**Collingwood Science Expo 2012-2013**

**Science 8**

***What is different this year?***

* **Larger group size:** Each group will be composed of 3-4 students. Collaboration between all members of the group is necessary for a successful project. Use each other’s knowledge and skills to be creative, resourceful and well-organized.
* **Themed:** This year’s project will have a theme so that all groups will have a starting point from which they will formulate their project ideas. The theme will be very general and can be interpreted in a vast number of ways. Be creative!
* **No boards:** Instead of using boards to display our science project, we will be uploading all of our information onto our weebly pages (details to follow). This will allow us to use more multi-media, as well as provide a more permanent platform to preserve our work.
* **In-class:** We will be providing you with more class time in which to work on your project. There will be exceptions where some tasks may need to be done outside of school, however, we are encouraging groups to do **MOST** of their work while at school.
* **Condensed time:** Although you will be given more class time**,** the overall time period you will have to work on your project will not be as much as in past years. This needs to be taken into consideration when you are choosing your topic (for example: plant growth may not be as practical as before).

**Project Category**

* **Water**: This project should deal with any Science topic that consists of water in one form or another. All areas of Science (Chemistry, Physics, Biology and Earth Science) have water that encompasses that area and its subsidiaries. This can include such topics as, water as a renewable energy source, distilling or desalinating water, refraction in water, how boiling point and freezing point of water can be affected different substances, how different sources of water affect the growth of living things (ie. plants) and many more…

**Type of Project**

Science projects may be **one** of two types:

* **Experiment:** An investigation undertaken to test a specific hypothesis using experiments.

Experimental variables, if identified, are controlled as far as possible.

* **Innovation / Invention:** The development and evaluation of innovative devices, models or

techniques or approaches in technology, engineering, or computers (hardware/software).

**Experiment:**

A more traditional science expo project is based on scientific inquiry, the formal experimentation process and presentation. A critical part of any scientific project is to record your results and conclusions properly. This section outlines the important steps for you and your project. A science expo project requires the following written materials, displayed **in this order** on your weebly.

**All sections to be included on your weebly**

#### Title: A catchy phrase that entices your audience

* **Introduction and Purpose**: An explanation of what prompted your research and what you hoped to achieve. Your topic should have background research completed at this point, from credible sources, as this will add a platform to your discussion. Your last statement should involve a sentence as to what you will be investigating.
* **Hypothesis:** Write a formal hypothesis that explains the predicted result of the Experiment or (does the “Investigation” line need to be brought up?)

Investigation. Identify the independent variable, dependent variable and controlled variables.

* **Materials and Apparatus:** Provide a comprehensive list. Include the quantity or amount of each material.
* **Procedure**: As a list of steps, describe in clear detail the methodology used to collect data or make your observations/discoveries. Include enough information for someone to repeat the experiment or invention. Include detailed photographs or drawings.
  + **Video**: A video will be taken as you preform the experiment. This must include gathering the materials, performing the experiment and the conclusion of your results. Your reader will not be present while the experiment is being completed; this gives the reader a more hands-on experience of your experiment.
* **Results: You results section should include 4 of following below.** Present honest and clear results. **Tables** and **graphs** should be used wherever possible.

Include **analysis** of your qualitative and quantitative data, any errors and statistical analysis where applicable.

* + **Table and Graphs**: You should include any important Tables that will enhance your presentation value coupled with Graphs of the appropriate type so the reader is given a visual representation for your results. All Tables should be labelled Table 1, and Graphs should be labelled Figure 1.

(con’t next page)

* **Discussion**: Thoroughly discuss exactly what you did in your project. Your results should be

compared with theoretical values, published data, commonly held beliefs and/or expected results. A discussion of possible errors should be included as well as how the data varied between repeated observations, how your results were affected by uncontrolled events, what you would do differently if you repeated the project, and what other experiments should be conducted. Your research work must be included in this section. (Check Index)

* **Conclusion**: A summary of your results relating them to your hypothesis. Refer to the results of your experiment in the formulation of your conclusion.
* **References**: List all references in APA format (using NoodleTools). References must be varied and not only from the internet (i.e. books, journals, articles).
* **Any Acknowledgements**: Credit individuals, businesses and educational or research institutions

which assisted you. Identify financial support or in-kind donations.

