

SCIENCE INQUIRY RUBRIC GRADES 9-12
BARRINGTON PUBLIC SCHOOLS

CRITERIA	4 Exceeds the standard	3 Meets the standard	2 Almost meets the standard	1 Does not meet the standard
Formulating Questions and Hypothesizing	<p>Insightfully makes and thoroughly describe observations in order to ask questions, hypothesize make predictions related to topic</p> <ul style="list-style-type: none"> ○ formulates testable questions. <p>Accurately analyzes information from observations, research, or experimental data for the purpose of formulating a question</p> <ul style="list-style-type: none"> ○ accurately identifies problem. ○ make a reasonable prediction or hypothesis based on prior knowledge <p>Constructs a succinct coherent argument in support of that hypothesis</p>	<p>Makes and describes observations in order to ask questions, hypothesize make predictions related to topic</p> <ul style="list-style-type: none"> ○ formulates questions. <p>Analyzes information from observations, research, or experimental data for the purpose of formulating a question</p> <ul style="list-style-type: none"> ○ identifies problem. ○ make a reasonable prediction or hypothesis <p>Constructs coherent argument in support of that hypothesis</p>	<p>Attempts to make and describe observations in order to ask questions, hypothesize make predictions related to topic</p> <ul style="list-style-type: none"> ○ attempts to formulate questions. <p>Analyzes some information from observations, research, or experimental data for the purpose of formulating a question</p> <ul style="list-style-type: none"> ○ identifies part of the problem. ○ makes a prediction or hypothesis <p>Constructs an argument in support of that hypothesis</p>	<p>Does not make and describe observations in order to ask questions, hypothesize make predictions related to topic</p> <ul style="list-style-type: none"> ○ does not formulate questions. <p>Does not analyze information from observations, research, or experimental data for the purpose of formulating a question</p> <ul style="list-style-type: none"> ○ does not identify the problem ○ does not make a prediction or hypothesis <p>Does not construct an argument in support of that hypothesis</p>
Planning and Critiquing Investigations	<p>Completely and concisely identifies information/evidence that needs to be collected in order to answer the question, hypothesis, prediction</p> <p>Develops an organized, complete, and logical approach to investigating the question, including controlling variables</p> <ul style="list-style-type: none"> ○ designs indepth investigations that test hypothesis (if applicable). <p>Provides logical reasoning for appropriateness of materials, tools, procedures, and scale used in the investigation</p>	<p>Identifies information/evidence that needs to be collected in order to answer the question, hypothesis, prediction</p> <p>Develops an organized and logical approach to investigating the question, including controlling variables</p> <ul style="list-style-type: none"> ○ designs investigations that test hypothesis (if applicable). <p>Provides reasoning for appropriateness of materials, tools, procedures, and scale used in the investigation</p>	<p>Identifies some of the information/evidence that needs to be collected in order to answer the question, hypothesis, prediction</p> <p>Develops an approach to investigating the question, including controlling variables</p> <ul style="list-style-type: none"> ○ attempts to design investigations that test hypothesis (if applicable). <p>Provides some reasoning for appropriateness of materials, tools, procedures, and scale used in the investigation</p>	<p>Identifies little or no information/evidence that needs to be collected in order to answer the question, hypothesis, prediction</p> <p>Develops an incomplete approach to investigating the question, including controlling variables</p> <ul style="list-style-type: none"> ○ makes little attempt to design investigations that test hypothesis (if applicable). <p>Does not provide reasoning for appropriateness of materials, tools, procedures, and scale used in the investigation</p>

