

Exploring Life Lab Test Rubric Summary – Pat Waller – All Students (n = 42)

(modified from a rubric used by the Olathe East High School Science Department, Olathe, KS)

Standards: The levels at which students are expected to perform the task

Mean Score	Advanced (5)	Proficient (3)	Needs Improvement (1)
<u>2.714</u>	<ul style="list-style-type: none"> Question is narrowly focused and suggests how an answer might be investigated. It is answerable. 	<ul style="list-style-type: none"> Question is answerable but not narrowly focused. 	<ul style="list-style-type: none"> Question is too broad and not practically investigated.
	<p>St. Dev =.944 Median =3 Mode =3</p>		
<u>2.452</u>	<ul style="list-style-type: none"> Correctly identifies specific, measurable independent and dependent variables. 	<ul style="list-style-type: none"> Identifies variable being tested & variable being measured. 	<ul style="list-style-type: none"> Variables and constants significantly incomplete &/or inaccurate.
	<p>St. Dev =1.90 Median =1 Mode =1</p>		
<u>2.666</u>	<ul style="list-style-type: none"> Hypothesis is testable and clearly stated in "If... then..." format. Specifically predicts relationship between dependent and independent variables. 	<ul style="list-style-type: none"> Hypothesis is clearly stated. It predicts the influence of one variable on another. 	<ul style="list-style-type: none"> Hypothesis is poorly stated and doesn't directly mention the variables.
	<p>St. Dev =1.45 Median =3 Mode =3</p>		
<u>2.785</u>	<ul style="list-style-type: none"> Complete, detailed list of materials (size, conc., quantity) presented in vertical list format. 	<ul style="list-style-type: none"> Most materials are listed and appropriate. 	<ul style="list-style-type: none"> Materials quite incomplete or inappropriate for experiment.
	<p>St. Dev =1.42 Median =3 Mode =3</p>		
<u>3.380</u>	<ul style="list-style-type: none"> Accurately tests the hypothesis 	<ul style="list-style-type: none"> Attempts to test hypothesis 	<ul style="list-style-type: none"> Does not address hypothesis.
	<p>St. Dev =1.10 Median =3 Mode =3</p>		
<u>2.619</u>	<ul style="list-style-type: none"> Conducts or analyzes at least 3 trials. 	<ul style="list-style-type: none"> Multiple trials attempted or need is recognized. 	<ul style="list-style-type: none"> Single trial, poor understanding of use of multiple trials.
	<p>St. Dev =1.41 Median =3 Mode =3</p>		
<u>2.238</u>	<ul style="list-style-type: none"> Procedure is in vertical list format, accurate, complete, easy-to-follow, and reproducible by another person. Includes diagrams to clarify procedures. 	<ul style="list-style-type: none"> Step-by-step procedure, generally complete. Minor errors/ omissions make it difficult to follow or not always repeatable. 	<ul style="list-style-type: none"> Procedure difficult to follow. Major omissions or errors.
	<p>St. Dev =.983 Median =3 Mode =3</p>		
<u>3.095</u>	<ul style="list-style-type: none"> Includes all appropriate safety concerns. 	<ul style="list-style-type: none"> Includes critical safety concerns. 	<ul style="list-style-type: none"> Safety concerns trivial or inadequately addressed.
	<p>St. Dev =1.15 Median =0 Mode =0</p>		
<u>2.136</u>	<p>AVG Procedure St. Dev =.743</p>		
<u>2.095</u>	<ul style="list-style-type: none"> Data table contains accurate, precise raw data & summary data reported in correct SI units with descriptive title. 	<ul style="list-style-type: none"> Data table with accurate data, most units labeled or implied. Minor errors. Title absent or trivial. 	<ul style="list-style-type: none"> Data table inaccurate, confusing, and/or incomplete. Missing units.
	<p>St. Dev =1.44 Median =2 Mode =1</p>		
<u>.0714</u>	<ul style="list-style-type: none"> Data summarized in well-organized, easy-to-read graph &/or figures. Descriptive title, appropriate labeling, keys, etc. 	<ul style="list-style-type: none"> Data displayed in well organized easy to read graph &/or figures. Descriptive title, minor errors in use of units and labeling. 	<ul style="list-style-type: none"> Graph/figures presented in a confusing and/or sloppy fashion.
	<p>St. Dev =.462 Median =0 Mode =0</p>		
<u>1.738</u>	<ul style="list-style-type: none"> Data summarized in a clear, concise, logical manner. Patterns identified & described, but no conclusions drawn. 	<ul style="list-style-type: none"> Reasonable, but somewhat unclear summary of data. Patterns in data not clearly identified. 	<ul style="list-style-type: none"> Summary is unclear and illogical. Patterns in data not identified.
	<p>St. Dev =1.36 Median =1 Mode =1</p>		
<u>1.301</u>	<p>AVG Data Collection St. Dev= .799</p>		

