‘Write Right’ in Science

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What is the purpose of this piece of Writing ?
What is the reader looking for ?

Exam answer : rewarded for knowledge shown and application of that knowledge.

Experimental write-up : accuracy/reproducibility of the account.

Lecture notes : memorable, logical summary of information for later review.

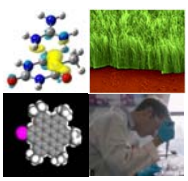
Demonstrate learning or an acquired skill :

Types of Scientific Writing

- Research Report
- Research Proposal
- Research Publication
- Scientific Laboratory note-taking

In a Variety of Forms

- Presentations
- Conference abstracts
- Scientific debate
- Research Strategy
- Literature Review
- Multi-media highlight



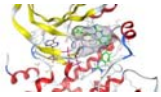
Research Report

- Annual – for a specific period of time
- Outlines research achievements
- Benchmarks these against original proposal – timeline/milestones/deliverables
- Quantifies the outputs
- Accounts for the expenditure
  - personnel
  - equipment
  - travel
- Articulates how the project will develop from this point in time

Research Proposal

Persuasive document

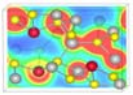
- Articulates an idea – why/how it is novel in relation to what has gone before
- Gives an evidence-based account for why it is worthwhile
- What makes your approach probable and unique ?
- What problem does it solve ?
- How you can measure success ?
- Justifies what is required



Research Publication

- **Permanent record of a discovery and its dissemination**
- **Very well-defined format**

Abstract (stand alone account of what has been achieved)
Introduction (explains what you set out to achieve and puts the work and its value in context)
Results and Discussion (experimental data, how it was obtained, analysis of what it tells you, why the results have value) – Supporting Information Section
Conclusion
Acknowledgements
References



Scientific Laboratory note-taking

Dated contemporaneous account of an experiment performed by you giving:

- the preparatory thinking – safety precautions
- the appropriate tabulated reagents/amounts/conditions
- Structures/balanced equations/drawing of apparatus
- All calibrations/equipment details
- Exactly what was done and with what
- All conditions of the equipment - timescale
- Post-experiment follow-up – spectra/yields/analysis/sample labels/
- Conclusions
- Repeats

'Structuring science essays and reports in your undergraduate degree programme'

This is formal training which hopes to teach YOU with the essential skills you need to write a 'research publication'. This is mainly done through 'laboratory write-ups'.

- Laboratory Reports have a specific format
- (i) Title
- (ii) Introduction
- (iii) Method
- (iv) Results
- (v) Discussion
- (vi) Conclusion

BEFORE YOU BEGIN ALWAYS

- READ the experiment
- THINK – Why am I being 'made' to do this experiment and not a different one ?
- ANALYSE - What am I expected to learn from it ?

The Title !!! Date and Your name (and that of your demonstrator/partner)
The Introduction

Hypothesis:

- This experiment will demonstrate how the results of a series of qualitative tests can be used to distinguish one sample in a set of samples from the others.
- It will show how using physical properties (such as appearance) and a set of chemical tests, 15 randomised samples can be identified.
- The experiment will entail the careful recording of observations arising from a planned and ordered set of chemical reactions.
- Each test will result in chemical changes (precipitation, evolution of a gas, colour change) that can be mapped according to the known chemical behaviour of specific anions and cations.
- The experiments will involve solubility and confirmatory tests e.g. flame tests.
- Through this series of experiments it will become clear how by careful planning and using inexpensive and historically significant test reactions, chemists were and are in a position to identify samples of ionic salts without resorting to a spectrometer.

The Method

- **Written dispassionately and in the 3rd person**
- **A precise and accurate account of what you did …… including precautions……**

C.D. Jones, *J. Chem. Educ.* **2011**, 88, 1062-1068

The Results

- All the data (units, spectra, observations) that you obtained
- Once you leave the laboratory – you are on your own…….
- Use tables, calculations, figures, schemes, balanced equations, graphs
- Everyone of the above MUST have a stand alone caption and must be referred to and discussed in the next section

The Discussion

- The detailed logic behind the conclusion you are going to make.
- References should be made to each piece of data in the results section

The Conclusion

- What has been achieved in doing this experiment ?
- Refer to your Introduction
- A take home message – advantages/disadvantages of the process
- What could be improved ?


YES
you can!
improve
your scientific writing !!!!