

Scientific Inquiry Using Scientific Practices Mission Folder Scorecard

Use of Scientific Inquiry

Suggested file attachments: bibliography, experimental procedure, photos of experiment, data spreadsheets, charts, graphs, PowerPoint presentations if used as part of experiment

Total maximum points in this section: 350

<i>Mission Folder Questions and Answers</i>	<i>Judging Criteria</i>	<i>Max Points</i>	<i>Scoring Details</i>	<i>Score</i>
Problem Statement				
<p>What problem in your community did your team investigate? Why is this problem important to your community?</p> <p>The team's answer will be placed here.</p>	<p>Selected problem deals with an interesting or challenging community issue</p>	15	<p>0-3: Does not state (0) or does not answer appropriately (3) 4-6: Statement, but is not a problem (4), states a problem but not clear (6) 7-9: States a problem, but rather generic in nature 10-12: States an interesting or challenging problem 13-15: States a very unique problem</p>	
<p>The team's answer will be placed here.</p>	<p>Clear and concise question, thesis statement, or problem statement</p>	20	<p>0-5: Does not state (0) or answers but not appropriately (5) 6-9: Statement but is not a problem (6), states a problem but is vague (9) 10-13: Statement is generic in nature, lacks detail 14-16: Statement is clear 17-20: Statement is very clear and concise</p>	
<p>List at least 10 resources you used to complete your research (e.g., websites, professional journals, periodicals, subject matter experts). Use multiple types of resources and do not limit yourself to only websites.</p> <p>The team's answer will be placed here.</p>	<p>Literature search is extensive and scholarly sources are reputable and varied</p>	20	<p>Add 1 point for EACH generic resource (no detail) Add 2 points for EACH specific resource</p>	
<p>Describe what you learned in your research.</p> <p>The team's answer will be placed here.</p>	<p>Describes relevant information that relates to the selected Mission Challenge</p>	20	<p>0-5: Does not state (0) or answers but not appropriately (5) 6-9: Statement but does not related to Mission Challenge (6), statement but is vague (9) 10-13: Statement is generic in nature, lacks detail 14-16: Statement is clear, relates relevant information to Mission Challenge 17-20: Statement is very clear, states what was learned and how it relates</p>	

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Hypothesis				
<p>State your hypothesis and describe how it could help investigate your problem.</p> <p>The team's answer will be placed here.</p>	<p>Develops a logical hypothesis based on an analysis of all research</p>	15	<p><i>Add 3 points - An independent variable is stated</i> <i>Add 3 points - A dependent variable is stated</i> <i>Add 3 points - The independent and dependent variables are related</i> <i>Add 3 points - Describes how it investigates the</i> <i>Add 3 points - Evidence of research is present to support the hypothesis</i></p>	
<p>Identify the independent variables and dependent variables in your hypothesis.</p> <p>The team's answer will be placed here.</p>	<p>Correctly identifies the independent and dependent variables.</p>	15	<p><i>Add 7 points - Correctly identifies the independent variables</i> <i>Add 7 points - Correctly identifies the dependent variables</i> <i>Add 1 point - Correctly identifies both independent and dependent variables</i></p>	
<p>When you developed your hypothesis how did you know it could be tested AND could be proven false by testing?</p> <p>The team's answer will be placed here.</p>	<p>Hypothesis is valid, testable, and addresses the question, thesis statement, or problem statement</p>	15	<p><i>Add 5 points - Hypothesis addresses the question, thesis or problem statement</i> <i>Add 5 points - Hypothesis is testable</i> <i>Add 5 points - Hypothesis can be proven false by testing</i></p>	