The Science Fair Foundation of BC has an alumni mentorship program. If you are interested in applying for a mentor, go to the website <http://www.sciencefairs.bc.ca/mentorship.html>

* **Project Journal/Data Booklet**: A project journal/data booklet should contain accurate and detailednotes,research,journal of your work including data and observations, to demonstrate consistency andthoroughness the project process. This is to be organized in a **duo-tang** and handed in with the completed project.

# Innovation/Invention:

This type of project is an alternative to a traditional science project. At the core of this component is the students’ ability to recognize a problem or short coming within our society current use of a technology or any common use or application of an apparatus/material. The theme of water is still to be used for this type of project.

The goal:

1. to design and build an improved or more efficient alternative of an existing structure.

and/or

1. to invent a new method/apparatus to address a short coming within our everyday lives or society.

For example:

* The use of water as a renewable energy source.
* The improved process of production of clean water (filtration or desalination).
* A new or improved gadget or appliance that uses water to enhance our lives in the home/community.
* A process or device to improve the environmental water quality within an ecosystem.
* A product, process, or system involving water to enhance our health and lifestyle.

**Innovation/Invention:**

**All sections to be included on your weebly**

1. **Proposal:**

* a written paper (min. 500 words) that clearly identifies the problem and need for your invention/innovation.

**2. Design Process:**

* list materials needed and how to acquire them
* discuss the construction process in a clear and sequential manner
* use diagrams/blueprint to help visualize the design

**3. Testing/Results:**

* a clear and valid testing process is needed to evaluate the invention/innovation
* results should be presented in a logical and usable format (i.e. – graph, table, etc.)

**4. Evaluation and Reflection:**

* a reference to the results is made to qualify and clarify the efficiency of the invention
* can the invention be improved?
* is the final product successful? Does it fulfill its original goal?

**5. Project Journal/Data Booklet**: A project journal/data booklet should contain accurate and

detailednotes,research,journal of your work including data and observations, to demonstrate consistency andthoroughness during the project process. This is to be organized in a **duo-tang** and handed in with the completed project.

**Experiment Deadlines/Checklist:**

**Part 1– PROPOSAL** (See attached “*Science Expo Proposal for Experiment*” sheet)

* **Explore Week 1: Due Fri. Dec. 14th**
* **Explore Week 2: Due Fri. Dec. 7th**
* **Explore Week 3: Due Fri. Dec. 7th**
* **Explore Week 4: Due Fri. Dec. 7th**

**Part 2– INTRODUCTION/PURPOSE & HYPOTHESIS**

* **Explore Week 1: Due Wed. Dec. 19th**
* **Explore Week 2: Due Wed. Dec. 19th**
* **Explore Week 3: Due Wed. Dec. 12th**
* **Explore Week 4: Due Wed. Dec. 12th**

**Part 3–MATERIALS & PROCEDURE**

* **Explore Week 1: Due Wed. Dec. 19th**
* **Explore Week 2: Due Wed. Dec. 19th**
* **Explore Week 3: Due Wed. Dec. 19th**
* **Explore Week 4: Due Wed. Dec. 19th**

**Part 4 – EXPERIMENT COMPLETED**

* **Explore Week 1: Due Fri. Jan. 18th**
* **Explore Week 2: Due Fri. Jan. 18th**
* **Explore Week 3: Due Fri. Jan.25th**
* **Explore Week 4: Due Fri. Jan. 18th**

**Part 5 – DATA/OBSERVATIONS/RESULTS**

* **Explore Week 1: Due Fri. Jan. 18th**
* **Explore Week 2: Due Fri. Jan. 18th**
* **Explore Week 3: Due Fri. Jan.25th**
* **Explore Week 4: Due Fri. Jan. 18th**

**Part 6 – DISCUSSION & CONCLUSION**

* **Explore Week 1: Due Fri. Jan. 25th**
* **Explore Week 2: Due Fri. Jan. 25th**
* **Explore Week 3: Due Fri. Jan. 25th**
* **Explore Week 4: Due Feb. 1st**

