

Littleton High School: Experimental Design Rubric (EDR)

	Excellent	Proficient	Below Standard
ABSTRACT	<p>The abstract includes:</p> <ul style="list-style-type: none"> a. a clear and focused purpose b. a brief summary of the data collection methods c. a summary of the significant results d. a brief conclusion that correctly interprets the results 	<p>The abstract includes:</p> <ul style="list-style-type: none"> a. a clear and focused purpose b. a brief summary of data collection methods c. a restatement of results without discussion of the significant results d. a conclusion that is loosely based on the results. 	<p>The abstract includes:</p> <ul style="list-style-type: none"> a. an unclear purpose b. a summary of some of the data collection methods c. an incomplete restatement of results d. a conclusion that is not based on the results or no conclusion at all
INTRODUCTION	<p>The introduction provides:</p> <ul style="list-style-type: none"> a. a general overview of the topic of study (par. 1) b. clear, accurate and detailed information explaining the science concepts being investigated (par 2) c. properly cited support that is aligned with science being investigated d. a summary of the purpose and method for data collection (par 3) 	<p>The introduction provides:</p> <ul style="list-style-type: none"> a. a general overview of the topic of study (par. 1) b. information about the science concepts being investigated but lacking detail (par 2) c. properly cited support that is aligned with science being investigated d. a summary of the purpose and method for data collection (par 3) 	<p>The introduction provides:</p> <ul style="list-style-type: none"> a. a general overview that is lacking sufficient detail (par. 1) b. some information about science being investigated but lacks detail and/or is inaccurate c. sources that do not align with science being investigated or no cited sources d. no summary of purpose
PURPOSE	<p>The problem statement:</p> <ul style="list-style-type: none"> a. states an accurate purpose for the experiment b. accurately identifies all independent and dependent variables c. accurately identifies significant conditions held constant 	<p>The problem statement:</p> <ul style="list-style-type: none"> a. states an accurate purpose for the experiment b. identifies the independent and dependent variables but one or more are inaccurate c. may or may not include constants 	<p>The problem statement:</p> <ul style="list-style-type: none"> a. states a purpose for the experiment b. does not identify independent or dependent variables c. does not identify constants
HYPOTHESIS	<p>The hypothesis:</p> <ul style="list-style-type: none"> a. states the effect the independent variable will have on the dependent variable(s) b. explains, scientifically, why the independent variable will have this affect on the dependent variable(s) c. includes properly cited support for explanation from an outside source 	<p>The hypothesis:</p> <ul style="list-style-type: none"> a. states the effect the independent variable will have on the dependent variable(s) b. provides illogical or non-scientific explanation for why the independent variable will affect the dependent variable c. is missing properly cited support 	<p>The hypothesis:</p> <ul style="list-style-type: none"> a. states the effect the independent variable will have on the dependent variable(s) b. does not explain why the independent variable affects the dependent variable c. is missing properly cited support
DESIGN	<p>The design includes:</p> <ul style="list-style-type: none"> a. a detailed materials/equipment list b. safety guidelines c. a procedure which provides: <ul style="list-style-type: none"> * numbered steps in a logical order * detailed instructions for quantitative/qualitative data collection * instructions for multiple trials * instructions to test control when appropriate d. labeled diagram(s) 	<p>The design includes:</p> <ul style="list-style-type: none"> a. a materials/equipment list b. safety guidelines c. a procedure which provides: <ul style="list-style-type: none"> * numbered steps in a logical order * some instructions for quantitative/qualitative data collection (may not be clear) * instructions for multiple trials are missing or steps to test control are missing d. diagram incomplete or not labeled 	<p>The design includes:</p> <ul style="list-style-type: none"> a. a materials/equipment list b. safety guidelines c. a procedure which provides: <ul style="list-style-type: none"> * numbered steps (some steps missing) * instructions for data collection is not addressed or is not clear * instructions for multiple trials are missing * steps to test control are missing d. no diagram
RESULTS/DATA	<p>The data table includes:</p> <ul style="list-style-type: none"> a. a title that reflects all variables b. straight borders, columns, and rows c. all appropriate labels and units d. all qualitative and quantitative data e. accurate degree of uncertainty f. independent variable on left and dependent variables across the top 	<p>The data table includes:</p> <ul style="list-style-type: none"> a. a title that reflects all variables b. straight borders, columns, and rows c. most of the appropriate labels and units d. all qualitative and quantitative data e. accurate degree of uncertainty 	<p>The data table includes:</p> <ul style="list-style-type: none"> a. a title b. borders, columns, and rows that are not straight or are missing c. most of the appropriate labels and units d. most of the data e. no degree of uncertainty

