



## CFSD 21<sup>st</sup> Century Learning Rubric

### Skill: Scientific Inquiry

Trait	Novice	Basic	Proficient	Advanced
<b>Questions and Hypotheses</b>	Generates questions related to the topic, but <i>not</i> based on observations or scientific knowledge.	Generates relevant questions based on observations and/or scientific knowledge.	Generates relevant questions – based on observations and/or scientific knowledge – and forms a testable hypothesis or research statement.	Generates relevant questions – based on observations and/or scientific knowledge – and forms a testable hypothesis or research statement applied in a new context.
<b>Investigation Design</b>	Inappropriately selects or designs materials, procedures, or models for obtaining data.	Selects or designs materials, procedures, or models for obtaining data that partially address the question.	Evaluates, selects, or designs appropriate materials, procedures, or models for obtaining data that investigate the question.	Evaluates, selects, or designs appropriate materials, procedures, or models for obtaining data that investigate the question applied in a new context.
<b>Data Presentation</b>	Data presentation lacks organization.	Data presentation partially illustrates patterns or trends.	Data presentation accurately illustrates patterns or trends (for example: tables, graphs, statistics).	Data presentation accurately illustrates patterns or trends (for example: tables, graphs, statistics) in a way that recognizes the possibility of bias and correctly highlights the patterns and relationships.
<b>Analysis</b>	Describes irrelevant or nonexistent patterns or trends in data.	Partially describes patterns or trends in data.	Accurately describes patterns or trends in data.	Accurately describes patterns or trends in data to formulate equations, state generalizations or identify relationships.
<b>Conclusion(s)</b>	Draws a conclusion without reference to data.	Uses data, but draws an invalid or incomplete conclusion (lacks internal validity).	Uses data to draw a conclusion to support or refute the hypothesis or research statement (internal validity).	Uses data to draw a conclusion to support or refute the hypothesis or research statement, and apply to a broader context (external validity).

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<b>Refinements and Extensions</b>	Incompletely evaluates components of an investigation.	Evaluates components of an investigation (including experimental error), but suggestions for improvement/modifications or implications for further research is irrelevant.	Evaluates components of an investigation (including experimental error) to suggest improvements/modifications, or implications for further research.	Evaluates components of an investigation (including experimental error); suggests improvements/modification, <i>and</i> implications for further research.
<b>Communication</b>	Communicates components of an investigation without data-based arguments.	Uses data-based, logical arguments to justify and communicate some components of an investigation.	Uses data-based, logical arguments to justify and communicate some components of an investigation clearly, accurately, and completely.	Uses data-based, logical arguments to justify and communicate all components of an investigation clearly, accurately, and completely supports, challenges, and responds to each other's ideas.