A Comprehensive Look at Science Projects

 By now, you are probably relieved that this will no longer be entered in the science fair. That being said, it is imperative that you prepare this as if it were going to be entered and judged. This is the most comprehensive explanation of your project that you will ever receive. More importantly, I have included the rubrics for how it is going to be scored in class. At this time, you have at LEAST three weeks to have a finished project. With the way shut downs are going nationwide, do not be surprised if you have more. Sit back, relax, and enjoy the process of giving me my best projects I have ever seen!

**Title Page**

 Very simple here. Standard title page (you can use a template). Because it is not being entered in the fair, you are now able to include your name, my name, and class period on the paper. For the sake of fun, just date this page April 6. Certainly not the most challenging aspect. Title page is worth 5 points on the rubric.

**Table of Contents**

 Another simple aspect of the paper. Be sure to start numbering the report AFTER this page. Meaning, introductions should be on page 1. This part of the paper must be done AFTER YOU HAVE TYPED YOUR REPORT FOR OBVIOUS REASONS!!!!!!! This is another 5 point portion of the paper.

**Introduction**

 Without a doubt, this is the most important aspect of a science project. It is vital that you lay the groundwork, introduce the reader to previous studies, and set up the remainder of the paper. For my honors students, I am looking for at LEAST five sources (honors…3 nonhonors) that are cited IN TEXT during this part of the paper. We are using APA formatting, and this can easily be done within Word to create a perfect works cited portion at the conclusion of the paper. Here is an example of citation using Kenlee Bonecutter’s tweet about me:

*The coronavirus outbreak is not surprising to students who have taken Mr. Tench, as he predicted the world was long overdue for another plague (Bonecutter, 2020).*

Now, if you were to read the tweet, that is not EXACTLY what she said. This is because I took her information, reworded it to fit my vernacular, and then entered in to my report. I simply clicked “References”, made sure the format was APA, and then clicked “Insert Citation”. Done and done.

On top of these citations, it is important that you find background information for your experiment, relevance to the real world, and if you can, previous experiments (search Google’s scholarly articles and read the abstracts to see if their reports are similar to yours).

Finally, at the end of all of the background information, briefly set up the experiment and state your hypothesis. Hypothesis format has multiple avenues, such as if/then statements, but ultimately are STATED AS FACTS! You do not think, you do not believe, you do not hope. These are always factual. When in doubt, use the null hypothesis.

Here is the rubric portion for this part:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 20 | 14 | 7 | 1 |
| Introduction | The introduction gives background information about the experiment, including definitions, previous work, and 3 (non-honors) or 5 (honors) in text citations. Hypothesis is clearly stated. | The introduction gives background information about the experiment, including definitions, previous work, but lacks 3/5 in text citations. Hypothesis is clearly stated. | The introduction does not clearly define experiment, lacks in text citations, and hypothesis is unclear. | No evidence. |

**Procedure**

This portion is simply the procedure of the experiment. This will be probably the easiest part of the report, as you simply tell me what you have done. A few key points I need you to remember:

* This is bulleted. Do not number the procedure for the simple fact it is not aesthetically pleasing.
* Phrases are short, more like commands. DO NOT write in complete sentences.
* Treat the reader as a scientist. Do not OVER simplify the instructions, as it appears you are talking down to them.

Recall, for a lab to be even DECENT I am going to need at least 5 trials. For those than can get 100’s of data points, do that. No sense in putting all of this work in for a faulty lab design.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 15 | 10 | 5 | 1 |
| Procedure | The procedure breaks down a minimum of 5 trials with bullet points, short phrases, and is clear and concise. | The procedure breaks down 3-4 trials with bullet points, short phrases, and is clear and concise. | The procedure breaks down less than three trials, uses short phrases, and is somewhat vague. | No evidence. |

**Data**

 This is another simple aspect of the report. I would be surprised if someone could not represent their data visually. This portion is where we simply insert our charts and graphs. It is important to label the charts and graphs so they correspond with one another, which makes the effort easier for the reader. For example:

Chart A should go with Graph A

Chart B should go with Graph B

Etc.

Etc.

 If you have issues with charts and graphs, this is where you need to contact me. I am making myself pretty available for all students. A reminder will be at the end of this, but I’ll put it here as well:

dtench@k12.wv.us

 Take. Advantage.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 10 | 5 | 3 | 1 |
| Data | Data is represented in charts and graphs that correspond to one another. | Data is represented in charts and graphs, but they do not correspond with one another. | Data is no accurately represented and charts and graphs do not correspond with one another. | No evidence. |

**Results**

 This is another major portion of the report (you’ll notice the more important aspects are weighted). This is your chance to DISCUSS THE DATA!!!! If everything went as planned, discuss. If trials gave you crazy data points, discuss. If most of the data fit a trend, but one did not…discuss. If the data creates a very predictable pattern for the future, discuss. This is your opportunity to dive in to the material and give insight to methods, accuracy, etc. This is where you refer to your charts and graphs…for example:

*As one can see from Chart A, trial four behaved differently than the rest of the data. This is better illustrated in Graph A, as the anomaly clearly does not fit the rest of the data points.*

 Simply discuss what happened. DO NOT CONCLUDE!!!!! That is next!

