

## About the moves in physics experiment reports

While there are a variety of article types in sciences, and I have included samples of three on the Moodle site, the standard one we teach all students is the research article, or more specifically, the experiment report (since we teach students how to report *experimental* but not *theoretical* work.) The “moves” that are made in this genre are perhaps no more strictly mandated than in other disciplines’ genres, but they are arguably more overt – they are tied to the allowed structure of the report with its Abstract, Introduction & Theory, Equipment & Procedure, Data & Results, Discussion & Conclusion. The exact headings may change from one journal to another, but that is largely cosmetic; the flow of the argument from one stage to the next is hardly varied. Of course, what goes into writing one of these reports can be discussed in terms of different scales of moves – the very broad strokes that guide how an article is written, the more specific functions performed by each section of the article, and the still-more-detailed, sentence-scale moves that ensure the job of the sections is not undermined by steps that would be considered ‘unprofessional’ or, more accurately, out of genre.

The broad-stroke move is

*‘do everything you can to be convince your reader that your conclusion is correct.’*

Briefly discussing the stakes and extent may make this a little less vague. The claim that’s being advanced in an experiment report is singular (e.g. the activation energy for silicon dimer hopping across rows is  $1.75 \pm 0.10$  eV), and the report is judged either wholly correct or incorrect, like a test that is graded Pass/Fail. A contribution that is ‘interesting’, ‘furthers an ongoing discussion’, or ‘provides a new and useful approach’ but is identified as suspect or flawed in any way is generally rejected as being no contribution at all (there is actually another genre and set of journals for not communicating an experimental result but communicating new approaches and tools that *can* be applied to experiments.) It follows that special care must be taken in these experiment reports to eliminate all doubt from the reader’s mind. Some of this is stylistic

*– you take no linguistic liberties that would risk confusing your readers or their not taking you seriously.*

Some of this is more substantial

*– all assertions must be supported either by your own description of experiment, data, analysis, etc., or by references to other works in which the assertions are, presumably, supported by their description of experiment, data, etc.*

The only serious doubt that should enter the reader’s mind is that which you’ve introduced, analyzed, and contained (e.g.  $\pm 0.10$  eV.)

## About the moves in physics experiment reports

Slightly finer-grained moves can be described in terms of what is done in each of the general sections of the report. What follows bears on almost any scientific writing, yet it is easily obscured when communicating to students the still-finer-grained expectations specific to the genre of experiment reports.

### Structure of a Scientific Paper (largely based on Alley's Craft of Scientific Writing)

#### a. Beginning

##### i. Title

1. Is Clear and Exact
2. Identifies field (note, journal selection may do some of this already)
3. differentiates from other works in the field

##### ii. Introduction

1. tells what the work is
2. tells why the work's important
3. gives (or at least directs toward) the background necessary to understand the work
4. gives a road map for how the work will be presented in the Middle of the paper.

##### iii. Summary (a key component of the introduction)

1. Further helps to differentiate the present work from other ones in the field
2. Two main types
  - a. Descriptive: tells what *type* of info will appear, but doesn't actually give much of the info.
  - b. Informative: gives the key info.
3. If the paper is primarily *informative* it should give the main conclusions. If it's primarily *persuasive*, it may not.
4. Gives a Road Map for the Middle of the paper to help the reader navigate and contextualize the different points that will be presented.

#### b. Middle

##### i. Strategy(ex. chronological, spatial, energy flow, etc.)

1. a single strategy is consistently employed
2. the chosen strategy is appropriate

##### ii. Subsections

1. They're not too long, not too short
2. headings
  - a. they're grammatically parallel to each other
  - b. they're informative (as opposed to being too vague)

#### c. Ending

- i. Presents no new information
- ii. Important information from the Middle is analyzed holistically
- iii. The Future Perspective is offered (the future of this work or how the results may be of use)