STEM Lite – Polymer Experiment

Name _______________________ Hour 1 2 3 4 5

In this activity you will practice most of the steps required for the STEM project while focusing on an easily researched and tested problem. Some of the steps will be done as a class, and some will be done on your own. The purpose is for you to gain experience in what it is like to complete a STEM project from start to finish.

STEP 1: Define the problem: The problem we will be working on is “Do inert additives affect the properties of a polymer?”

STEP 2: Do Background Research: Use at least two sources to find several facts on polymers. For this stage of the research I suggest simply doing a google search.

a. Each fact and the source where it was found should be written on a note card (5 facts would mean 5 note cards). Or you can create an electronic note page…just make sure to include the source for each fact you put on your note page.

STEP 3: Read Related Research: Use credible/scholarly sources found through the STEM Lite – Polymer Experiment Lib Guide (on the LMC website) to find a scientific study/experiment done on polymers.

a. Include the following info about the study: who did the research, where and when was the research done, what was tested, what did the researchers measure, and what were the results.
   b. Put each fact and its source on a note card or on your electronic note page.

STEP 4: Write up the Research: (This is a mini lit review that will be only two paragraphs long.) Use the facts on your note cards/electronic note page to write a summary of your research. One paragraph will be basic background info on polymers and one paragraph will describe the scientific study.

a. All information should be paraphrased – do not use direct quotes. See page 10 in STEM packet for information on paraphrasing.
   b. Use in-text citations of your sources. See page 11 in STEM packet for information on in-text citations and creating a work cited page (bibliography) using the APA format.

STEP 5: Experimenting: Use the space below to write the specific question your lab group will test. The question should include what you will test (add/change) and what you will measure.

__________________________________________________________________________________________________

__________________________________________________________________________________________________

**Each person needs to keep careful notes while experimenting because you will write up the experiment individually.**
STEP 6: Putting all the parts together: Individually you will complete a “write up” of the entire STEM Lite experience. This includes the literature review (two paragraphs) and the experiment you completed with the polymer. The write up should include the following:

- Descriptive title (1)
- 2 Paragraph lit review – 1 ¶ on polymers in general and 1 ¶ on the experiment you read relating to polymers. The paragraph should use in-text citations (3)
- Problem – state the problem/question that your group investigated (1)
- Hypotheses – list several possible hypotheses including the null hypothesis (H0, H1, H2... (1)
- List of materials – list all the materials you used in your experiment – give rough estimates of amounts (1)
- Procedure – write a clear enough list of steps so that another group could follow the instructions and get the same results (3)
- Data table with quantitative data that you collected, include all data and averages (2)
- Graph showing only averages of your data (2)
- Conclusion – a one ¶ summary of the experiment, include: what your question was, what you changed/added, how you collected data (what your measured), an answer to your question backed up by actual data (numbers), and a mention of experimental errors (3)
- Reference page – minimum of two sources (see page 11 in STEM packet for info on this) (1)
- Use standard writing/organization protocols (2)
  - Type info in the order given in the bulleted list
  - Use 12 point, “plain” font
  - Use headings to distinguish one section from another – headings should be in bold and >12 point font
  - ALWAYS DOUBLE SPACE PARAGRAPHS
  - Pay attention to where page breaks are before you print off or submit your write up (don’t split a data table onto two pages...you may have some extra blank spaces, but this makes the paper easier to follow and read

Grading: The numbers in the parentheses in the above list are how many points that segment is worth (it adds to 20 points). More importantly than the points, you will get practice with almost all the steps you will be completing for your individual STEM project (#priceless).