# Scientific Inquiry Formative Assessment Rubric for Middle School Students

<table>
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<tr>
<th>COMPONENT</th>
<th>Novice (Level 1)</th>
<th>Intermediate (Level 3)</th>
<th>Skillful (Level 5)</th>
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| I. Raising Questions and Proposing Tentative Explanations | - Your observations are limited and may include opinions and/or inferences.  
- The question you identified is vague or cannot be answered by a scientific investigation. | - Your observations are objective and systematic, but limited in number and depth.  
- You have identified a testable question without a proposed scientific explanation. | - Your observations are objective, systematic, varied, and enhanced by tools or diagrams.  
- You have identified a testable, open-ended question and proposed a scientific explanation. |
| CINQ.1, CINQ.2 and CINQ.5 | | | |

Examples from your work:

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II. Designing Controlled and Replicable Tests to Answer Scientific Questions

| CINQ.3, CINQ.4 and CINQ.5 | - Your procedure is not clear about what you changed and what you kept the same or what you measured to answer the question.  
- Your experiment cannot be repeated because it is confusing or lacking detail. | - Your procedure describes a general plan to change the independent variable, measure the dependent variable and keep some factors constant.  
- Your experiment cannot be repeated because variables are not measurable or quantities are not stated. | - Your procedure describes quantitatively how you plan to change the independent variable, measure the dependent variable and keep everything else constant.  
- Your experiment is replicable and it can generate data to answer the question. |

Examples from your work:
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| III. Recording and working with data | • You collected and recorded too little data to find patterns or be confident in the results.  
• Data are displayed in incomplete or disorganized tables, and graphs are inappropriate for the data or are not constructed properly. | • You collected and recorded appropriate data to address the question, but not enough to identify patterns or to be confident in the results.  
• Data are displayed systematically in tables, but some labels or measurement units may be missing. Graphs are labeled correctly, but there are minor scaling or plotting errors. | • You collected and recorded enough appropriate data to answer the question, be confident in the results, and you analyzed the data to find patterns.  
• Data are displayed systematically and completely in tables that include labels and measurement units. Appropriate graphs clarify the conclusion and are labeled, scaled and plotted correctly. |
| CINQ.6 and CINQ.7 | Examples from your work: | | |
| IV. Communicating and critiquing evidence-based conclusions | • You restated data or retold the procedure, but did not form a conclusion.  
• You did not suggest any changes that could improve the investigation. | • Your conclusion summarizes data from your experiment, but you did not explain how the data relates to a proposed scientific explanation.  
• You suggested changes to the investigation, but it is not clear how they would improve the investigation. | • Your conclusion states and interprets data from your experiment as evidence to support or refute the scientific explanation you proposed.  
• You suggested changes to the investigation that would increase confidence in the conclusion. |
| CINQ.8, CINQ.9 and CINQ.10 | Examples from your work: | | |