**\*\*Complete Science Expo Project on your Weebly:**

* **due THURSDAY January 31ST/FRIDAY FEBRUARY 1ST, 2013**

**\*\*Presentations – Week of February 4th to 8th.**

**Innovation/Invention Deadlines/Checklist:**

**Part 1– PROPOSAL** (See attached “*Science Expo Proposal for Innovation*” sheet)

* **Explore Week 1: Due Fri. Dec. 14th**
* **Explore Week 2: Due Fri. Dec. 7th**
* **Explore Week 3: Due Fri. Dec. 7th**
* **Explore Week 4: Due Fri. Dec. 7th**

**Part 2– DESIGN PROCESS**

* **Explore Week 1: Due Wed. Dec. 19th**
* **Explore Week 2: Due Wed. Dec. 19th**
* **Explore Week 3: Due Wed. Dec. 12th**
* **Explore Week 4: Due Wed. Dec. 12th**

**Part 3–DESIGN AND TESTING**

* **Explore Week 1: Due Wed. Dec. 19th**
* **Explore Week 2: Due Wed. Dec. 19th**
* **Explore Week 3: Due Wed. Dec. 19th**
* **Explore Week 4: Due Wed. Dec. 19th**

**Part 4 – TESTING COMPLETED**

* **Explore Week 1: Due Fri. Jan. 18th**
* **Explore Week 2: Due Fri. Jan. 18th**
* **Explore Week 3: Due Fri. Jan.25th**
* **Explore Week 4: Due Fri. Jan. 18th**

**Part 5 –RESULTS**

* **Explore Week 1: Due Fri. Jan. 18th**
* **Explore Week 2: Due Fri. Jan. 18th**
* **Explore Week 3: Due Fri. Jan.25th**
* **Explore Week 4: Due Fri. Jan. 18th**

**Part 6 – EVALUATION & REFLECTION**

* **Explore Week 1: Due Fri. Jan. 25th**
* **Explore Week 2: Due Fri. Jan. 25th**
* **Explore Week 3: Due Fri. Jan. 25th**
* **Explore Week 4: Due Feb. 1st**

**\*\*Complete Science Expo Project on your Weebly:**

* **due THURSDAY January 31ST/FRIDAY FEBRUARY 1ST, 2013**

**\*\*Presentations – Week of February 4th to 8th.**

# The Collingwood Science Expo: February 5th, 2013

# \*\*All students are expected to be present and in #1 uniform.

# \*\* Students must be present at their projects and prepared to present them

# to visitors, parents and other students.

**Science Expo: Writing Discussions**

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**The four steps to success:**

Begin with:

1. **“In my hypothesis……….”**

* Was it correct or incorrect?
* Discuss your predictions compared to the outcome of your experiment.
* Include your background research here.

1. **Discussion of your procedures, variables and controls**

* Explain what you did and why.
* Convince the reader/marker that all the variables were considered, identified and controlled.
* Remember – if certain variables are overlooked or not properly controlled, it could invalidate the experiment.
* Review correct usage of terms: independent variable, dependent variable, and controlled variables.

1. **Discussion of your results**

* For example: explain a graph, diagrams, scientific principles, etc.
* The discussion should attempt, in detail, to explain the outcome of the experiment based upon data/results gathered during experimentation.
* Results compared with theoretical values or expected results.

1. **Reflection on experimentation**

* Was the experiment valid/successful?
* What would you change?
* Any problems identified? Possible sources of error?
* Extension: If you repeated the project, what else could you test?

