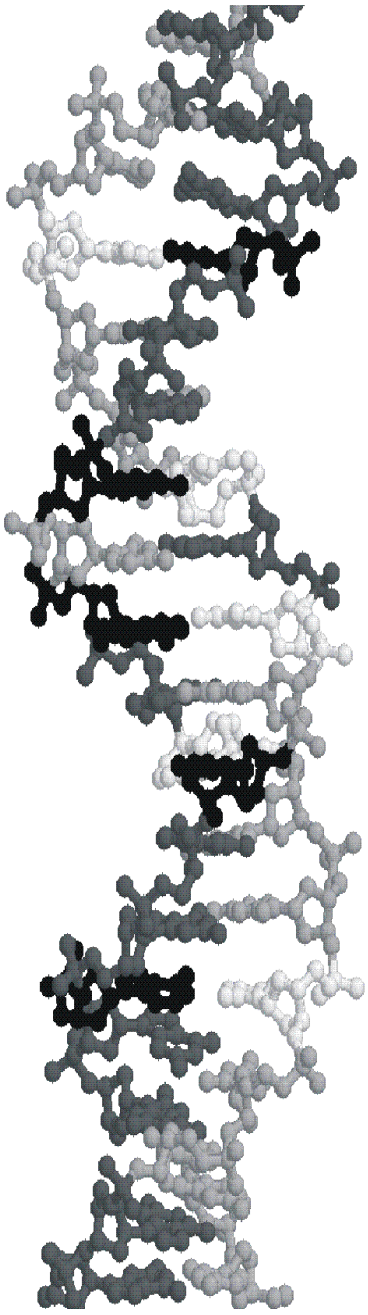
Dear AP Biology Student,



Welcome to AP Biology!! I look forward to working with each and every one of you to make this a fun, exciting, and successful year.

This packet includes your summer assignment. Please read it carefully, work on each part thoughtfully, and above all do NOT wait until the last minute. In order to be successful in AP Biology you must be diligent in your study and work habits, and that starts with the summer assignment.

The due dates for each part are listed in the packet.

I will be available via email over the summer. If you have any questions at all, please do not hesitate to contact me. Have a great summer!

Ms. McCain
Krista_L_mcclain@mcpsmd.org

AP Biology Summer Assignment

Part 1: Create a Professional Email Address (Due Date: Friday, August 10, 2012)

- If you do not already have one, create a *professional* email address
- Send me an email from this account so that I can add you to my AP Biology contact list

Part 2: Experimental Design (Due Date: First Day of School, Monday, August 27, 2012)

- Read the Laboratory Objectives, Introduction, and Exercise 1.1 and 1.2
- Answer all questions in Exercise 1.1 and 1.2
- Omit Exercise 1.3, 1.4, and 1.5
- Complete all of the "Questions for Review" from page 20-27
- Read Appendix A: Scientific Writing
- Fill in the Guided Notes Outline: "Experimental Design and Scientific Writing"
    - Both a template and the outline are included
    - Use the template to guide you to the correct information
    - Write you notes on the blank outline provided
    - If you would prefer to type you notes, the template is available on my website (www.kristamcclain.com) under AP Biology, Summer Assignment

Part 3: Purchase Supplies (Due Date: First Day of School, Monday, August 22, 2012)

The following is a list of "required" supplies for AP Biology. If for any reason you are not able to obtain the required supplies please contact me via email before Friday, August 10, 2011.

- A 2 inch- 3 ring binder (for this class alone!!)
- Dividers- sections labeled for Class Notes, Activities & Assessments, Work in Progress, Portfolio
- Black Pens or Pencils- no colored ink for assignments that will be turned in
- Paper
- 1 bound composition notebook (not a spiral, the pages should not be removable)
- 2 copies of Signed Student Safety Contract (last page in the packet, also available on the website)
    - Both signed by you and a partent/guardian
    - One to turn in to me
    - One serves as the first page of the lab section of you binder

Experimental Design and Scientific Writing

Name: _____
Date: _____

Scientific Methodology

- **Scientific Methodology Includes**
  - *The five items listed here are the major methodologies you will use while studying biology*
  -
  -
  -

Components of Experimental Design

- **Asking Scientific Questions**
  - The basis of scientific questions comes from *how do scientists develop their questions?*
  - Scientific questions ask about *what do they question?*
  - Scientific Questions require two components
    - The phenomena must be *?*
    - The elements of the question must be *?*
- **Developing Hypotheses**
  - Hypothesis- *define*
  - Hypotheses serve two purposes
    - *List the two purposes of a hypothesis*
    -
  - Hypotheses must be
    - *List and define the two qualities a hypothesis must contain*
    -
  - Testing of a hypothesis may include several methods
    - *What are the three methods of hypothesis testing mention in the reading*
    -
    -

- Limitations
    - Hypotheses can be *after experimentation, what can be determined? (2 options)*
    - Hypotheses can NEVER be *experimentation can never do this*

❖ **Designing Experiments to Test Hypotheses**

- Defining an experiment involves
    - *What three things must be defined before starting an experiment?*
    -
    -
- Three kinds of variables
    - Dependent- *define and give an example*
    - Independent- *define and give an example*
    - Controlled- *define and give an example*
- Designing a Procedure
    - Procedure *define*
    - A procedure should
        - *How and when should a procedure be written and/or modified?*
        -
    - A procedure must account for:
        - Levels of Treatment- *define*
        - Replication- *define*
        - Control- *define*