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Experimental Design				
<p>List the materials you used in your experiment. Include technologies you used (e.g., scientific equipment, internet resources, computer programs, multimedia, etc.).</p> <p>The team's answer will be placed here.</p>	<p>Appropriate use of scientific equipment, materials and technology as part of the experiment</p>	20	<p>0-5: Does not state (0), answers but not appropriate materials for experiment (5) 6-9: Lists materials, but the materials are vague, many missing, some not appropriate 10-13: Lists specific materials and equipment, some missing or not appropriate 14-16: Lists specific materials, equipment and technologies, one or two missing 17-20: Lists specific materials, equipment and technologies that are appropriate for experiment</p>	
<p>Identify the control group, and the constants in your experiments.</p> <p>The team's answer will be placed here.</p>	<p>Accurately identifies the control group, and constants</p>	20	<p>Add 10 points - Identifies the appropriate control group Add 10 points - Identifies all constants Deduct points for missing constants - i.e. if 5 constants are needed, deduct 2 points per missing constant</p>	
<p>What was your experimental process? Include each of the steps in your experiment. Include all safety precautions used by your team as step one.</p> <p>The team's answer will be placed here.</p>	<p>The proposed experiment is conducted sufficiently (qualitatively and quantitatively) and is a valid test of the hypothesis</p>	40	<p>0-7: No experiment listed (0), no details or does not test hypothesis (up to 7), safety precautions not addressed 8-15: Describes an experiment that tests the hypothesis, lacks details, missing many steps, missing safety precautions 16-23: Tests the hypothesis, lists steps, missing steps and/or details, lists all safety precautions 24-31: Tests the hypothesis, minor steps or details missing 32-40: Tests the hypothesis and can be replicated by anyone</p>	
	<p>Use of an original, resourceful and novel approach to conducting the experiment</p>	20	<p>0-5: Does not state (0), answers but not original, resourceful or novel (5) 6-9: Experiment is either original, resourceful or novel (only one) 10-13: Experiment is either original, resourceful or novel (only one but is very detailed) 14-16: Experiment is either original, resourceful or novel (only two) 17-20: Experiment is either original, resourceful and novel (all three)</p>	

Mission Folder Questions and Answers	Judging Criteria	Max Points	Scoring Details	Score
Data Collection and Analysis				
<p>Present the data you collected and observed in your testing. The use of data tables, charts and/or graphs is encouraged.</p> <p>The team's answer will be placed here.</p>	<p>A sufficient amount of data is collected and well-presented</p>	30	<p>0-5: Very minimal or no data presented 6-11: Data collected, appropriate data tables OR either displayed as charts/graphs 12-18: Data collected, appropriate data tables AND either displayed as charts/graphs 19-25: Data collected from at least 3 trials, appropriate data tables OR displayed as charts/graphs 26-30: Data collected from at least 3 trials, appropriate data tables AND displayed as charts/graphs</p>	
<p>Analyze the data you collected and observed in your testing. Does your data support or refute your hypothesis? Do not answer with a "yes" or "no." Explain your answer using one of the following prompts: "Our data supports/refutes the hypothesis because . . ." Explain any sources of error and how these could have affected your results.</p> <p>The team's answer will be placed here.</p>	<p>Appropriate use of mathematical calculations</p>	15	<p>0-3: Does not analyze (0), or incorrect calculations used (3) 4-6: Analyzes some of the data correctly, some incorrectly 7-9: Minor errors in data calculations 10-12: Analyzes data correctly 13-15: Analyzes data correctly, uses appropriate significant figures</p>	
	<p>Explains how the data supports or refutes the hypothesis</p>	15	<p>0-3: Does not explain (0), or incorrect explanation used/does not use prompt (3) 4-6: Uses correct prompt, does not explain 7-9: Uses correct prompt, explains but very vague 10-12: Uses correct prompt, explains, lacks some detail 13-15: Uses correct prompt, explanation very thorough</p>	
	<p>Lists sources of error and explains how these could have affected the results</p>	15	<p>0-3: Does not list any errors (0), or incorrect explanation (3) 4-6: Lists sources of error only, no explanation 7-9: Lists sources of error, explains how affected the results, but vague 10-12: Lists sources of error, explains how affected the results, lacks some detail, includes data tables, charts and/or graphs 13-15: Lists sources of error, explanation very thorough AND includes data tables, charts and/or graphs</p>	