**Collingwood Grade 8 Science Expo**

**Experiment Marking Sheet**

Group Members Names: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Part A: Scientific Thought (50 marks)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **3** | | **2** | | **1** | |
| **TITLE** | Informative, catchy | | Informative | | Just any title, not much thought | |
| **PURPOSE** | Format is correct. All present. | | All/ most present. | | Most are missing. | |
|  | **5** | | **3-4** | | **1-2** | |
| **HYPOTHESIS** | Correct format using “”If/Then” statement. Hypothesis is logical and makes a clear, testable prediction.  Variables are listed and accurate. | | Correct format using “”If/Then” statement. Hypothesis is logical and makes a clear, testable prediction.  Variables are listed. | | “”If/Then” statement is not entirely correct or not used/given.  A clear, testable situation may not be established. Variable are not listed. | |
| **MATERIALS** | Format is correct. All present. | | All/ most present. | | Most are missing. | |
| **PROCEDURE** | Format is correct. All present. | | All/ most present. | | Most are missing. | |
|  | **8-9** | | **5-7** | | **1-4** | |
| **DATA/**  **OBSERVATIONS/ RESULTS/ GRAPHS** | Data tables are accurate, neat, and complete. Graphs are correct and done by Excel. Each has an accurate title. | | Data tables are neat, and complete. Graphs are done by Excel. | | Data tables and/or graph are incomplete or missing. | |
|  | **9-10** | **6-8** | | **3-5** | | **1-2** | |
| **Discussion** | Discussion neatly and accurately explains the results above. Results are included. Detailed discussion is evident and four paragraphs are used. Critical thought is evident in application. | Conclusion explains the results above. Four paragraphs are used. Some critical thought is evident in application. | | Conclusion is stated but lacks detail. Two to three of the steps for success are addressed. Little critical thought evident. | | Conclusion is incomplete. The steps for success are not addressed. Little critical thought evident. | |
|  | **5** | | **3-4** | | **1-2** | | |
| **CONCLUSION** | Conclusion is a detailed summary of your results relating them to your hypotheses. Refer to the results of your experiment in the formulation of your conclusion. | | Conclusion is a summary of your results relating them to your hypotheses. Results may or may not be referred to. | | Conclusion is incomplete. Results are not referred to. | | |
| **References** | Two or more, variety of two or more types of reliable sources, proper APA format using Noodle Tools | | Two or more references, only internet sources, Proper APA format | | One reference | | |

**Part B: Originality/ Creativity (10 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **8-10** | **5-7** | **1-4** |
| **Creativity** | Imaginative to highly original project, good use of available resources, well thought out, creative in design and use of materials | Some creativity shown in project of fair to good design, standard approach using common resources or equipment , topic is common | Little imagination, project design simple with minimal input |

**Part C: Multimedia: Weebly (30 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **5** | **3-4** | **1-2** |
| **Necessary Scientific Skill Shown** | Scientific method displayed in proper order and easy to follow and understand: observations, hypothesis, prediction, materials, procedure, results, analysis, conclusion, discussion | Scientific method displayed in proper order: observations, hypothesis, prediction, materials, procedure, results, analysis, conclusion | No scientific method, some components of scientific method, all components of scientific method |
|  | **8-10** | **5-7** | **1-4** |
| **WEEBLY PRESENTATION/LAYOUT** | A concerted effort is made to enhance the overall visual presentation of the lab.  (i.e. – photos, video, hyperlinks, buttons, etc.) | Some or most steps of the lab are presented. Some or most individual scientific method tabs are used. The overall visual presentation of the lab is basic but acceptable. | Not all steps of the lab are presented properly or as required. Instructions have not been followed. The overall visual presentation of the lab is poor. More effort and creativity is required. |
|  | **5** | **3-4** | **1-2** |
| **Multi-sensory approach** | Exceptional use of multiple senses | Using 3 senses – modeling (e.g. visual, tactile, hearing) | Using 2 senses (e.g. visual and tactile) |
| **Project Journal/Data Booklet** | Very informative, proposal and articles included, displays all work from start to finish, clearly laid out with dates, easy to interpret | Very informative, displays all work from start to finish | Just there, random bits of information |

**Part D: Presentation (10 marks)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **5-6** | **3-4** | **1-2** |
| **Clear and Logical Presentation** | Knowledgeable without any aids and enthusiastic | Knowledgeable without any aids | Reading from computer or reading from cards |
|  | **4** | **3** | **1-2** |
| **Ability To Answer Questions Accurately** | Answers all questions with confidence | Answers all questions with some hesitation | Answers simple questions with hesitation or unable to answer simple questions |

