Dear Students and Parents,
We will have our Annual Science Fair this year open to all students. Enclosed is a schedule outlining due dates and important information regarding your project. Ample time has been scheduled and work has been spread out, so students can complete the work at a comfortable pace. ***FINAL TRIFOLD BOARD IS DUE on December 3rd, 2019****.*

This is a major project and will represent a ***significant portion*** *of your child's grade for this and the next grading period(s). They will* ***receive four daily grades*** *and* ***one test grade*** *overall. The primary objective of this project is to have students approach a problem scientifically. This includes:*

- ✓ *Asking research questions and forming hypothesis*
- ✓ *Creating and designing experiments to test those hypothesis*
- ✓ *Data Collection and Organizing data*
- ✓ *Analysis and Interpretation of data*
- ✓ *Drawing Conclusions*

The project must be ***experimental*** *in nature as opposed to research oriented. In other words, students must do a test, survey, or experiment to determine the answer to their question instead of just looking it up in a book. We encourage students to pick topics that they are genuinely interested in.* ***Topics must be chosen from the Categories and Sub-Categories provided by the Georgia Science and Engineering Fair guidelines.*** *Please visit the link below to access more information.*

https://www.georgiacenter.uga.edu/sites/default/files/gsef-2020-exhibitor-handbook.pdf*.*

*Research question must be "****original****" - something students do not already know. Project guidelines state that all work must be done by the students; however, assistance may be provided by teachers, parents, etc. It is very difficult to work alone without the exchange of ideas, so we encourage you to brainstorm with your child on different ideas and possible topics your child may want to pursue. Please take a moment to review all the attachments with your child in order to generate topic ideas.* ***Keep a copy of every checkpoint to guide you to the next step.***

I am looking forward to working with you and making this a valuable learning experience. I appreciate your support on this important project.

Timeline for Science Fair Project

Checkpoint # 1

Due Date	What's Due	Points Earned	Points Possible
September 25th, 2019	**Research Question (Hypothesis) and background Information** • clear and focused purpose • identifies contribution to field of study • testable using scientific methods		100 (Daily Grade)
Beginning (0-69)	**Developing (70-79)**	**Proficient (80-89)**	**Distinguished (90-100)**
Hypothesis is clearly written but may not be testable. Question is either too simple (or too complicated) to be tested.	Hypothesis is clearly written and testable. Hypothesis and experiment can be performed in a controlled environment. Question is unique and reflects individual interest.	Hypothesis is clearly written and testable. Hypothesis and experiment can be performed in a controlled environment. Question is unique and reflects individual interest.	Hypothesis is clearly written and testable. Hypothesis and experiment can be performed in a controlled environment. Question seeks an in-depth explanation of a specific subject.
Background information does not meet the three paragraphs and 1-page minimum. Sources are not cited or incorrectly cited. Text is poorly written with many grammar and punctuation errors. Revision required.	Background information meets the three paragraphs and 1-page minimum and uses 3 sources. Text is poorly written with some grammar and punctuation errors. Sources are incorrectly cited. Revision required.	Background information goes beyond the three paragraphs and 1-page minimum and uses 3 sources. Information reflects deep understanding of project goals and clearly shows the value of the outcome. There are minimal grammar and/or punctuation errors. Sources are correctly cited.	Background information goes beyond the three paragraphs and 1-page minimum and uses more than 3 sources. Information reflects deep understanding of related topics to the project and can compare and contrast similar research to the project. There are no grammar or punctuation errors. Sources are correctly cited in APA format.