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Conducting Investigations	<p>Always follows procedures for collecting and recording qualitative or quantitative data, using equipment or measurement devices accurately</p> <ul style="list-style-type: none"> ○ uses tools precisely and accurately ○ uses sophisticated and extended techniques. ○ safely uses tools and techniques ○ conducts and extends investigations <p>Accurately uses accepted methods for organizing, representing, and manipulating data, e.g. tables, graphs, or observations</p> <p>Accurately collects sufficient data to study question, hypothesis, or relationships</p> <ul style="list-style-type: none"> ○ accurately makes qualitative observations. ○ accurately collects quantitative data 	<p>Follows procedures for collecting and recording qualitative or quantitative data, using equipment or measurement devices accurately</p> <ul style="list-style-type: none"> ○ uses tools appropriately. ○ uses appropriate techniques. ○ safely uses tools and techniques ○ conducts investigations thoroughly <p>Uses accepted methods for organizing, representing, and manipulating data, e.g. tables, graphs, or observations</p> <p>Collects sufficient data to study question, hypothesis, or relationships</p> <ul style="list-style-type: none"> ○ makes qualitative observations. ○ collects quantitative data 	<p>Sometimes follows procedures for collecting and recording qualitative or quantitative data, using equipment or measurement devices accurately</p> <ul style="list-style-type: none"> ○ uses some tools appropriately. ○ uses some appropriate techniques. ○ sometimes uses tools and techniques safely ○ conducts investigations <p>Uses methods for organizing, representing, and manipulating data, e.g. tables, graphs, or observations</p> <p>Collects insufficient data to study question, hypothesis, or relationships</p> <ul style="list-style-type: none"> ○ makes few or inaccurate qualitative observations. ○ collects incomplete or insufficient quantitative data 	<p>Does not follow procedures for collecting and recording qualitative or quantitative data, using equipment or measurement devices accurately</p> <ul style="list-style-type: none"> ○ does not use tools appropriately. ○ does not use appropriate techniques. ○ does not use tools and techniques safely ○ does not conduct investigations <p>Does not use methods for organizing, representing, and manipulating data, e.g. tables, graphs, or observations</p> <p>Does not collect data to study question, hypothesis, or relationships</p> <ul style="list-style-type: none"> ○ does not make qualitative observations. ○ does not collect quantitative data
Developing and Evaluating Explanations	<p>Accurately analyzes data, including determining if data are relevant, artifact (a result of incorrect procedure), irrelevant, or anomalous (out of ordinary)</p> <ul style="list-style-type: none"> ○ accurately represents, analyzes and interprets data. <p>Uses evidence to support and justify interpretations and conclusions or explain how the evidence refutes the hypothesis</p> <ul style="list-style-type: none"> ○ makes an accurate claim based on 	<p>Analyzes data, including determining if data are relevant, artifact (a result of incorrect procedure), irrelevant, or anomalous (out of ordinary)</p> <ul style="list-style-type: none"> ○ represents, analyzes and interprets data. <p>Uses evidence to support and justify interpretations and conclusions or explain how the evidence refutes the hypothesis</p> <ul style="list-style-type: none"> ○ makes an accurate claim based on 	<p>Attempts to analyze data</p> <ul style="list-style-type: none"> ○ represents data. <p>Uses some evidence to support and justify interpretations and conclusions or explain how the evidence refutes the hypothesis</p> <ul style="list-style-type: none"> ○ makes a claim 	<p>Incorrectly analyzes data</p> <ul style="list-style-type: none"> ○ represents data insufficiently . <p>Uses no evidence to support and justify interpretations and conclusions and does not explain how the evidence refutes the hypothesis</p> <ul style="list-style-type: none"> ○ does not make a claim

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	<p>observations and relates it to class and beyond</p> <ul style="list-style-type: none"> ○ supports claims with the most appropriate data or evidence. <p>Effectively communicates how scientific knowledge applies to explain results, propose further investigations, or construct and analyze alternative explanations</p> <ul style="list-style-type: none"> ○ effectively communicates an understanding of ideas. ○ thoroughly critiques investigation. <p>Thoroughly completed pre-labs</p>	<p>observations.</p> <ul style="list-style-type: none"> ○ supports claims with appropriate data or evidence. <p>Communicates how scientific knowledge applies to explain results, propose further investigations, or construct and analyze alternative explanations</p> <ul style="list-style-type: none"> ○ communicates an understanding of ideas. ○ critiques investigation. <p>Completed pre-lab assignment</p>	<ul style="list-style-type: none"> ○ supports some claims with appropriate data or evidence. <p>Attempts to communicate how scientific knowledge applies to explain results, propose further investigations, or construct and analyze alternative explanations</p> <ul style="list-style-type: none"> ○ attempts to communicate an understanding of ideas. ○ attempts to critique investigation. <p>Partially or attempts to complete pre-lab assignment</p>	<ul style="list-style-type: none"> ○ does not support claims with appropriate data or evidence. <p>Does not communicate how scientific knowledge applies to explain results, propose further investigations, or construct and analyze alternative explanations</p> <ul style="list-style-type: none"> ○ does not communicate an understanding of ideas. ○ does not critique investigation. <p>Does not complete pre-lab assignment</p>
Lab Work Ethic and Accountability	<p>Works independently and leads the teams while completing assigned work.</p> <p>Draws independent conclusions from own data and additional sources.</p> <p>Communicates ideas both orally and in writing within the team. and class-wide.</p>	<p>Works independently as a member of the team while completing assigned work.</p> <p>Draws independent conclusions from own data.</p> <p>Communicates ideas both orally and in writing within the team.</p>	<p>At times, works independently as a member of the team while completing assigned work.</p> <p>At times draws independent conclusions from own data.</p> <p>At times communicates ideas both orally and in writing within the team.</p>	<p>Does not work independently as a member of the team while completing assigned work.</p> <p>Does not draw independent conclusions from own data.</p> <p>Does not communicate ideas both orally and in writing within the team.</p>

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