❖ **Presenting and Analyzing Results**

- Data are organized and summarized into tables and graphs (or figures) and serve two primary functions
    - *what two functions do tables and figures serve?*
    -

- Tables
  - Tables are useful for displaying
    -
    -
  - Guidelines for creating tables include *elaborate on each of the guidelines*
    - Columns should contain *?*
    - Non essential information should be*?*
    - The heading of a column should include*?*
    - Tables should be numbered *?*
    - The title*?*
    - Tables should be referenced *?*
- Graphs
  - A graph can provide *choose the three most valuable characteristics of using graphs*
    -
    -
    -
  - Characteristics of well constructed graphs include
    - The independent variable on the *what axis?*
    - The dependent variable plotted on the *what axis?*
    - Numeric range should be *how should it relate to the data?*
    - The axes should contain *what three components?*
    - The graph must have a *how will you alert people to what is displayed on the graph?*
  - Types of Graphs
    - Line Graphs *when are they used and what kind of data can they appropriately display?*
    - Bar Graphs *when are they used and what kind of data can they appropriately display?*

❖ **Interpreting and Discussing Results**

- Results are interpreted and discussed in light of the *what?*
    - If the hypothesis has been falsified
    - If the hypothesis has been supported

<u>Scientific Writing</u>

❖ **Title Page**

- *What is the first component of the title page and how should it be written?*
- *What are the other major components of the title page?*
-
-
-
-

❖ **Abstract**

- *Where does it go?*
- *How long should it be?*
- The abstract should include
    - *What should it include?*
    -
    -
    -

❖ **Introduction**

- Two Functions
    - *What two functions does the introduction have?*
    -
- The introduction reviews background information
    - *For what purposes?*
    -
    -
- The introduction shod also include
    - *What other components should it include?*
    -
    -

❖ Materials and Methods

- Describes your experiment *how?*
- Should be *written how?*
- Should NOT be *what should you not do?*

❖ Results

- Four Components
    - *What are the four components of a results section?*
    -
    -
    -
- The narrative paragraph should
    - *What major goals should it accomplish?*
    -
    -
- Figures should be included and referenced *how?*

❖ Discussion

- *What will you do in the discussion section?*
- The discussion should ultimately do three things
    - *Refer to step 9*
    -
    -
- 8 major components should be addressed *SUMMARIZE the first 8 steps of writing the discussion*
    -
    -
    -
    -
    -
    -
    -
    -

❖ References

- *What should be listed?*

Experimental Design and Scientific Writing

Name: _____
Date: _____

Scientific Methodology

- **Scientific Methodology Includes**
  -
  -
  -
  -

Components of Experimental Design

- **Asking Scientific Questions**
  - The basis of scientific questions comes from
  - Scientific questions ask about
  - Scientific Questions require two components
    - The phenomena must be
    - The elements of the question must be
- **Developing Hypotheses**
  - Hypothesis-
  - Hypotheses serve two purposes
    -
    -
  - Hypotheses must be
    -
    -
  - Testing of a hypothesis may include several methods
    -
    -
    -

- Limitations
    - Hypotheses can be
    - Hypotheses can NEVER be

❖ **Designing Experiments to Test Hypotheses**

- Defining an experiment involves
    -
    -
    -
- Three kinds of variables
    - Dependent-
    - Independent-
    - Controlled-
- Designing a Procedure
    - Procedure
    - A procedure should
        -
        -
    - A procedure must account for:
        - Levels of Treatment-
        - Replication-
        - Control-

❖ **Presenting and Analyzing Results**

- Data are organized and summarized into tables and graphs (or figures) and serve two primary functions
    -
    -

- Tables
    - Tables are useful for displaying
        -
        -
    - Guidelines for creating tables include
        - Columns should contain
        - Non essential information should be
        - The heading of a column should include
        - Tables should be numbered
        - The title
        - Tables should be referenced
- Graphs
    - A graph can provide
        -
        -
        -
    - Characteristics of well constructed graphs include
        - The independent variable on the
        - The dependent variable plotted on the
        - Numeric range should be
        - The axes should contain
        - The graph must have a
    - Types of Graphs
        - Line Graphs
        - Bar Graphs

❖ **Interpreting and Discussing Results**

- Results are interpreted and discussed in light of the
    - If the hypothesis has been falsified
    - If the hypothesis has been supported

Scientific Writing

❖ **Title Page**

-
-
-
-
-
-

❖ **Abstract**

-
-
- The abstract should include
    -
    -
    -
    -

❖ **Introduction**

- Two Functions
    -
    -
- The introduction reviews background information
    -
    -
    -
- The introduction shod also include
    -
    -
    -

❖ Materials and Methods

- Describes your experiment
- Should be
- Should NOT be

❖ Results

- Four Components
    -
    -
    -
    -
- The narrative paragraph should
    -
    -
    -
- Figures should be included and referenced

- Discussion
  -
    - The discussion should ultimately do three things
      -
      -
      -
    - 8 major components should be addressed
      -
      -
      -
      -
      -
      -
      -
      -
- References
  -