Mission Folder Questions and Answers	Judging Criteria	Max Points	Scoring Details	Score
Drawing Conclusions				
<p>Interpret and evaluate your results and write a conclusion statement that includes the following: Describe what you would do if you wanted to retest or further test your hypothesis. Evaluate the usefulness of the data your team collected. What changes would you make to your hypothesis and/or experimental design in the future, if any?</p> <p>The team's answer will be placed here.</p>	Description of how the team would retest or further test their hypothesis	10	0-3: Does not describe (0), or incorrect description (3) 4-5: Describes how team would retest or further test, very vague 6-7: Describes how team would retest or further test, lacks detail 8-9: Detailed description for retesting or further testing their hypothesis 10: Detailed description for retesting or further testing their hypothesis, very thorough and clear	
	Evaluation of the usefulness of the data	15	0-3: Does not describe (0), or incorrect explanation (3) 4-6: Evaluates data, but vague 7-9: Evaluates data, lacks detail 10-12: Evaluates data, has detail 13-15: Evaluates data, explanation very thorough	
	Changes the team would make to their hypothesis and/or experimental design	10	0-3: Does not describe (0), or incorrect description (3) 4-5: Lists new hypothesis and/or experimental design, very vague 6-7: Lists new hypothesis and/or experimental design, lacks detail 8-9: Lists new hypothesis and/or experimental design, has detail 10: Lists new hypothesis and/or experimental design, very thorough and clear	
	Appropriate use of scientific terminology throughout the "Use of Scientific Inquiry/Practices" section	10	0-3: Does not use at all (0) or very minimal (3) 4-5: Use of scientific terminology is limited 6-7: Uses some appropriate terminology, some inaccurate 8-9: Uses appropriate terminology throughout 10: Uses appropriate terminology throughout, uses significant digits	
	Proper use of grammar, spelling and punctuation throughout the "Use of Scientific Inquiry/Practices" section	10	0-3: 11 or more errors in document 4-5: Correct grammar, spelling, and punctuation throughout (9-10 errors) 6-7: Correct grammar, spelling, and punctuation throughout (5-8 errors) 8-9: Correct grammar, spelling, and punctuation throughout (1-4 minor errors) 10: Correct grammar, spelling, and punctuation throughout (no errors)	
Use of Scientific Inquiry using Scientific Practices Subtotal				

Benefit to the Community

Suggested file attachments: brochures, fliers, posters, website links

Total maximum points in this section: 90

<i>Mission Folder Question and Answer</i>	<i>Judging Criteria</i>	<i>Max Points</i>	<i>Scoring Details</i>	<i>Score</i>
<p>How could your experiments and data help solve your problem and benefit your community? Describe next steps for further research/experimentation and how you have or how you could implement your solution in the future.</p> <p>The team's answer will be placed here.</p>	<p>Results show the potential to resolve the community problem or significantly impact the community problem</p>	75	<p>Add 14 points for each of the following (and add 5 points each if very detailed and clear):</p> <ul style="list-style-type: none"> - Answers "how could your experiments and data solve your problem?" - Answers "how could your experiments and data benefit your community?" - Describes the next steps for research/experimentation - Answers "how have/could you implement your solution in the future?" 	
	<p>Proper use of grammar, spelling and punctuation</p>	15	<p>0-3: 7 or more errors in Benefit to the Community section 4-6: Correct grammar, spelling, and punctuation in section (5-6 errors) 7-9: Correct grammar, spelling, and punctuation in section (3-4 errors) 10-12: Correct grammar, spelling, and punctuation in section (1-2 minor errors) 13-15: Correct grammar, spelling, and punctuation in section (no errors)</p>	
Benefit to Community Subtotal				

Team Collaboration

Suggested file attachments: Breakdown of team responsibilities, team plan, experiment schedule

Total maximum points in this section: 60

<i>Mission Folder Question and Answer</i>	<i>Judging Criteria</i>	<i>Max Points</i>	<i>Scoring Details</i>	<i>Score</i>
<p>Describe the plan your team used to complete your Mission Folder. Be sure to explain the role of each team member and how you shared and assigned responsibilities. Describe your team's process to ensure that assignments were completed on time and deadlines were met.</p> <p>The team's answer will be placed here.</p>	Team participates in planning and encouraging others	20	Add 7 points - A plan is stated (Add 3 more points if very detailed) Add 7 points - A description of how students encouraged each other (Add 3 more points if very detailed)	
	Team members fulfill a broad range of responsibilities	15	Add 6 points - Description of roles is described and assigned (Add 2 more points if very detailed) Add 5 points - Responsibilities assigned for each team member (Add 2 more points if very detailed)	
	Each team member follows the team action plan and helps others stay on track	15	Add 6 points - Evidence of EACH team member followed the action plan/calendar (Add 2 more points if very detailed) Add 5 points - Evidence of EACH team member helped others stay on track (Add 2 more points if very detailed)	
	Proper use of grammar, spelling and punctuation	10	0-3: 5 or more errors in Team Collaboration section 4-5: Correct grammar, spelling, and punctuation in section (4 errors) 6-7: Correct grammar, spelling, and punctuation in section (3 errors) 8-9: Correct grammar, spelling, and punctuation in section (1-2 minor errors) 10: Correct grammar, spelling, and punctuation in section (no errors)	
Team Collaboration Subtotal				
Mission Folder Total Score				