

# Writing a Research Report

Like poetry and music, scientific papers and research reports follow a standard format. This format has evolved over centuries to make it fast and easy to get at the question, results, and meaning of someone's research. It may seem cumbersome at first, like an unfamiliar meter or a new style of music, but once you get the hang of it, you can zip through dozens of papers, only taking what you need and leaving the rest.

The word counts below are suggested, and are actually a little low for a full blown paper. If you stick to them, then every word has to mean something - no padding! It will be ok to go over somewhat, but again, no padding.

**Abstract**\_ 100-200 words: This summarizes the main sections of the paper, and includes the question and why it is useful or interesting, your hypothesis if it is relevant (may not be needed in a descriptive paper), a brief description of methods and results and clearly states how the results answer your original question.

**Intro** - 200-300 words: You must write a short essay which briefly describes what scientists already know (use the lecture and discussion notes, chapters and research papers for this background) and then propose a question, a short description (1 or 2 sentences) on how it will be answered, and what answer you expect to find.

**Materials and Methods**\_ 200 words: You must use a narrative format with enough detail that someone could copy your methods and arrive at a similar result. It is ok to cite the Journal of Honors Lab Investigations (JHLI) for methods but **you must use your own words**.

**Results** - 150 words: This section must have table(s) and/or graph(s) and must briefly explain what the data in the table or graph show. Wherever more than one sample has been taken, mean and standard error should be calculated and given, and/or slope of the line should be calculated and given.

**Discussion** - 200 words: This section must repeat the question, your answer, whether it was what you expected, and what it means relative to the big picture. It must also suggest a new research question.

**Citations**\_ You must cite at least two sources, the chapter and the research paper. You can cite additional science sources (not encyclopedias) for one extra credit point .

**Format**- Type the paper. Use 12 point Times or Times New Roman or a similar font. Use 0.5 to 1" margins, and single or 1.5 spacing except where it is indicated otherwise. Number all pages. Tables and graphs may be hand drawn (neatly) or produced on the computer. Use 14 point bold face for heading up each section. Do not allow tables to cross pages, format pages so the table is all on one page. Put your name, lab group number and title of your paper in the upper left hand corner. Then put your title, then the abstract, and then each subsequent section

**While you may collect data in a lab group, all research reports are individual and should be written independently.** You may consult with your lab group on how to graph and interpret data, share sources of information, and you may even have lab members read your report and offer advice. However, any evidence of copied writing will be considered plagiarism.

## Lab Notebooks

Everyone is required to have a **bound lab notebook**, one where pages cannot be torn out or inserted. You should record all your data, notes and questions in this book in ink\*. You should date each entry. If you print out graphs and tables, you should staple or glue the printout into your notebook and date the entry. (\*it is ok to do drawings in pencil)

## Supplementary Materials in Lab Manual

### Basic Math and Science

Math: Algebra, Statistics, Exponential Notation, Significant Figures, Linear Regression

Physics: Particles, 2 Laws of Thermodynamics, 3 Laws of Motion

Chemistry: Elements, Ions, Isotopes, Energy Levels, Periodic Table, Molecules, Chemical Equations

Biology: Cells, DNA, Proteins, ATP, Homeostasis, Evolution, Classification, Species

### Logistics

Making a Graph: x & y axis, scatter graph, line graph, histogram, scale, style, captions

Science Writing: Plagiarism, Quotes, Peer Review, Finding Papers, Citation Formats

Working in Groups: Key Roles, Basic Courtesy, Conflict, Peer Evaluation Form

### WLP 2006 Chapter 5. Chemical Reactions II: Acid-Base Reactions

Acid-Base Concept

Salts

The meaning of pH

Strong and Weak Acids and Bases

Buffers

Acids, Bases and Living Tissue

The Sulfur Cycle and Acid Rain

## Research Report Grade Sheet (20 points)

Name \_\_\_\_\_ Topic \_\_\_\_\_ Grade \_\_\_\_\_

Abstract (3 points)	question	why it matters	hypothesis	methods	results	interpretation
Introduction (4 points)	context & question	what is already known	why answer matters	hypothesis		
Materials (2 points) & Methods	narrative <b>in own words</b>	adequate detail				
Results (4 points)	table or graph	appropriate	calculations	results in text in narrative format		
Discussion (4 points)	question, hyp, results restated	hyp confirmed or disproved	what does it mean	further question		
Citations (2 points)	research paper	other source chapters, sci. lit., lecture				
Format (1 point)	follows format in manual					