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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 |
| **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 |
| **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) |
| **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 |
| **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 |
| **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 |
| **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 |