	<i>Conclusion</i>			
<u>1.833</u>	St. Dev =1.34 Median =1 Mode =1	<ul style="list-style-type: none"> Scientifically valid, logical conclusion, well supported by the data collected. Clearly addresses problem and stated hypothesis. 	<ul style="list-style-type: none"> Scientifically valid, logical conclusion, supported by data collected. Attempts to address problem and stated hypothesis. 	<ul style="list-style-type: none"> Conclusion is incomplete or illogical. Does not address the problem and hypothesis.
<u>.5238</u>	St. Dev =1.06 Median =0 Mode =0	<ul style="list-style-type: none"> Sources of error identified and explained. Appropriate recommendations made to eliminate errors. 	<ul style="list-style-type: none"> Sources of error identified. 	<ul style="list-style-type: none"> Weak/trivial attempt to identify sources of error.
<u>.1904</u>	St. Dev =.671 Median =0 Mode =0	<ul style="list-style-type: none"> Student generates specific questions for future study. 	<ul style="list-style-type: none"> Student makes attempt to generate questions for future study. 	<ul style="list-style-type: none"> Student makes incomplete or inappropriate attempt to extend or apply knowledge.
<u>.8492</u>	AVG Conclusions St. Dev =.800			

Grand Total
Stan. Dev = .6085

Grand Total
Means = 1.829

Exploring Life Lab Test Rubric Summary – Randy Dix – All Students (n = 56)

(modified from a rubric used by the Olathe East High School Science Department, Olathe, KS)

