ABE 20100

Laboratory Notebook Guidelines

Rationale. Whether in industry, academic, or government work environments, laboratory notebooks are critical documents for research and engineering design. They are *primary legal documentation of inventions* and can be the basis for supporting intellectual property and patent applications. They are also the documentation that allows anyone (including you at a later date) to repeat and perform the same procedures in the future. Science and engineering is founded in this principle called *autonomous replication*. Our entire framework of science and engineering is based on only accepted scientific results that can be reliably replicated by others.

Features of a Good Lab Notebook
- ☐ Contains enough detail that another person of comparable skill could repeat your experiment and obtain the same results using only the lab notebook.
    - o Contains complete protocols
    - o Contains thorough observations
    - o Contains all raw data and calculations

- ☐ Contains enough detail that you can effectively troubleshoot your procedures should you obtain results that are not what you expect.

- ☐ Is neat and easy to read by you and others
- ☐ Makes use of tables, figures, photographs and drawings to organize data and illustrate procedures, set-up, observations, and results
- ☐ **Each page contains a date and your signature at the bottom**
- ☐ Uses headers to organize (example for lab work below)
    - o Aim/purpose
    - o Materials & Equipment Set-Up
        - ▪ Includes process diagram or drawing of equipment set-up
    - o Procedures and Protocols
        - ▪ Includes all variables and order that they were varied
        - ▪ Should be detailed and step-by-step accounting of what you did
    - o Results
        - ▪ All raw data
        - ▪ Organize numbers into tables when appropriate
        - ▪ Make and document observations
        - ▪ Sketch/Graph data as you go.
        - ▪ Tape in all photographs, images, printouts, etc. Date and initial each taped in item
    - o Calculations that were made for the procedures
        - ▪ E.g. dilution calculations, mass to mole conversions for weigh outs etc.
- ☐ Analysis and Interpretation
    - o Document your thoughts and observations on the results
    - o Rationale and your thought process of why you did what you did
    - o What you think the data means at the time you are recording it
    - o Preliminary conclusions from the experiment