CALCULATIONS	Excellent	Proficient	Below Standard
	<p>The calculation section includes:</p> <ul style="list-style-type: none"> a. calculations that are useful for evaluating data b. a label for each type of calculation c. a word formula for each type of calculation d. all work shown e. accurate answers with correct sig figs f. an appropriate unit on each answer 	<p>The calculation section includes:</p> <ul style="list-style-type: none"> a. calculations that are useful for evaluating data b. labels for most of the calculations c. a word formula for most of the calculations d. most of the work shown e. accurate answers with correct sig figs f. most answers with appropriate units 	<p>The calculation section is missing 3 or more of the following:</p> <ul style="list-style-type: none"> a. calculations that are useful for evaluating data b. a label for each type of calculation c. a word formula d. some or no work shown e. mostly accurate calculations f. some answers with appropriate units
GRAPHS	Excellent	Proficient	Below Standard
	<p>The graph includes:</p> <ul style="list-style-type: none"> a. a title which includes all variables and reflects their relationship b. axes with correct labels and units c. dependent variable on the y-axis and independent variable on the x-axis d. properly scaled axes e. accurately plotted data points f. appropriate graphing style g. at least 2/3 of grid used 	<p>The graph includes:</p> <ul style="list-style-type: none"> a. a title with all variables b. axes with correct labels and units c. dependent variable on the y-axis and independent variable on the x-axis d. properly scaled axes e. accurately plotted data points f. graphing style that is not appropriate g. less than 2/3 of grid used 	<p>The graph is missing 3 or more of the following:</p> <ul style="list-style-type: none"> a. a title b. axes with correct labels and units c. dependent variable on the y-axis and independent variable on the x-axis d. properly scaled axes e. accurately plotted data points f. appropriate graphing style g. at least 2/3 of grid used
CONCLUSION, AND EVALUATION OF RESULTS	Excellent	Proficient	Below Standard
	<p>The conclusion describes what happened:</p> <ul style="list-style-type: none"> a. restates the purpose b. describes relationship between variables c. supports relationship using data collected in the lab d. restates the prediction in the hypothesis and states whether it was supported or rejected based on results (refer to graph, calculations or data) 	<p>The analysis (tells what the results are):</p> <ul style="list-style-type: none"> a. restates purpose b. identifies patterns/trends in data c. does not support pattern/trend with qualitative/quantitative data collected from the lab or only lists data collected 	<p>The analysis (tells what the results are):</p> <ul style="list-style-type: none"> a. restates purpose b. lists data collected from the lab but does not identify a pattern/trend in the data
	<p>The conclusion explains what happened:</p> <ul style="list-style-type: none"> a. explains the results using science terminology and principles (explain why the results agree/disagree with scientific principles) b. supports explanation with reliable, published source c. compares results to published / accepted values c. properly cites outside sources with parenthetical references and include in works cited 	<p>The conclusion (tells what the results mean):</p> <ul style="list-style-type: none"> a. restates hypothesis and states whether it was supported or rejected, but may not refer to results. b. attempts to explain what happened but does not use science terminology/principles in explanation or does not compare to published values c. Properly cites outside source used to support explanation 	<p>The conclusion(tells what the result mean):</p> <ul style="list-style-type: none"> a. the hypothesis is restated but is not supported or rejected with results. b. does not explain what happened or explanation is inaccurate c. outside source is not used to support explanation or is not properly cited
	Excellent	Proficient	Below Standard
<p>The evaluation (validity of results):</p> <ul style="list-style-type: none"> a. identifies logical sources of error b. explains effect of error on results c. discusses validity of results based on % error or comparison of class data and/ or external scientific studies d. suggests logical improvements based on identified errors e. suggests reasonable further study 	<p>The evaluation (validity of results):</p> <ul style="list-style-type: none"> a. identifies logical sources of error b. does not explain effect of error on results c. does not discuss validity of results based on % error or comparison of class data or external scientific studies d. suggests logical improvements e. suggests reasonable further study 	<p>The evaluation (validity of results):</p> <ul style="list-style-type: none"> a. identifies sources of error but errors are not logical b. does not explain effect of error on results c. does not discuss validity of results d. does not suggest logical improvements e. does not suggest further study 	
WKS. CIT	Excellent	Proficient	Below Standard
	<p>Citations include:</p> <ul style="list-style-type: none"> a. Parenthetical Reference within the text of the report b. proper APA citation for each source 	<p>Citations include:</p> <ul style="list-style-type: none"> a. Parenthetical Reference within the text of the report b. APA citation for each source 	<p>Citations include:</p> <ul style="list-style-type: none"> a. Parenthetical Reference is missing within the text of the report b. improper or missing APA citations