Standards: The levels at which students are expected to perform the task

Mean Score	Advanced (5)	Proficient (3)	Needs Improvement (1)
	Question		
<u>3.160</u>	<ul style="list-style-type: none"> Question is narrowly focused and suggests how an answer might be investigated. It is answerable. 	<ul style="list-style-type: none"> Question is answerable but not narrowly focused. 	<ul style="list-style-type: none"> Question is too broad and not practically investigated.
	<p>St. Dev =1.32 Median =3 Mode =3</p> <p><i>Identificatin of Variables</i></p>		
<u>2.607</u>	<ul style="list-style-type: none"> Correctly identifies specific, measurable independent and dependent variables. 	<ul style="list-style-type: none"> Identifies variable being tested & variable being measured. 	<ul style="list-style-type: none"> Variables and constants significantly incomplete &/or inaccurate.
	<p>St. Dev =1.76 Median =3 Mode =1</p> <p><i>Hypothesis</i></p>		
<u>3.464</u>	<ul style="list-style-type: none"> Hypothesis is testable and clearly stated in "If... then..." format. Specifically predicts relationship between dependent and independent variables. 	<ul style="list-style-type: none"> Hypothesis is clearly stated. It predicts the influence of one variable on another. 	<ul style="list-style-type: none"> Hypothesis is poorly stated and doesn't directly mention the variables.
	<p>St. Dev =1.46 Median =4 Mode =5</p>		
<u>3.071</u>	<ul style="list-style-type: none"> Complete, detailed list of materials (size, conc., quantity) presented in vertical list format. 	<ul style="list-style-type: none"> Most materials are listed and appropriate. 	<ul style="list-style-type: none"> Materials quite incomplete or inappropriate for experiment.
	<p><i>Materials</i></p> <p>St. Dev =1.17 Median =3 Mode =3</p>		
<u>3.357</u>	<ul style="list-style-type: none"> Accurately tests the hypothesis 	<ul style="list-style-type: none"> Attempts to test hypothesis 	<ul style="list-style-type: none"> Does not address hypothesis.
	<p><i>Procedure</i></p> <p>St. Dev =1.50 Median =3 Mode =3</p>		
<u>2.517</u>	<ul style="list-style-type: none"> Conducts or analyzes at least 3 trials. 	<ul style="list-style-type: none"> Multiple trials attempted or need is recognized. 	<ul style="list-style-type: none"> Single trial, poor understanding of use of multiple trials.
	<p>St. Dev =2.04 Median =2 Mode =5</p>		
<u>2.75</u>	<ul style="list-style-type: none"> Procedure is in vertical list format, accurate, complete, easy-to-follow, and reproducible by another person. Includes diagrams to clarify procedures. 	<ul style="list-style-type: none"> Step-by-step procedure, generally complete. Minor errors/ omissions make it difficult to follow or not always repeatable. 	<ul style="list-style-type: none"> Procedure difficult to follow. Major omissions or errors.
	<p>St. Dev =1.57 Median =3 Mode =3</p>		
<u>1.071</u>	<ul style="list-style-type: none"> Includes all appropriate safety concerns. 	<ul style="list-style-type: none"> Includes critical safety concerns. 	<ul style="list-style-type: none"> Safety concerns trivial or inadequately addressed.
	<p>St. Dev =1.55 Median =0 Mode =0</p>		
<u>2.424</u>	AVG Procedure St. Dev =1.23		
<u>2.232</u>	<ul style="list-style-type: none"> Data table contains accurate, precise raw data & summary data reported in correct SI units with descriptive title. 	<ul style="list-style-type: none"> Data table with accurate data, most units labeled or implied. Minor errors. Title absent or trivial. 	<ul style="list-style-type: none"> Data table inaccurate, confusing, and/or incomplete. Missing units.
	<p><i>Data Collection & Presentation</i></p> <p>St. Dev =1.64 Median =3 Mode =3</p>		
<u>1.473</u>	<ul style="list-style-type: none"> Data summarized in well-organized, easy-to-read graph &/or figures. Descriptive title, appropriate labeling, keys, etc. 	<ul style="list-style-type: none"> Data displayed in well organized easy to read graph &/or figures. Descriptive title, minor errors in use of units and labeling. 	<ul style="list-style-type: none"> Graph/figures presented in a confusing and/or sloppy fashion.
	<p>St. Dev =1.71 Median =1 Mode =0</p>		
<u>0.75</u>	<ul style="list-style-type: none"> Data summarized in a clear, concise, logical manner. Patterns identified & described, but no conclusions drawn. 	<ul style="list-style-type: none"> Reasonable, but somewhat unclear summary of data. Patterns in data not clearly identified. 	<ul style="list-style-type: none"> Summary is unclear and illogical. Patterns in data not identified.
	<p>St. Dev =1.56 Median =0 Mode =0</p>		
<u>1.485</u>	AVG Data Collection St. Dev= 1.42		

	<i>Conclusion</i>			
<u>2.053</u>	St. Dev =1.65 Median =2 Mode =1	<ul style="list-style-type: none"> Scientifically valid, logical conclusion, well supported by the data collected. Clearly addresses problem and stated hypothesis. 	<ul style="list-style-type: none"> Scientifically valid, logical conclusion, supported by data collected. Attempts to address problem and stated hypothesis. 	<ul style="list-style-type: none"> Conclusion is incomplete or illogical. Does not address the problem and hypothesis.
<u>1.482</u>	St. Dev =1.64 Median =1 Mode =0	<ul style="list-style-type: none"> Sources of error identified and explained. Appropriate recommendations made to eliminate errors. 	<ul style="list-style-type: none"> Sources of error identified. 	<ul style="list-style-type: none"> Weak/trivial attempt to identify sources of error.
<u>1.625</u>	St. Dev =1.56 Median =1 Mode =0	<ul style="list-style-type: none"> Student generates specific questions for future study. 	<ul style="list-style-type: none"> Student makes attempt to generate questions for future study. 	<ul style="list-style-type: none"> Student makes incomplete or inappropriate attempt to extend or apply knowledge.
<u>1.720</u>	AVG Conclusions St. Dev =1.51			

Grand Total
Stan. Dev.= 1.067

Grand Total
Mean = 2.258