Checkpoint # 2

Due Date	What's Due	Points Earned	Points Possible
October 15th, 2019	Design of the experiment (Procedure) and Methodology with materials needed • well-designed plan and data collection methods • variables and controls defined, appropriate and complete		100 (Daily Grade)
Beginning (0-69)	**Developing (70-79)**	**Proficient (80-89)**	**Distinguished (90-100)**
Materials list is missing details, unobtainable or does not fully match procedure. Experiment does not answer question or test hypothesis. Procedure may not be detailed enough to be reproducible. Formatting needs work.	Materials list is thorough. Materials list matches procedure. Materials are obtainable. Experiment answers question and adequately tests hypothesis. Procedure is reproducible but with questions. Formatting needs work.	Materials list is thorough and includes measurements. Materials list matches procedure. Materials are obtainable. Experiment answers question and adequately tests hypothesis. Procedure is reproducible, without questions. Formatting is followed in both materials list and procedure.	Materials list is thorough and includes measurements. Materials list matches procedure. Materials are obtainable. Experiment answers question and adequately tests hypothesis. Procedure is reproducible, without questions. Formatting is followed in both materials list and procedure.

Checkpoint # 3

Due Date	What's Due	Points Earned	Points Possible
November 1st, 2019	Data Collection with supporting pictures throughout the experiment • systematic data collection and reproducibility of results • appropriate application of mathematical and statistical methods • sufficient data collected to support interpretation and conclusions		100 (Daily Grade)
Beginning (0-69)	**Developing (70-79)**	**Proficient (80-89)**	**Distinguished (90-100)**
Either qualitative or quantitative data are missing. Progressive photos are inadequate or missing. Data table(s) accurately records quantitative data with units and includes title(s).	Both qualitative and quantitative data are included. Progressive photos are present but may not be clear or labeled. Data table(s) accurately records quantitative data with units and includes title(s).	Both qualitative and quantitative data are included. Progressive photos represent clear understanding of how experiment progressed and are properly labeled. Data table(s) accurately records quantitative data with units and includes title(s). and procedure.	Both qualitative and quantitative data are included. Progressive photos represent clear understanding of how experiment progressed and are properly labeled. Data table(s) accurately records quantitative data with units and includes title(s). Data is easy to follow. Graphs and/or charts are used as an alternate visual presentation of data. Graphs and/or charts are clearly labeled.

Checkpoint # 4

Due Date	What's Due	Points Earned	Points Possible
November 15th, 2019	Analysis and Interpretation • reproducibility of results • conclusions		100 (Daily Grade)
Beginning (0-69)	**Developing (70-79)**	**Proficient (80-89)**	**Distinguished (90-100)**
Analysis discusses findings of either experimental qualitative or quantitative data. Analysis explains data in words. Write up is riddled with punctuation or grammatical. Conclusion write up summarizes data.	Analysis discusses findings of experimental qualitative and quantitative data. Analysis write up includes correct references to data tables/graphs/charts. There is moderate punctuation or grammatical errors. Conclusion write up interprets qualitative and quantitative data.	Analysis details findings of experimental qualitative and quantitative data. Analysis write up includes correct references to data tables/graphs/charts. There is some punctuation or grammatical errors in the write up. Conclusion write up interprets qualitative and quantitative data. Conclusion discusses possible sources of error. Conclusion describes the science behind the results.	Analysis details findings of experimental qualitative and quantitative data. Analysis write up includes correct references to data tables/graphs/charts. There is no punctuation or grammatical errors in the write up. Conclusion write up interprets qualitative and quantitative data. Conclusion discusses possible sources of error. Conclusion ties in previous research discussed in the background. Conclusion describes the science behind the results and discusses further questions on research after completing this project.

Checkpoint # 5

Due Date	What's Due	Points Earned	Points Possible
December 3rd, 2019	*Final trifold Board*		100 (Test Grade)
Beginning (0-69)	**Developing (70-79)**	**Proficient (80-89)**	**Distinguished (90-100)**

Part I (100 points- Daily Grade)

Research Question(s)

1._____

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Hypothesis:

1._____

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Background Information (About a page)

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Part II (100 points Daily Grade)

Experiment: Create, design, and conduct your experiment.

