Purpose

1. To investigate and explain the current understanding of a chosen topic in Meteorology
2. To describe the results of a personal research experiment
3. To explore real-life meteorology events

Assignment

During this semester, you will have the opportunity to take anything from weather you have wanted to learn more about, and perform an experiment on your own. The objectives of this research paper are to:

1. Allow a personal investigation of the current knowledge of your chosen field
2. Communicate the findings of your investigation and the results of an experiment in your chosen field
3. Apply your new understanding to real-life weather events

These projects can be done individually or as groups (up to 5).

The final product will be a 203 page written presentation of your studies and your experiment.

The paper will consist of 5 parts, and references:

1. Introduction
   a. Present the topic, the question, and your hypothesis
2. Background research
   a. Summary of readings
3. Description of experiment
   a. What are you trying to show?
   b. How are you going to show it?
4. Presentation of results
5. Conclusion
   a. What do your results tell us?
   b. Real-life events if you have any
   c. How can this impact your reader or society in general?
6. References
There are multiple days scheduled through the semester that will be dedicated to research, when we will discuss each aspect and spend time preparing questions.

- **Day 1: September 24**
  - Explanation of paper
  - Organization of groups (if desired)
  - Plan of experiment and proposal
- **Day 2: October 10**
  - To bring: summaries of individual readings
  - In class:
    - Group compilations of summaries
    - Plan for executing the experiment
- **Day 3: October 29**
  - To bring: results of experiment
  - In class: write the following
    - Description of the experiment
    - Results of the experiment
    - Meaning of results and impacts on society
- **Day 4: November 12**
  - To prepare:
    - Combine reading summaries, experiment description, results, and conclusion into one paper
    - Write an introduction stating the topic, what is being tested (not the experiment itself), and hypothesis
  - To bring: Full draft of paper (one copy for each member of the group)
  - In class: Peer Review by other students
- **Final Draft Due: November 26**

Here are some ideas for finding a research project, as well as topics of past research papers

- Look for questions at back of the chapter
- In-depth and case studies in the middle of chapters
- Is there an aspect of Meteorology that might affect your chosen major here at DSC?
- For math students: equations and mathematical concepts in appendix
- Other ideas:
  - Hot water on freezer freezes faster than cold water
  - Does water really drain counter-clockwise in a toiler in the northern hemisphere?
  - Baking with a bowl of water in the oven to increase humidity
  - Study of a particular weather event (e.g., Hurricane Andrew, Superstorm Sandy, the Little Ice Age)
Grading

The paper will be worth a total of 100 points, and will be divided as follows:

- Proposal (10 points)
- Summary (10 points)
- Experiment and results
  - Description of the experiment (10 points)
  - Description of the results (10 points)
  - Conclusion (10 points)
- Peer Review (10 points)
- Final paper (40 points)

Each portion listed above will be graded on completion of the following criteria:

Proposal (10 points)

1. Topic
2. 2 resources
3. Explanation of experiment
4. Plan

Summary (10 points)

1. Individual summary completed before class
2. Group summary - graded on relevance to the main topic (1-5 scale)
   - 5 points: Accurate link of reading to the topic
   - 3 points: Relevant but not well-linked to the topic OR well-linked, but not relevant to the topic.
   - 1 point: No relevance at all to topic and experiment

Description of the experiment (10 points)

1. Clearly explains how the experiment was performed (in paragraph form)
2. Lists non-trivial equations or formulas used in calculations

Discussion of the results (10 points)

1. State the numerical results of your experiment
2. Clearly describes any figures that may be included
3. Summarizes the significance of the results

Conclusion (10 points)

1. Addresses the hypothesis
2. Do you address the meteorology that is acting behind your experiment?
3. Did you describe any possible impacts on individuals or society? (i.e. Why do we care?)
Peer Review (10 points)

1. Was your paper reviewed?
2. Did you review someone else's paper?

Final Paper (40 points)

Your grade for the final paper will be judged as:

35-40: Clear writing that can be easily understood by your classmates. The transition from one section to another is smooth and aids in the readability. The research and experiment both relate to the main topic. All thoughts are tied together neatly and concisely in the conclusion. All other requirements (page length, references, etc.) are met.

30-35: The paper is well done and is easily readable by your classmates. There are only a few spelling/grammatical errors or disjointed thoughts. The research and experiment both relate to the main topic. All thoughts are tied together neatly and concisely in the conclusion. All other requirements (page length, references, etc.) are nearly all met.

25-30: The paper is more difficult to read due to multiple spelling/grammar errors or disjointed thoughts. The research and/or experiment are not completely relevant to the topic. However, you are still able to present important information from your research and experiment. The experiment is completed with (mostly) clear results.

15-25: Paper is difficult to read due to many errors. One or more sections of the paper (introduction, reading summary, etc.) is/are missing. Good experiment, but contains significant holes in its execution and results. Much of the research is not relevant to the experiment or to the hypothesis. There is an obvious lack of effort to improve from earlier stages and drafts.

0-15: Paper is incomplete. There are multiple grammatical errors. There was little or no relevant research. The experiment is incomplete.