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|  | **Emerging**I have more learning to do | **Developing**I am almost there, but still have more learning to do | **Proficient**I am understanding the concept | **Extending**I’ve got this |
| **Question** | * recognize a scientific question based on a given ­observation
 | * formulate a scientific question containing measurable dependent and independent variables based on a scientific concept
 | * formulate a specific scientific question containing measurable dependent and independent variables based on a scientific concept
 | * formulate a specific and graphable scientific question containing dependent and independent variables based on a scientific concept
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| **Hypothesis** | * recognize independent and dependent variables
 | * recognize the relationship between independent and dependent variables
 | * formulate a hypothesis containing independent and dependent variables (if/then statements)
 | * formulate a hypothesis containing independent and dependent variables and an explanation of why this will happen (if/then/because statements)
 |
| **Back- ground** | * State the hypothesis
 | * support the hypothesis using materials presented in class; clarity could be strengthened
 | * support the hypothesis using materials presented in class and personal research; clarity could be strengthened
 | * clearly support the hypothesis using materials presented in class and personal research
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| **Variables** | * list independent and dependent variables
 | * explain how you will manipulate the independent variable
* list the dependant variable
* list control variables
 | * explain how you will measure the changes in the dependent variable as you manipulate the independent variable
* explain how you will measure the control variables (table)
 | * explain the range of measurements chosen for your independent variable
* explain how and why you have chosen the control variables (table)
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| **Procedure** | * follow procedures provided for me
* follow safety rules while performing and experiment
 | * design an experiment, showing the steps that will be taken, to test a hypothesis given a list of materials
* list safety considerations
 | * design an experiment, showing steps and equipment used to measure the IV and DV (labelled diagram)
* list safety considerations
 | * design an experiment, showing the steps and equipment used to measure the IV, DV and CVs
* list safety considerations
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| **Data Collection** | * recorded quantitative data incomplete or not organized
 | * present quantitative raw data in a table
* list qualitative data
 | * organize quantitative data in a table with the correct headings and units
* present qualitative data in a table
 | * organize quantitative and qualitative data in a table the contains a title, column and row headings and units
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| **Analysis** | * construct a graph using a gathereed data
 | * construct a graph, using gathered data, consisting of most, not all: a title, labelled axes (including units), data points and a best fit line/curve. Scale is appropriate.
 | * construct a graph from gathered data containing a title, labelled axes (including units), data points and a best fit line/curve. Scale is appropriate.
 | * construct a graph from gathered data containing a title, labelled axes (including units), data points, best fit line/curve, and slope
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| **Evaluation** | ---- | * state if the data supports the hypothesis or does not support the hypothesis
 | * state if the data supports the hypothesis or does not support the hypothesis; attempts to answer the question based on the collected data
 | * state if the data supports the hypothesis or does not support the hypothesis; provides discussion of error; provides specific suggestion of further experimentation based on analysis
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