An example of a biology project that is simple to complete either at home or in the science classroom involves growing two same-species plant seeds in wet and dry conditions. Use this experiment to demonstrate that seeds need moisture to germinate. Pour a teaspoon of cress seeds onto the center of two identical paper towels and spread tap water onto one of the towels --- this leaves you with a dry and wet condition for your seeds. Wrap the paper towels so you have covered over the seeds and position them where they will receive plenty of natural light. Return to observe the growth in your seeds at least once every other day, providing the wet condition towel with water when necessary. Take plenty of photographs of your experiment, which you can show on your science fair display before ending.

Materials

Materials	Use	Location	Cost

Part III (100pts Daily Grade)

Data Collections: Develop and design charts, graphs and/or tables relating to the results of your Science Project.

DATA TABLE

Wing length of a twirly	Trial 1	Trial 2	Trial 3	Average time it took for twirly to drop.
4 cm	10 sec	8 sec	7 sec	8.3 sec
6 cm	12 sec	11 sec	13 sec	12 sec
8 cm	15 sec	17 sec	14 sec	15.3 sec

Pictures: Take plenty of photographs of your experiment, which you can show on your science fair display before ending.

Part IV (100pts Daily Grade)

Analyzing Data: Review your data and compare it the hypothesis. Make sure to check for spelling and accuracy

- **Review** your data. Try to look at the results of your experiment with a critical eye. Ask yourself these questions:
    - Is it complete, or did you forget something?
    - Do you need to collect more data?
    - Did you make any mistakes?
- **Calculate an average** for the different trials of your experiment, if appropriate.
- **Make sure to clearly label** all tables and graphs. And, include the **units of measurement** (volts, inches, grams, etc.).

Research Paper

The purpose of your **research paper** is to give you the information to understand why your experiment turns out the way it does. The research paper should include:

- The **history** of similar experiments or inventions
- **Definitions of all important words and concepts that describe your experiment**
- **Answers to all your background research plan** questions
- Mathematical formulas, if any, that you will need to describe the results of your experiment

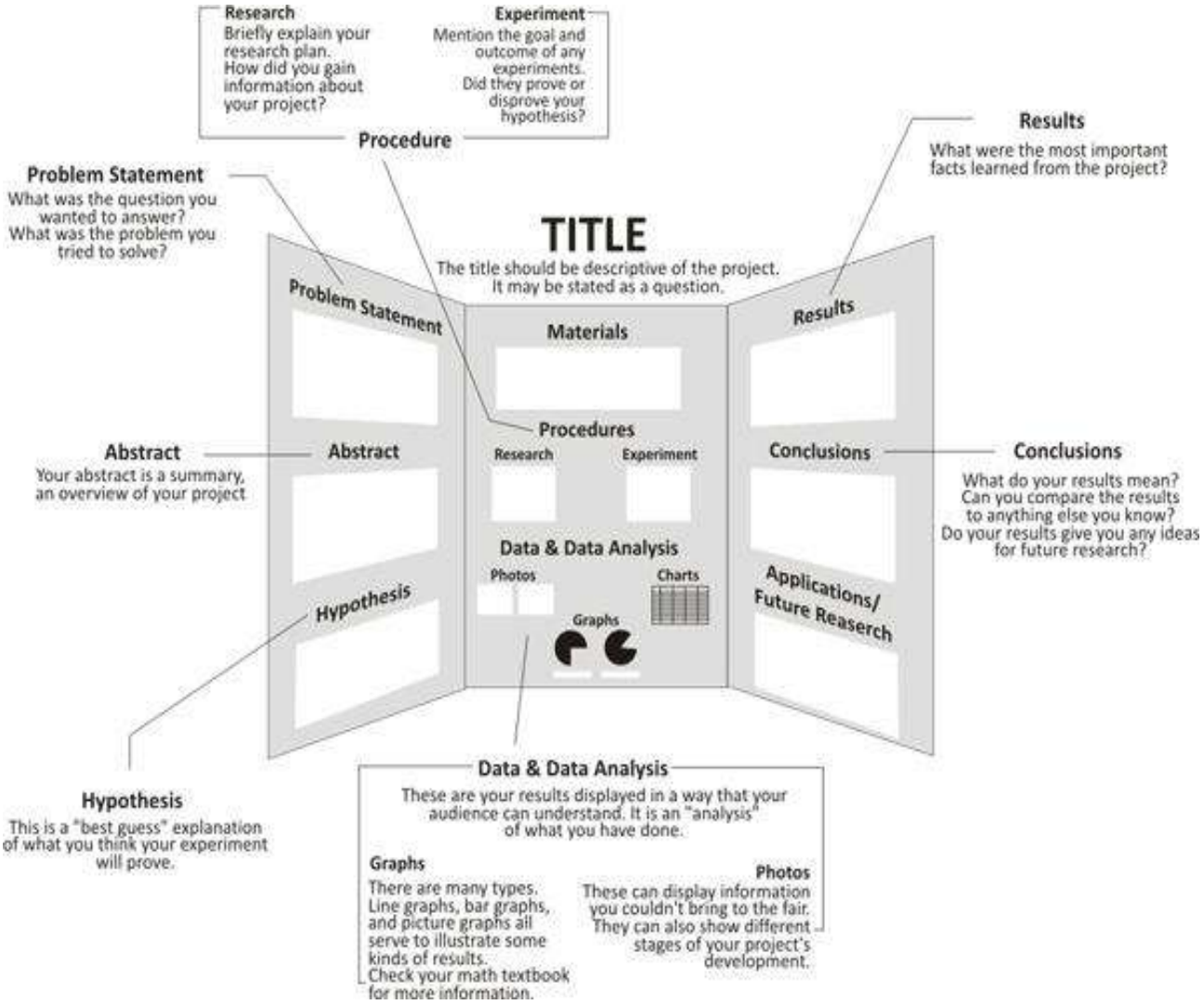
For every fact or picture in your research paper you should follow it with a citation telling the reader where you found the information. A citation is just the name of the author and the date of the publication placed in parentheses like this: (Author, date). This is called a reference citation when using APA format and parenthetical reference when using the MLA format. Its purpose is to document a source briefly, clearly, and accurately.