|  |  |
| --- | --- |
| **Total Mark** | /100 |

**Collingwood Grade 8 Science Expo**

**Innovation Marking Sheet**

Group Members Names: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |  |
| --- | --- | --- | --- |
|  | **3** | **2** | **1** |
| **Title** | Informative, relative, catchy with question format | Clear, visible, using question format | Just any title, not much thought |
|  | **5** | **3-4** | **1-2** |
| **Proposal** | Very informative, superb detail and discussion/rationale, excellent background and supporting info | A clear and supported rationale for innovation, good background and supporting info | Very brief overview, need for and use of innovation not clearly established, little background info given |
|  | **8-10** | **5-7** | **1-4** |
| **Design Process** | Excellent diagrams/blueprint (fully labeled with measurements), comprehensive list of materials, construction procedure very detailed and clear | Basic diagrams, acceptable detail, basic list of materials and construction process and procedure | Incomplete- no blueprint/diagram, materials use and access unclear, construction procedure vague |
| **Testing Method** | Excellent testing procedures, a good detailed process with logical, believable/supported results | Basic but valid testing | Vague and/or unclear testing procedure, poorly conducted, variables not all controlled or considered |
|  | **6-7** | **4-5** | **1-3** |
| **Observations/**  **Results** | Excellent use and presentation of results/visual aids | Basic to good use and presentation of results/visual aids | Unclear and vague results, no to little use of graphs, photos, tables/data (visual aids), etc. given. |
|  | **8-10** | **5-7** | **1-4** |
| **Evaluation/**  **Reflection** | An excellent discussion generated regarding success, utility, problems, improvements etc. of innovation/device | A good discussion generated regarding success, utility, problems, improvements etc. of innovation/device | A minimal discussion generated regarding success, utility, problems, improvements etc. of innovation/device |
|  | **5** | **3-4** | **1-2** |
| **References** | Two or more, variety of two or more types of reliable sources, proper format, alphabetical order | Two or more references, only internet sources | One reference |

**Part A: Scientific Design Process (50 mks)**

**Part B: Originality/ Creativity (10 mks)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **8-10** | **5-7** | **1-4** |
| **Creativity** | Imaginative to highly original project, good use of available resources, well thought out, creative in design and use of materials | Some creativity shown in project of fair to good design, standard approach using common resources or equipment , topic is common | Little imagination, project design simple with minimal input |

**Part C: Innovation/Invention Construction and Weebly Display (30 mks)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **5** | **3-4** | **1-2** |
| **Quality of construction and use of materials** | Excellent construction, good function/operation. A wise, creative use of materials | Decent, solid construction, a good use of available materials | Poorly made, flimsy, inappropriate choice of materials, easily falls apart |
| **Ability/Utility**  **(success) of innovation (device) to demonstrate desired goal** | Device operates well and clearly demonstrates desired goal. | Device may not work as expected but can conceptually convey desired goal | Device/innovation does not work or easily convey or relate desired goal |
|  | **8-10** | **5-7** | **1-4** |
| **WEEBLY PRESENTATION/LAYOUT** | A concerted effort is made to enhance the overall visual presentation of the lab.  (i.e. – photos, video, hyperlinks, buttons, etc.) | Some or most steps of the lab are presented. Some or most individual scientific method tabs are used. The overall visual presentation of the lab is basic but acceptable. | Not all steps of the lab are presented properly or as required. Instructions have not been followed. The overall visual presentation of the lab is poor. More effort and creativity is required. |
|  | **5** | **3-4** | **1-2** |
| **Project Journal/Data Booklet** | Very informative, proposal and articles included, displays all work from start to finish, clearly laid out with dates, easy to interpret | Very informative, displays all work from start to finish | Just there, random bits of information |

**Part D: Presentation (10 mks)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **5-6** | **3-4** | **1-2** |
| **Clear and Logical Presentation** | Knowledgeable without any aids and enthusiastic | Knowledgeable without any aids | Reading from computer or reading from cards |
|  | **4** | **3** | **1-2** |
| **Ability To Answer Questions Accurately** | Answers all questions with confidence | Answers all questions with some hesitation | Answers simple questions with hesitation or unable to answer simple questions |

|  |  |
| --- | --- |
| **Total Mark** | /100 |

Group Members Names: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Science Expo Proposal for Experiment**

**Question:**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Article and how it relates to your experiment:**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**Purpose:**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Hypothesis: *(Written as a formal hypothesis, using “if” and “then”.)***

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Independent variable:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Dependent variable:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Controlled variables**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Group Members Names: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Science Expo Proposal for Innovation/Invention**

* **Attach a written paper (min. 500 words)** that clearly identifies the problem and need for your invention/innovation.

**Article and how it relates to your experiment:**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_