**Scientific Method Project**

**Step 1: Ask a question /10 marks**

Brainstorming. Come up with several ideas that could become a scientific experiment. Remember to identify ideas that are testable, creative, relevant, scientific and fun.

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2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
6. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
7. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
8. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
9. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Step 2: Scientific research /10 marks**

Question:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Once you have your question, it’s time to investigate and get some background info on your research question. This page (and you should add more pages) is used to keep track of useful websites, notes, quotable material, useful graphics etc.

**\*Keep track of your sources (websites) using the works cited page below.**

Example questions that will help you gain some further understanding of your topic:

What scientific theories or concepts will this question/experiment touch on?

What is the history of your subject/topic?

Why is this question important to you?

Has anyone done this experiment before? What can you learn from their experiences?

Where are you going to find the materials for this experiment?- are you going to be able to afford them?

How might investigating this question help others?

**Works Cited Page**

**/5 marks**

Use this page to keep track of websites that have useful information on you research topic.

|  |  |
| --- | --- |
| **Website address** | **Investigating What specifics did you get from the site? (** |
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**Step 3: Myth Development /20 marks**

My Hypothesis is: (Use and “If… then…because..” statement. For example: IF I do this\_\_\_\_\_\_\_, then this \_\_\_\_\_\_\_\_\_\_\_\_will happen because\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.)

Hypothesis: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Can it be tested? Explain how

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Is there real science? What is it?

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How is it going to be fun, relevant, and entertaining?

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**Step 4: Experimental Design and Plan /25**

Test description: (example: this test will determine if you stay more dry walking vs running in the rain)

Independent Variable: (the ONE variable you will change on purpose. Example: the speed at which you walk or run in the rain)

Dependent Variable: (the variable that that you measure and changes as a result of the independent variable. Example: the amount of water that accumulates while walking vs. running in the rain.)

Control Variables: (All other variables that you keep the same in order to have accurate data results from you test.)

Materials/Resources:

Make a list of ALL the materials and other resources you will need for your test.

Safety Procedures:

Make a list of the safety precautions that will be followed during the test. See Pg. XVIII-XXI in BC Science 8 Textbook.

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More?

**Step 5: Test procedure and Data /25**

Make a list of the steps you plan to complete for the test/data collection activity. Be as detailed as possible or you will not get signoff.

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| --- | --- | --- |
| **Step** | **Task** | **Data Collection & Units** |
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**Step 6: Results. Answer your hypothesis /20**

1. Discuss your analysis of your data.
2. Does your data support or deny your hypothesis?

**Marking Rubric**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Extending** | **Proficient** | **Developing** | **Emerging** | **Not initiating** |
| Question | Students include a question that is testable and directly relates to the investigation being performed | Students include a question that is testable and directly relates to the investigation being performed | Students include a question that is testable and directly relates to the investigation being performed | Students include a question that is note testable and does not relate to the investigation being performed | Students did not include a question |
| Hypothesis | Students form a hypothesis using “if…then..because..” statement based on relevant prior knowledge that directly relates to the question being investigated. | Students form a hypothesis using “if…then..because..” statement based on some relevant prior knowledge that is irrelevant or incorrect that directly relates to the question being investigated. | Students form a hypothesis using “if…then..because..” statement based on minimal prior knowledge that does not relate to the question being investigated. | Students hypothesis is not written using an “if..the..because” statement and uses no prior knowledge that does not directly relate to eh question being investigated | Students did not include a hypothesis. |
| Materials | Student lists all materials required to complete the lab. | Student misses 1 or 2 materials required to complete the lab. | Student misses 3 or 4 materials required to complete the lab. | Student misses more than 4 materials required to complete the lab. | Student does not include a materials list |
| Procedure | Student lists all procedures required to complete the lab using correct terminology and placing procedures in correct order. | Student misses 1 or 2 of the procedures required to complete the lab. | Student misses 3 or 4 of the procedures required to complete the lab. | Student misses more than 4 of the procedures required to complete the lab. | Student does not include procedures |
| Results, data and analysis | Represents data appropriately and accurately so that trends and findings are clear. | Represents some data appropriately and accurately so that trends and findings are clear. | Represents little data and presents data in matter that makes trends and findings unclear. | Data is minimal and unclear. | Student does not include their data. |
| Analysis | Provides accurate and insightful analysis of data. | Provides analysis of data | Provides unclear analysis of data | Provides unclear an inaccurate analysis of data | Students did not include an analysis statement with results. |
| Conclusion | Provides a summary of the investigation that includes all of the following:   * What question was investigated * What the hypothesis was * What results were found * If the hypothesis was correct or incorrect * What was learned from the investigation * Possible sources of error * Ideas for the future | Provides a summary of the investigation that includes at least 4 of the following:   * What question was investigated * What the hypothesis was * What results were found * If the hypothesis was correct or incorrect * What was learned from the investigation * Possible sources of error   Ideas for the future | Provides a summary of the investigation that includes at least 3 of the following:   * What question was investigated * What the hypothesis was * What results were found * If the hypothesis was correct or incorrect * What was learned from the investigation * Possible sources of error   Ideas for the future | Provides a summary of the investigation that includes less than 3 of the following:   * What question was investigated * What the hypothesis was * What results were found * If the hypothesis was correct or incorrect * What was learned from the investigation * Possible sources of error   Ideas for the future | Students do not provide a conclusion to summarize their investigation. |
| Scientific Details & accuracy | Descriptions of scientific terms, facts, concepts and theories are complete and correct  Written and/or visual communication is well organized and correct | Descriptions of scientific terms, facts, concepts and theories are mostly complete and correct  Most of the written and/or visual communication is well organized and correct | Descriptions of scientific terms, facts, concepts and theories are partially complete and correct  Some of the written and/or visual communication is well organized and correct | Descriptions of scientific terms, facts, concepts and theories are either incorrect or missing  Little to none of the written and/or visual communication is present or lacks organization. | Descriptions of scientific terms, facts, concepts and theories are not included. |