Purpose of Lab Reports

- Explain the intention of conducting these experiments.
- Lead readers step-by-step through your methods.
- Display and discuss the results.
- Provide plausible reasons for readers to accept your conclusions.
- Narrate the story of the experiments.
Section Style Overview

• The **Abstract** could be reviewed quickly and acted upon by a top executive.

• The **Introduction and Background** and **Conclusion** sections provide non-technical detail and narrative for a general audience.

• Professionals in your field will understand and could duplicate the experiment from your **Experimental Methods, Results and Discussion**, and **Appendices** sections.
Avoid Plagiarism

- Write your report on your own
- Do not copy others’ work
- Do not write collaboratively
- Cite all sources
- Apply quotation marks when using sources verbatim

For more information on avoiding plagiarism, see also:
- Understanding and Avoiding Plagiarism (HCTC).
- Source Use and Plagiarism Policy (HCTC).
- Student Academic Handbook (University of Iowa).
Writing Guidelines

• Use complete sentences.
• Pay attention to verb tense.
  • What was done in the lab: past tense
  • The purpose of the lab and your conclusions: present tense
• Avoid “I” or “we” statements. Use passive voice when needed.
  • Example: “The experiment was conducted under these circumstances.”
    
    **NOT:** “We conducted the experiment under these circumstances.”
• Do not make bulleted lists within the body of report.
## Word Choice

<table>
<thead>
<tr>
<th>Avoid these words/phrases:</th>
<th>Substitute these:</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Did, made, saw, etc. (weak verbs)</em></td>
<td>Collected, reported, determined, created (strong verbs)</td>
</tr>
<tr>
<td><em>Results were found</em></td>
<td>Results were observed, measured, obtained, calculated</td>
</tr>
<tr>
<td><em>A study/experiment was done</em></td>
<td>A study/experiment was conducted, performed</td>
</tr>
<tr>
<td><em>Weigh / weight was taken</em></td>
<td>Weight was measured</td>
</tr>
<tr>
<td><em>Possible</em></td>
<td>Feasible</td>
</tr>
<tr>
<td><em>Experiment (verb)</em></td>
<td>Investigate</td>
</tr>
</tbody>
</table>
Abstract

The Abstract should address these five issues:

1. **Who requires these lab tests and why** (present tense)
2. **Purpose and scope of tests** (past tense)
3. **How the tests were conducted** (past tense)
4. **Results** (past tense)
5. **Conclusion/Recommendation** (present tense)
Introduction & Background

Introduction

• Introduce subject of the lab
• Describe the problem that the experiment attempts to solve
• Include definitions of terminology
• Include who, where, and when

Background

• Include theoretical values for material properties (tensile strength, hardness, coefficient of expansion, etc.)
• Specify the materials to be tested
• Introduce equations
Experimental Methods

• Describe:
  • test(s) that you conducted
  • methods that you used

• Include relevant photos or illustrations of equipment used
Results & Discussion

• Summarize major findings
• Include values calculated and/or measured
• Indicate additional analyses or experiments needed
• Describe assumptions made
• Represent data in a table or a graph (if needed)
• Typically write in past tense
Guidelines for Tables and Figures

• Place titles above tables

Table II: Hardness test results of 1018 steel before and after water quench

<table>
<thead>
<tr>
<th>% change</th>
<th>Hardness after Treatment (HB)</th>
<th>Hardness before Treatment (HB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>+33.3%</td>
<td>60</td>
<td>45</td>
</tr>
<tr>
<td>-6.7%</td>
<td>42</td>
<td>45</td>
</tr>
</tbody>
</table>

• Place captions below figures

Fig. 4: Stress-strain curve illustrating the elastic and plastic deformation of the untreated aluminum bolt before failure. (Credit: Allison Rowe)
Other Guidelines for Tables and Figures

• Labels:
  • Graphs, figures: “Fig. [#]”
  • Tables: “Table [#]”
  • Note that graphs are not labeled “Graph.”
• Include critical tables and figures in the body of the report.
  • Less important figures and tables can go in the appendix.
• Always introduce your figures or tables in writing prior to their inclusion in your report.
• Keep all parts of a table or figure on the same page.
Conclusion

• Include a two- to three-sentence summary of the report
• Tell a brief story of the experiment
• Make a recommendation or discuss future implications
References

- In-text citations should be (author, year)
- Reference list should be in APA style
- Use the APA Documentation Guide from Purdue University’s Online Writing Lab.

In-text:
The aluminum alloy 2024-T3 has a hardness of 120 using the standard Brinell hardness method (MatWeb, 2007).

References:
Appendices

• Include materials that may not fit into the body of the report, but contribute value or add clarity
• Do not include raw data
• Title each appendix (e.g., “Appendix A: Tables” or “Appendix C: Example Calculations”)

Visit the Hanson Center

- You will receive extra credit for one HCTC visit for one lab report this semester.
- You may return as many times as you would like!
- Sign up for an appointment online by clicking “Schedule Now” on our [website](#).

<table>
<thead>
<tr>
<th>Hours</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mon-Thurs</td>
<td>3307 SC</td>
</tr>
<tr>
<td>Tues night</td>
<td></td>
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<td>Fri</td>
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</tr>
<tr>
<td>Sun</td>
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Questions?