Formal Lab Write Up

**Details**

Due Date for Lab Write Up: Tuesday, October 17th at the beginning of your class.

**Abstract**

The abstract presents a synopsis of the experiment. The following guidelines for preparing an abstract arise from the American Institute of Aeronautics and Astronautics (AIAA):

The abstract should be written concisely in normal rather than highly abbreviated English. The author should assume that the reader has some knowledge of the subject but has not read the paper. Thus, the abstract should be intelligible and complete in itself; particularly it should not cite figures, tables, or sections of the paper. The opening sentence or two should, in general, indicate the subjects dealt with in the paper and should state the objectives of the investigation. It is also desirable to describe the treatment by one or more such terms as brief, exhaustive, theoretical, experimental, and so forth.

The body of the abstract should indicate newly observed facts and the conclusions of the experiment or argument discussed in the paper. It should contain new numerical data presented in the paper if space permits; otherwise, attention should be drawn to the nature of such data. In the case of experimental results, the abstract should indicate the methods used in obtaining them; for new methods the basic principle, range of operation, and degree of accuracy should be given. The abstract should be typed as one paragraph. Its optimum length will vary somewhat with the nature and extent of the paper, but it should not exceed 200 words.

**Introduction**

The "Introduction" of a laboratory report identifies the experiment to be undertaken, the objectives of the experiment, the importance of the experiment, and overall background for understanding the experiment. The objectives of the experiment are important to state because these objectives are usually analyzed in the conclusion to determine whether the experiment succeeded. The background often includes theoretical predictions for what the results should be.

**Materials & Methods**

The "Procedures," often called the "Methods," discusses how the experiment occurred. Documenting the procedures of your laboratory experiment is important not only so that others can repeat your results but also so that you can replicate the work later, if the need arises. Historically, laboratory procedures have been written as first-person narratives as opposed to second-person sets of instructions. Because your audience expects you to write the procedures as a narrative, you should do so.

Achieving a proper depth in laboratory procedures is challenging. In general, you should give the audience enough information that they could replicate your results. For that reason, you should include those details that affect the outcome.

**Results**

The heart of a laboratory report is the presentation of the results and the discussion of those results. In some formats, "Results" and "Discussion" appear as separate sections. However, P.B. Medawar [1979] makes a strong case that the two should appear together, particularly when you have many results to present (otherwise, the audience is faced with a "dump" of information that is impossible to synthesize). Much here depends upon your experiment and the purpose of your laboratory report. Also, use your judgment. For instance, combine these sections when the discussion of your first result is needed to understand your second result, but separate these sections when it is useful to discuss the results as a whole after all results are reported.

**Discussion**

Usually, the objectives mentioned in the "Introduction" are examined to determined whether the experiment succeeded. In discussing the results, you should not only analyze the results, but also discuss the implications of those results. Moreover, pay attention to the errors that existed in the experiment, both where they originated and what their significance is for interpreting the reliability of conclusions. One important way to present numerical results is to show them in graphs.

**Recommendation Letter**

 This is the letter that you are mailing to your customer about the results of the tests. The customer doesn’t need to know how the tests were performed. All they are interested in is the results and how they can improve their soil. Be sure you create the letter in a business format.