

	Hypothesis/Question Formation	Collect Data/Carryout Investigation	Analyze & Interpret	Warrant Claim with Data																																																		
	A practice of science is to ask and refine questions that lead to descriptions and explanations of how the natural and designed world works and which can be empirically tested.	Scientists plan and carry out investigations in the field or laboratory, their investigations are systematic and require clarifying what counts as data and identifying variables or parameters.	Scientific investigations produce data that must be analyzed in order to derive meaning.	Scientists must identify sufficient and appropriate data to justify their claim.																																																		
	<p>Example:</p> <p>If I change the amount of liquid so that it increases, then I will observe that the density of the liquid will stay the same.</p>	<p>Example:</p> <table border="1"> <thead> <tr> <th>Trial #</th> <th>Container Shape</th> <th>Liquid Type</th> <th>Container Filled To</th> <th>Liquid Density (g/ml)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>narrow</td> <td>oil</td> <td>quarter</td> <td>0.85</td> </tr> <tr> <td>2</td> <td>narrow</td> <td>oil</td> <td>half</td> <td>0.85</td> </tr> <tr> <td>3</td> <td>narrow</td> <td>oil</td> <td>full</td> <td>0.85</td> </tr> </tbody> </table>	Trial #	Container Shape	Liquid Type	Container Filled To	Liquid Density (g/ml)	1	narrow	oil	quarter	0.85	2	narrow	oil	half	0.85	3	narrow	oil	full	0.85	<p>Example:</p> <p>When I changed the amount of liquid so that it increased, the density of the liquid stayed the same. This supports my hypothesis.</p>	<p>Example:</p> <table border="1"> <thead> <tr> <th>Select</th> <th>Trial #</th> <th>Container Shape</th> <th>Liquid Type</th> <th>Container Filled To</th> <th>Liquid Density (g/ml)</th> </tr> </thead> <tbody> <tr> <td><input checked="" type="checkbox"/></td> <td>1</td> <td>narrow</td> <td>oil</td> <td>quarter</td> <td>0.85</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>2</td> <td>narrow</td> <td>oil</td> <td>half</td> <td>0.85</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>3</td> <td>narrow</td> <td>oil</td> <td>full</td> <td>0.85</td> </tr> <tr> <td><input type="checkbox"/></td> <td>4</td> <td>wide</td> <td>alcohol</td> <td>full</td> <td>0.78</td> </tr> </tbody> </table>	Select	Trial #	Container Shape	Liquid Type	Container Filled To	Liquid Density (g/ml)	<input checked="" type="checkbox"/>	1	narrow	oil	quarter	0.85	<input checked="" type="checkbox"/>	2	narrow	oil	half	0.85	<input checked="" type="checkbox"/>	3	narrow	oil	full	0.85	<input type="checkbox"/>	4	wide	alcohol	full	0.78
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1	Hypothesis incorrectly mixes independent and dependent variables.	Data collection processes yield only one trial, or multiple trials with no variable values changed.	Interpretation incorrectly mixes independent and dependent variables.	Warrant has only one trial.																																																		
2	Hypothesis only has an appropriate independent/dependent variable in one place.	Data collection processes yield two or more trials, but does not show understanding of neither controlled data, nor targeting the independent variable in the hypothesis.	Interpretation has correct independent and dependent variables, but an incorrect relationship found in the data.	Warrant has two or more trials, none of which are controlled.																																																		
3	Hypothesis has independent and dependent variables in correct places, but is not consistent with the goal.	Data collection processes show understanding of either controlled data, or targeting the independent variable in the hypothesis.	Interpretation has correct independent and dependent variables, and a correct relationship found in the data. It does not, however, correctly link to the hypothesis.	Warrant has two or more controlled trials reflecting the relationship found in the claim, but also has other trials which are not controlled.																																																		
4	Hypothesis has independent and dependent variables in correct places, and is consistent with the goal.	Data collection processes demonstrate understanding of both controlled trials, and targeting the independent variable in the hypothesis.	Interpretation has all of the following: correct independent and dependent variables, a correct relationship between them, and a correct linking to the hypothesis.	Warrant has two or more controlled trials reflecting the relationship found in the claim, and only controlled trials are selected.																																																		