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 20 | 14 | 7 | 1 |
| Results | Data is thoroughly discussed in all aspects. Trials that were anomalies were addressed, accuracy issues were addressed, and any other important information is discussed. | Data is somewhat discussed. Trials, accuracy, and important information was left vague. | Data was not addressed thoroughly. There was no mention of trials, accuracy, and any other important information. | No evidence. |

**Conclusion**

 Finally, the conclusion. This is not too bad, as it is simply you making your final verdict, why you did, and how this can become better. To begin with, restate the hypothesis and determine if it was or was not supported. Then, address the issues that arose. Perhaps your experimental design was flawed, you had not accurate way of measuring the data, or simply you made mistakes. This is the time to be honest about the work, and this section shows how well you understood your information. Generally, the better the research, the better the conclusion.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 20 | 14 | 7 | 1 |
| Conclusion | Conclusion restates the hypothesis, determines if experiment supported or did not support hypothesis, suggests errors, and suggests improvements. | Conclusion restates the hypothesis, does not determine if the experiment supported or did not support hypothesis, omits errors OR improvements.  | Conclusion does not restate hypothesis, no mention of support, and omits errors OR improvements.  | No evidence. |

**Work cited**

 Easy part! After you’ve inserted your citations in the introduction, Word will build this for you. Simply click on “References”, “Bibliography”, and pick the format you want. I do not care. It is 5 points. Back to Bonecutter…

# Bibliography

Bonecutter, K. (2020, March 13). *Social Media*. Retrieved from Twitter.

**Presentation**

 Now that the report is done, let’s move on to the presentation. To make this simple, I have included the rubric. The following page will be your PROJECT SCORE!!! I am simply going to use the science fair score sheet to accomplish this. This is how you will receive your 300 points for the assignment. So, to recap, you’ll have the rubric for the report, rubric for the presentation, and rubric for the project itself. I am going to be nice and NOT REQUIRE AN ABSTRACT. They are not bad, but it’s just less paperwork for me. So, without further ado, here are your requirements! **ALSO, THE VISUAL NO LONGER HAS TO BE A BOARD!!!!!!!!!!!! YOU ARE ABLE TO MAKE A POWERPOINT AND STILL RECEIVE FULL CREDIT!!!!!!!!!!!!!!!!!!!!!!!!!!!!**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 20 | 14 | 7 | 1 |
| Duration | Presentation was between 2-5 minutes. | Presentation was short/long 15 seconds. | Presentation was short/long 30 seconds. | Presentation was short/long 1 minute. |
| Disfluencies | HONORS: 6 or less disfluenciesNon- 8 or less disfluencies | 7-10 disfluencies9-12 disfluencies | 11-15 disfluencies13-17 disfluencies | 16+18+ |
| Visual | Visual clearly represents the information. | Visual somewhat represents the information. | Visual is disorganized and does not represent information. | No visual. |
| Scientific Method | All aspects of the scientific method are covered. | All but 1 aspects of the scientific method are covered. | 2-4 aspects of scientific method are not covered. | None of the scientific method is covered. |
| Questions | Student able to answer all questions about the project. | Student unable to answer 1 question about the project. | Student unable to answer 2-4 aspects about the project. | Student unable to answer any questions about the topic. |

**Project rubric**

 We are simply going to follow the judge’s scoresheet for this part. Take a look at it, understand what I am looking for, and be ready to do your best upon our return!

(ON NEXT PAGE!)

|  |  |  |
| --- | --- | --- |
| Criteria | Maximum Score | Student Score |
| **Creative Ability**1. Project shows creative ability and originality in the following areas:
* Questions asked
* Approach to solving the problem
* Analysis of the data
* Interpretation of the data
* Use of equipment and/or construction/design of new equipment
1. Creative research supports an investigation and answers questions in an original way
2. A creative contribution that promotes an efficient and reliable method for solving a problem
 | **20****5****5** |  |
| **Scientific Thought**1. The problem is:
* Stated clearly and unambiguously
* Sufficiently limited to allow plausible approach
1. There is a procedural plan of obtaining a solution.
2. Variables are clearly recognized and defined.
3. If controls were necessary, the student recognized the need and used them correctly.
4. There is adequate data to support the conclusions (review written research paper).
5. The student recognizes the data’s limitations.
6. The student understands ties to related research.
 | **5****10****10****5** |  |
| **Thoroughness**1. Purpose was carried out to completion
2. Problem was completely covered
3. Conclusions based on more than one experiment
4. Project notes and sufficient amount of time spent on project.
5. The student is familiar with related scientific literature.
 | **15** |  |
| **Clarity**1. The student can clearly discuss his/her project and explain the purpose, procedure, and conclusions.
2. Written materials reflect the student’s understanding of the research.
3. Important phases of the project are presented in an orderly manner.
4. Data and results are clearly presented.
5. Project display clearly explains the project.
 | **15****10** |  |
| **Total Score** | **100** |  |
| **Comments/Suggestions** |  |  |