2nd Assessment

**THE SCIENTIFIC METHOD RUBRIC**

**Assessment Task : produce a scientific report from conducting an experiment**

**Assessment strategy : performance assessment**

**Assessment tool : observation**

**Name :……………………../class:**

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| **FORMATIVE CRITERIA** | | **MORE TIME AND EFFORT NEEDED** | **DEVELOPING** | **EVIDENT** | **INDEPENDENT** |
| **Differentiate between qualitative and quantitative experiments** | | Has difficulty to explain the differences between qualitative and quantitative experiments | Has a fair understanding of differences between qualitative and quantitative experiments, but needs help to identify examples | Has a good understanding of differences between qualitative and quantitative experiments and is able to identify examples of them. | Has a clear understanding of differences between qualitative and quantitative experiments and is able to identify the example of them easily and completed with the reasons. |
| **Apply the scientific method to answer the question of a problem** | **Problem** – the question that you are trying to answer | The problem is not written in the form of a question / is an incomplete sentence / isn’t related to the experiment conducted | The problem is written in the form of a verification question that is only for building knowledge and is related to the experiment conducted | The problem is written in the form of a significant question that requires explanations and prior knowledge and is related to the experiment conducted | The problem is written in the form of an experimental question that requires explanations, prior knowledge, and is testable. The question directs to the experiment conducted |
| **Hypothesis** – the educated guess at the answer to the problem | The hypothesis is not written in a complete sentence and is not a guess to the problem | The hypothesis is a guess to the problem and not comprehensively written in complete sentences | The hypothesis is a guess or explanation to the problem and comprehensively written in an ‘I think or I hypothesize’ statement | The hypothesis is written as a guess or explanation to the answer of the problem and comprehensively written in an ‘If…then…’ statement |
| **Background research -** gather information about a problem (the theory behind an experiment) | Information doesn’t address directly the question and is arranged in disorganized way | Implicit information addresses a question but is arranged in a disorganized way. Unnecessary information is included. | Explicit information addresses a question. Uses keywords from the question to gather information. The information is arranged in an organized way | Information addresses directly to a question. Uses keywords, a theory behind the experiment/the history of similar experiments or inventions to gather information. The information is arranged in an organized way |
| **Identifying the Variables –** what you are testing **and Controls** – parts of the experiment kept the same in each test | There were big mistakes when mentioning either variables or controls / missing variables or controls / mixed-up variables or controls | Only the variables or the controls are identified but the amount is not included (unit measurement) | Both variables or controls are identified but do not include the amount (unit measurement) | Both variables and controls are clearly identified and the exact amount of variables are included |
| **Procedure** –  A step-by-step explanation of how to perform the experiment | Only ONE of the requirements has been completed :   * is numbered * is in the correct order * includes instructions on what to measure and where to record the data. * is written in complete sentences | Only TWO of the requirements have been completed :   * are numbered * are in the correct order * include instructions on what to measure and where to record the data. * are written in complete sentences | THREE of the requirements have been completed :   * are numbered * are in the correct order * include instructions on what to measure and where to record the data. * are written in complete sentences | The procedure steps have ALL of these requirements :   * are numbered * are in the correct order   include instructions on what to measure and where to record the data.   * are written in complete sentences |

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| **FORMATIVE CRITERIA** | | **MORE TIME AND EFFORT NEEDED** | **DEVELOPING** | **EVIDENT** | **INDEPENDENT** |
| **Apply the scientific method to answer the question of a problem** | **Data** –  The observation results collected from the experiment | Includes qualitative observable data only and the data is organized in a table or paragraph with complete sentences | Include observable quantitative data only and the data is organized in a data table and some numbers have labels | Include both observable quantitative and qualitative data and the data is organized in a data table with some description and some numbers have labels | Include both observable quantitative and qualitative data and the data is organized in a clear data table with complete descriptions, written in complete sentences, all numbers have labels . |
| **Results** – The part of the experiment where we analyze and calculate the data and draw a graph/chart | Doesn’t show any calculations or a graph layout | Neither the calculations or the graph layout were completed | The graph is completed but there were wrong calculations | All calculations are completed and a correct layout with graph has been drawn |
| **Conclusion** –  The part of the experiment that answers the problem. | The conclusion only has ONE of the requirements :   * written in complete sentences. * responds as to whether the hypothesis was right or wrong * answers the question written in the problem * summarizes and evaluates the experimental procedure, making comments about its success and effectiveness. * suggests changes in the experimental procedure (or design) and/or possibilities for further study. | The conclusion has only TWO-THREE of the requirements :   * written in complete sentences. * responds as to whether the hypothesis was right or wrong * answers the question written in the problem * summarizes and evaluates the experimental procedure, making comments about its success and effectiveness. * suggests changes in the experimental procedure (or design) and/or possibilities for further study. | The conclusion has only FOUR of the requirements :   * written in complete sentences. * responds as to whether the hypothesis was right or wrong * answers the question written in the problem * summarizes and evaluates the experimental procedure, making comments about its success and effectiveness. * suggests changes in the experimental procedure (or design) and/or possibilities for further study. | The conclusion includes ALL the requirements :   * written in complete sentences * responds as to whether the hypothesis was right or wrong * answers the question written in the problem * summarizes and evaluates the experimental procedure, making comments about its success and effectiveness. * suggests changes in the experimental procedure (or design) and/or possibilities for further study. |
| **Produce the correct and complete format of a scientific report.** | | Fails to demonstrate an ability to describe the scientific method and its difference from other approaches. Relies on opinion rather than analysis. | Describes the scientific method; demonstrates some understanding of its distinctive value. | Fully describes the scientific method and its distinctive value; differentiates it from other approaches. | Provides in-depth description of the scientific method and its distinctive value; critically differentiates it from other approaches. |