorrected!

Guidelines for the preparation of a scientific protocol for the **iMarsys06/07**.

The written proof of performance is provided in the form of a scientific protocol in which the project worked on is presented. Scientific protocols are, so to speak, "recipes" that should allow a successful repetition of an experiment. Therefore, it is important to document relevant conditions/parameters during the experimentation in order to be able to include them in the protocol. If you add an introduction including the research question, results and their discussion, a protocol approaches a scientific publication/article.

General comments:

- o Short & concise paragraphs are better than long-winded formulations!

Table 1: Example of good and bad expression

=(=)
„...Unfortunately, we found that there was no pronounced zoning as we had expected and as experts confirmed to us ...“	We could not detect any distinct zonation according to Meier (1998) in our study area.

- o Quality before quantity!
- o Leave out filler words!
- o Valuations such as "unfortunately" have no place in scientific language. Is the sentence unambiguous?
- o Adhere to the following structure:
 - Title page (who did what?)
 - Introduction (what is this about?)
 - Material and method (with what did I do what?)
 - Results (what are the results of the study?)
 - Discussion (what do the results mean in the context of what is known so far?)
 - Literature (who said it?)
- o Numbers from one to twelve are written out in the text (eight individuals), unless they come before a unit of measurement (1 m). Numbers at the beginning of a sentence are also written out. Abbreviations are to be explained when they appear in the text for the first time.
- o German or English species names are not unique. Therefore, the Latin species name (in italics and in parentheses) is given at the first

mention. Generally, genus and species names are written in italics.
E.g. Common blue mussel (*Mytilus edulis*)

- o Please use 'Times New Roman' (or 'Calibri') font, font size 12 pt, standard formatting for page margins (2.5 cm left and right), and justification formatting.

Title page

Title of project, title of course, name of course instructor(s), date of course, names of authors with contact address (email).

Introduction

An introduction briefly and precisely introduces the topic under investigation. It explains contexts and backgrounds (theories) and leads to the research question. The introduction explains to the reader why this question/problem was addressed and what the current state of science is. For this purpose, the authors of the relevant literature used **MUST** be cited correctly (see "Proper citation"). The introduction should conclude with the specific question/issue.

Length: approximately 1 page of text. At least 3 different sources should be used/cited.

Table 2: Example of good and bad introduction of the subject

=(=)
"... We looked at the topic of animals in the intertidal zone in today's course day ..."	Various organisms live in the special habitat of the intertidal zone (Storch and Welsch, 2005).

Material and methods

This part serves to enable an uninvolved person to copy the experiment or the measurements without any problems. It is described concisely, completely and neutrally how something was done (not what!). For experiments in the laboratory, the experimental setup is described, if necessary with a drawing, all used experimental materials, chemicals, software etc. In addition, the methodology of data analysis is described, especially the statistical tests used. For field studies, the methods and study area are also described, with a map if necessary. This part is written in the past tense.

In our case, citation of technical literature is not necessary here.

Length: approx. 1 page text (+ tables/figures).

Table 3: Example of good and bad method description

=(=)
"...The following materials were available..."	The experiment was conducted with the following materials: ...
"...First, we ran into the mudflats with our buckets and..."	At site X, we collected Y samples per transect (Fig. XYZ).

Results

Here the results are presented neutrally and without evaluation in text form (no interpretations!). This part is also written in the past tense. In addition, figures and tables can be used for illustration. These do not replace the text, nor can they stand in "empty space" without reference. The reference is usually at the end of the sentence (Fig. 4). The text should concisely describe the content of the tables/graphics and draw attention to the most important aspects. The text should guide through the tables/figures, but not repeat (duplicate) the measurement result.

The data is presented **either** in a table **or** in a figure. Tables include a **table caption (above the table)**, while figures (maps, photos, graphs, etc.) include a **figure caption (below the figure)**. The captions/subscriptions should be concise and reflect the presentation. **The captions as well as the legend must be chosen in such a way that a table/figure can be understood without the text!** Tables and figures are numbered consecutively with separate numbering (Fig. 1, Fig. 2; Table 1, Table 2).

Diagrams must have a labeled x- and y-axis. Select a meaningful form of representation (column, bar, pie, dots). Please do not use 3-D representations! Maps have a north arrow and a scale. For photos or graphics that you did not create yourself, please include the sources in the figure caption. It is not necessary to provide a list of figures.

The results section does not contain literature citations!

Length: approx. 2 pages of text (+ tables/figures).

Table 4: Example of good and bad result representation

=(=)
"...Table 1 shows our measurement results..."	The number of species found increased with increasing habitat structure (Fig. 1) [or (Tab. 1)].
"...Figure 1 shows that the number of species changes across habitats..."	
".. The test shows that the development time differs between males and females."	The development time in females was significantly shorter (T-test, FG =12, t=2.3, p< 0.05).

Discussion

The discussion usually starts with a short summary of the most important results. Afterwards, own results are discussed with regard to the research question using literature and compared with other studies. The question posed in the introduction is answered and the hypotheses raised are confirmed or rejected. The following questions may help in writing the discussion: *To what extent do your own results contribute to clarifying the initial question? Are there similar or controversial results in the literature? Why are they similar or different? Were there limitations due to the method used? What questions remain unanswered and how might these be investigated (experimentally)?* Length: about 3 pages of text. At least 5 different sources should be used in the discussion.

Literature

Only literature that has also been cited in the text is listed (see "Correct citation")! Citations are only useful if you can find the related publication. Therefore, it is necessary to list the relevant information. Depending on the journal, there are variations in the layout. It is important to decide on one layout and to implement it consistently!

The cited publications are sorted alphabetically by first author. In the bibliography, all authors of a work are listed, even those who were abbreviated with et al. in the continuous text.

Example of citing an article in a journal:

Bowers MA, Brown JH (1982). Body size and coexistence in desert rodents: chance or community structure? Ecology 63: 391-400.

Example of chapters in a book:

Freeland WJ (1991). Plant secondary metabolites: biochemical coevolution with herbivores. In: Palo RT, Robbins CT (eds). Plant chemical defenses and mammalian herbivory. CRC Press, Boca Raton, pp. 61-82.

Example of a book:

Lamprecht J (1992). Biologische Forschung: von der Planung bis zur Publikation. Verlag Paul Parey, Berlin.

Example of an internet source:

Floraweb, Bundesamt für Naturschutz. <http://www.floraweb.de/>.
Zugriffsdatum und Uhrzeit.

Cite internet sources only for pictures, exceptionally also for other contents (e.g., guidelines federal offices, red lists...)!

Proper citation

All information taken from literature **MUST** be supported by a source citation. In natural science, a citation means a reference and not the reproduction of a text passage in the original sound!

As a rule, citations are made in the sense of the text; the author and year of publication are placed in parentheses after the content of the citation. The citation method with footnotes is **not** used in the natural sciences. Very rarely is a literal citation used (e.g., for definitions): If this is the case, the

citation is placed in quotation marks and the author, year of publication, and page number(s) are given in parentheses.

A citation in the text looks like this: "Bla bla bla (Drees & Tams, 2013)". If there are more than two authors, only the first is cited and all others are abbreviated as et al. (Meier et al., 2012). Internet pages that refer to Wikipedia, pages of private persons, dubious associations, schools, etc. **are not accepted as sources!**