The Research Report

[**Abstract**](http://member.societyforscience.org/document.doc?id=24)

**Introduction**

The introduction sets the scene for your report. The introduction includes the purpose, your hypothesis, problem or engineering goals, an explanation of what prompted your research, and what you hoped to achieve.

* What knowledge exists? This requires extensive research.
* What experiments/experimenters have produced this knowledge?
* What is unknown?
* Are there competing/conflicting hypotheses?
* Aim of the study?
* What did you ask?
* What did you test?

**Problem Statement**

**Hypothesis**

* “If (cause)… then (effect)… because (based on your research)….”
* Substantiated by research
* Make falsifiable predictions that uses quantitative/empirical evidence to draw conclusions

**Purpose**

* “To analyze blah blah blah…”
* “To demonstrate blah blah blah…”
* “To determine blah blah blah…”
* “To establish blah blah blah…”
* “To evaluate blah blah blah…”
* “To measure blah blah blah…”

**Materials**

* Bulleted list
* Quantify where possible

**Procedures**

* Bullet or paragraph form
* Descriptive but succinct (do not be overly verbose)
* Location
* How were measurements taken?
* What type of analysis was used?
* [Typically in 3rd person passive](http://guides.lib.purdue.edu/content.php?pid=232776&sid=1925925) (subject receives action)
	+ 200mL of distilled water was poured into a 500mL beaker
* In the article provided as a sample:
	+ If categorizing, what were the criteria an object had to satisfy to be placed in a particular group?
	+ How accurate was your method of categorization? The authors explain that some individuals were dissected and their gonads inspected. It was calculated that their method of sexing the fish by visual inspection was 96% accurate. **This informs the reader that your experiment rests on a solid foundation. A faulty foundation will cause the experiment/data/conclusions to crumble during the peer-evaluation (or judging) process.**

**Data**

* Tables and graphs (including measures of central tendency, standard deviations and error)

**Analysis/Discussion**

* This is the essence of your paper. Compare your results with theoretical values, published data, commonly held beliefs, and/or expected results. Include a discussion of possible errors. How did the data vary between repeated observations of similar events? How were your results affected by uncontrolled events? What would you do differently if you repeated this project? What other experiments should be conducted?

**Conclusion**

* Briefly summarize your results. State your findings in relationships of one variable with the other. Support those statements with empirical data (one average compared to the other average, for example). Be specific, do not generalize. Never introduce anything in the conclusion that has not already been discussed. Also mention practical applications. You should always credit those who have assisted you, including individuals, businesses and educational or research institutions. However, acknowledgements listed on a project board are a violation of the D & S Display rules and must be removed.

**References/Bibliography**

* Your referfence list should include any documentation that is not your own (i.e. books, journal articles, websites, etc.). See an appropriate reference in your discipline for format or refer to the Instructions to Authors of the appropriate publication. Three common reference styles are:
	+ APA
		- <http://www.apastyle.org/>
		- <https://www.calvin.edu/library/knightcite/index.php?standard=APA>
		- <https://owl.english.purdue.edu/owl/resource/560/01/>
	+ MLA
		- <http://www.mla.org/style>
		- <http://www.calvin.edu/library/knightcite/index.php>
		- <https://owl.english.purdue.edu/owl/section/2/11/>
	+ Chicago Manual of Style
		- <http://www.chicagomanualofstyle.org/home.html>
		- <http://www.calvin.edu/library/knightcite/index.php>

Author, A. A., & Author, B. B. (Date). Title of article. *Title of Online Periodical, Volume*(Issue). Retrieved from <http://www.someaddress.com/full/url> or doi: 10.1108/03090560710821161

Citation from ScienceDaily

University of Missouri School of Medicine. (2013, March 21). Discovery could increase efficacy of promising cystic fibrosis drug. ScienceDaily. Retrieved February 27, 2014 from [www.sciencedaily.com/releases/2013/03/130321151554.htm](http://www.sciencedaily.com/releases/2013/03/130321151554.htm)

Citation from peer-reviewed article

Jih, K.-Y., & Hwang, T.-C. (2013). Vx-770 potentiates CFTR function by promoting decoupling between the gating cycle and ATP hydrolysis cycle. *Proceeding of the National Academy of Sciences, 110*(11), 4404-4409. doi: 10.1073/pnas.1215982110

\*If you are having trouble indenting (for example, when you press *Tab*, the entire citation indents), click on the *Home* tab. In the *Paragraph* group, click on the arrow at the bottom right corner of the *Paragraph* group. Under *Indentation*, select **Special > Hanging**. Alternatively, press **Control + T**.

\*Journal articles without a DOI require the URL of the journal home page

Example

**Introduction**

Elucidation of the mechanisms involved in energy coupling with respect to the dysfunctional CFTR protein in mutation R352 has allowed researchers to explore modifying the drug Kalydeco to further increase its effectiveness in treating patients with the genetic disorder1.

or…

Elucidation of the mechanisms involved in energy coupling with respect to the dysfunctional CFTR protein in mutation R352 has allowed researchers to explore modifying the drug Kalydeco to further increase its effectiveness in treating patients with the genetic disorder [1].

**References**

1. University of Missouri School of Medicine. (2013, March 21). Discovery could increase efficacy of promising cystic fibrosis drug. ScienceDaily. Retrieved February 27, 2014 from [www.sciencedaily.com/releases/2013/03/130321151554.htm](http://www.sciencedaily.com/releases/2013/03/130321151554.htm)

Display Board

* Must include:
	+ Problem statement
	+ Hypothesis
	+ Purpose
	+ Materials
	+ Procedures
	+ Graphs/ Photographs
	+ Data Analysis
	+ Conclusion
* Optional:
	+ Background
	+ Introduction
	+ Variables
	+ Diagrams
* Links:
	+ Discovery Education: <https://school.discoveryeducation.com/sciencefaircentral/Science-Fair-Presentations/How-to-Create-a-Winning-Science-Fair-Display-Board.html>
	+ ISEF backboard design tips: <http://www.docstoc.com/docs/104570629/Tips-on-Designing-an-ISEF-Affiliated-Science-Fair>