If you copy text from one of your sources, then place it in quotation marks in addition to following it with a citation. Be sure you understand **and avoid plagiarism**! Do not copy another person's work and call it your own. Always give credit where credit is due!

Part V-Display (100pts TEST Grade)

Models and pictures: Visual display of your science research project

Display Boards: Look at the illustration below. Make labels, design patterns, and templates for each section.



Science Fair Presentation

Science Fair Oral Presentation Rubric

Student Name: _____

CATEGORY	10	7	4	1
Content	Student shows a full understanding of the scientific method and describes their experiment with details.	Student shows a good understanding of the scientific method and/or describes their experiment well.	Student shows a good understanding of parts of the scientific experiment and/or describes their experiment some.	Student does not seem to understand the scientific method very well and/or gives little information about their project.
Time-Limit	Presentation is 4 minutes long.	Presentation is 3 minutes long.	Presentation is 2 minutes long.	Presentation is less than 2 minutes OR more than 4 minutes.
Posture and Eye Contact	Student stands up straight, looks relaxed and confident. Establishes eye contact with everyone in the room during the presentation.	Student stands up straight and establishes eye contact with everyone in the room during the presentation.	Student sometimes stands up straight and does not always establish eye contact with everyone in the room during the presentation.	Student slouches and/or does not look at people during the presentation.
Speaks Clearly	Student speaks clearly all of the time, and has good volume.	Student speaks clearly all of the time and/or is hard to hear at times.	Student speaks clearly most of the time and/or is hard to hear.	Student often mumbles or cannot be understood.
Presentation Order and Relevance	Entire presentation relates to the scientific method/experiment and their presentation follows the proper sequential order.	Most of the presentation relates to the scientific method/experiment and/or order of presentation is not in proper sequence.	Little of the presentation relates to the scientific method/experiment and/or the order of the presentation is jumbled.	Very little of the presentation relates to the scientific method/experiment and/or no order is evident.