

# Introduction to Science Research

## Scientific Investigation Proposal Guidelines



**Due Date:** \_\_\_\_\_

Before you may begin your science fair research you must receive approval from your Introduction to Research teacher. Projects must be able to be completed in a time frame of 4-6 weeks, and may require only readily available materials. The safety and ethical components of your proposed investigation will also be considered in the approval process. Proposals may be submitted from single students or teams of two only. It must be typed with all the following parts included and clearly identified. Share your google doc with me at [gmarando@bmcshd.org](mailto:gmarando@bmcshd.org) and give me editing access.

### **Part 1 – Review of Literature** (must be written in paragraph form)

- Paragraph 1 - Describe the phenomena you are studying, fully explaining the actions and variables that affect it, even those you are not planning to test.
- Paragraph 2 - Describe why you have chosen to investigate this topic, why it is interesting or important to you, and what questions you hope to answer.
- Paragraph 3 - Describe some of the current scientific research in the field that you are studying. Reference the articles that you read during our “journaling” lessons.
  - **IMPORTANT:** Use proper citations to identify a minimum of 3 sources (more = better) of information that you used to prepare this section.
    - Ex. In one study, I found that .....(Author last name, year).
    - Ex. In a study by John Brown, 2013, .....

### **Part 2 – Experimental Design** (May be done in list form)

- Identify each of the following experimental components:
  - Title (*The Effect of \_\_\_\_\_ (Ind. Var.) on \_\_\_\_\_(Dep.Var.)*)
  - Hypothesis (*If \_\_\_\_\_ then \_\_\_\_\_*)
  - Independent variable and its levels/treatments
  - Intended sample size and number of trials you will conduct
  - Dependent variable (*specific data to be collected, what are you measuring or observing, units? scale?*)
  - Control group & experimental group(s) set up
  - Constants (as many as possible)
- Remember, an effective controlled experiment will test only 1 independent variable, but may require use of multiple dependent variables.

**Part 3 – Resources Required** (may be done in a combination of lists and paragraphs)

- Identify the resources you will need to perform this investigation, including:
  - Materials
  - Organisms
  - Space
  - Time frame
  - Helpers
  - Test subjects (indicate if you do wish to utilize time during research class period(s) to perform your experiment, hand out surveys, etc. and estimate amount of time needed)
  - Questionnaires/surveys (you must create and include with this proposal, google forms are useful for collecting data by asking questions because it organizes the responses into a spreadsheet for you while paper based surveys will require you to perform data entry onto a spreadsheet)
  - Anything else your specific research investigation will need

**Part 4 – Procedures** (paragraph form or sequenced list)

- Write out a detailed set of orderly procedures you plan to follow when conducting this experiment.
- Include a component addressing safety and ethical concerns.

**Part 5 – Bibliography**

Use proper APA format to list each of the 3 articles you found and journaled (6 if partnered) as well as any other sources you found and referenced for information on your topic.

The resource [www.citationmachine.net](http://www.citationmachine.net) can help you with appropriate formatting.

If you found your articles from the ProQuest database, a citation is often included at the end or you may view the article in ProQuest and on the right menu click “Cite” to copy and paste the citation into your bibliography.

**You may only begin your investigation AFTER your proposal is approved by your teacher.**