2nd Formative Assessment

THE SCIENTIFIC METHOD RUBRIC

FORMATIVE CRITERIA		MORE TIME AND EFFORT	DEVELOPING	EVIDENCE	INDEPENDENT
Differentiate between qualitative and quantitative experiments		Has got difficulty to explain the differences between qualitative and quantitative experiments	Has a fair understanding about differences between qualitative and quantitative experiments, but needs some help to identify the examples of them	Has a good understanding about differences between qualitative and quantitative experiments and is able to identify the examples of them.	Has a clear understanding about differences between qualitative and quantitative experiments and is able to identify the example of them easily completed with the reasons.
Apply scientific method to answer a question of a problem	**Problem** – the question that you are trying to answer	if the problem is not written in the form of a question / is an incomplete sentence / isn't related to the experiment conducted	If the problem is written in form of a verification question that is only for building knowledge and is related to experiment conducted	If the problem is written in form of a significant question that require explanations and prior knowledge and is related to experiment conducted	If the problem is written in form of an experimental question that require explanations, prior knowledge, and is testable. The question directs to experiment conducted
	Hypothesis – the educated guess at the answer to the problem	if the hypothesis is not written in a complete sentence and is not a guess to the problem	if the hypothesis is a guess to the problem but not comprehensively written in complete sentence	if the hypothesis is a guess or explanation to the problem and comprehensively written in 'I think or I hypothesize' statement	if the hypothesis is written as a guess or explanation to the answer of the problem and comprehensively written in 'If…then…' statement
	Background research - gather information about a problem (the theory behind an experiment)	Information doesn't address directly to a question and arranged in disorganized way	Implicitly information addresses to a question but arranged in disorganized way. In somehow unnecessary information is included.	Explicitly information addresses to a question. Use keywords from the question to gather information. The information arranged in an organized way	Information addresses directly to a question. Use keywords, theory behind the experiment/the history of similar experiments or inventions to gather information. The information arranged in an organized way
	Identifying the Variables – what you are testing **and Controls** – parts of the experiment kept the same in each test	if there were big mistakes occurred on mentioning either variable or controls / missing variable or controls / mixed-up variable or controls	if only the variables or the controls are identified but doesn't include the amount (unit measurement)	If both variables or controls are identified but doesn't include the amount (unit measurement)	if 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	if only ONE 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	if 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	if 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	if 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
	Data – the observation result collected from the experiment	Include 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 description, written in complete sentences, all numbers have labels

	Results – the part of experiment where we analyze and calculate the data and draw graph/chart	Doesn't show any calculations and a graph layout	if neither the calculations or the graph layout were completed	if the graph was completed but there were wrong calculations	if all calculations were completed and a correct layout of graph has been drawn
	Conclusion – the part of the experiment that answers the problem.	if the conclusion only have ONE the requirements : • Written in complete sentences. • responded as to whether the hypothesis was right or wrong • answered the question written in the problem • Summarize and evaluate the experimental procedure, making comments about its success and effectiveness. • Suggest changes in the experimental procedure (or design) and/or possibilities for further study.	if the conclusion only have TWO-THREE the requirements : • Written in complete sentences. • responded as to whether the hypothesis was right or wrong • answered the question written in the problem • Summarize and evaluate the experimental procedure, making comments about its success and effectiveness. • Suggest changes in the experimental procedure (or design) and/or possibilities for further study.	if the conclusion only have FOUR the requirements : • Written in complete sentences. • responded as to whether the hypothesis was right or wrong answered the question written in the problem • Summarize and evaluate the experimental procedure, making comments about its success and effectiveness. • Suggest changes in the experimental procedure (or design) and/or possibilities for further study.	if the conclusion includes ALL the requirements : • written in complete sentences • responded as to whether the your hypothesis was right or wrong • answered the question written in the problem • Summarize and evaluate the experimental procedure, making comments about its success and effectiveness. • Suggest changes in the experimental procedure (or design) and/or possibilities for further study.
Produce the correct and complete format of 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.