|  |  |
| --- | --- |
|  **Research Question:** |  |

|  |  |
| --- | --- |
| Prediction, based on observations: | Annotated sketch graph to show predicted outcomes: |
|  |  |

|  |
| --- |
| Scientific explanation for prediction: |
|  |

**Independent variable:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Independent Variable:** |  | Units & Uncertainties: |  |
| Range for **continuous variable** (min 5 increments) |  | **Number of repeats:** |  |
| Explain how this range of values was selected: |
|  |
| Specific method for manipulating the independent variable: |
|  |

**Dependant variable:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Dependent Variable:** |  | Units & Uncertainties: |  |
| Measuring tools: |  |
| Specific method for measuring the DV: |
|  |
| Graph type to be used, with explanation | Calculations needed, with explanation |
|  |  |

**Control of variables:**

|  |  |
| --- | --- |
| Controlled variables (constants), effect on results: | Method for control: |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Materials:**

**Method (step-wise).** Include annotated photo of equipment set-up.

**Safety and Ethics**

|  |  |
| --- | --- |
| Safety precautions | Ethical considerations |
|  |  |

**Design: Self-Assessment Rubric**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | ***Complete / 2*** | ***Partial / 1*** | ***Not at all / 0*** |
| **A****S****P****E****C****T** | Define problem & select variables | Formulates a **focused problem/ research question** and identifies the relevant variables.  | Formulates a problem/research question that is incomplete or identifies only some relevant variables.  | Does not identify a problem/ research question AND does not identify any relevant variables.  |
| Controlling variables | Designs a method for the **effective control** of the variables.  | Designs a method that makes some attempt to control the variables.  | Designs a method that does not control the variables.  |
| Developing a method for collection of data | Develops a method that allows for the collection of **sufficient relevant data**.  | Develops a method that allows for the collection of insufficient relevant data.  | Develops a method that does not allow for any relevant data to be collected.  |

|  |  |  |
| --- | --- | --- |
| Marking Checklist: | * Completed & Correct
 | X Not complete/ incorrect |

|  |  |
| --- | --- |
| **Design** | **Aspect 1: Define the problem and select the variables** |
| * Research Question or Aim clearly stated
* RQ/Aim includes IV and DV
* Background to investigation included
* IV correctly identified with units/ range
* DV correctly identified with units and precision
 | *If a hypothesis is required:** It is quantitative
* A sketch graph is included, with explanation
* Prediction is explained using scientific theory
* Sources are cited
 |
| **Aspect 2: Controlling variables** |
| * Method to manipulate IV, including specific details of range or increments
* Method for recording results, including units and uncertainty of tools (± \_\_\_\_\_\_\_\_\_\_\_ )
* Annotated photo of equipment or experimental set-up
* **Full citation** of published protocol, if used
 | *Controlled variables presented as a table:** **List all variables** to be controlled

***For each variable:*** * How could it impact the results?
* Exactly how will it be controlled? (Value, with method for achieving that value.
 |
| **Aspect 3: Developing a method for collection of sufficient relevant data** |
| * Results table designed before investigation was planned, to guide Design
* How will results be presented? Reason.
* What statistical test(s) will be used? Why?
* Does plan to collect data address RQ?
* **Min. 5 increments** over a suitable range for the IV (continuous)
* **Min. 15 samples** for the IV (discontinuous)
* **Explain** how range of IV was selected
 | * **Explain** how raw data will be transformed into processed data for comparison/ plotting
* Sufficient repeats at each increment to ensure reliability and allow for stats.
* Method clearly presented in step-wise format and can be repeated by others.
* **Safety/ ethics concerns addressed**, including *animal experimentation policy*.
 |