AP Biology 12 – **Investigation 13 – Enzyme Activity**  Assessed by: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Bl:\_\_

***Assessment Criteria:*** *Please highlight evidence according to the performance standards below*

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| --- | --- | --- | --- | --- |
| ***Overall*** | **Beginning** | **Developing** | **Accomplished** | **Exemplary** |
| **Experimental Design** | * Introduction is missing * Hypothesis is missing * Most variables are missing and/or incorrectly identified * There is no attempt at including appropriate controls and/or repetition | * Introduction is present but lacks depth and citations * Hypothesis is stated but not appropriate * Almost all variables identified correctly (dependent, independent, constants) * There is an attempt at including appropriate controls and/or repetition, but they are incorrect | * Introduction provides some background for the research lacks citations * Hypotheses is stated (if, then) but incomplete (no because) * All variables identified correctly (dependent, independent, constants), but lacking in clarity * Controls and repetition are included but and are almost appropriate to the experiment | * Detailed Introduction providing background for the research with citations * Hypotheses is stated  (if, then, because) * All variables clearly and correctly identified (dependent, independent, constants) * Appropriate controls and repetition correctly described |
| **Graph and data tables**  *Please refer to Appendix B in AP Investigative Lab Manual* | * Title is missing or incorrect * X & Y axis are not properly placed (independent and dependant variables are switched) * Data points are not plotted correctly * Choice of bar graph and/or best fit line/curve is not appropriate for the data      * Graph is not neat or clear and/or space is not used effectively | * Title incorporates “Y vs X,” but missing units and/or relevant information * X & Y axis   + Has independent/dependent variable labelled but is missing units * Data points are *somewhat* correctly plotted with dot and circle * Appropriate bar or best-fit line/curve graph type is chosen, however, best fit line/curve *does not* accurately depict the data plots (watch out for inappropriately including a “zero”) * *Somewhat* neat and clear with ruler used; space is somewhat used effectively | * Title incorporates “Y vs X” and units, but missing other relevant information * X & Y axis   + Has independent/dependent variable labelled with units, but interval scale is not completely uniform * Data points *mostly* correctly plotted with dot and circle, clearly marked with standard error bars and legend if appropriate * Appropriate bar or best-fit line/curve graph type is chosen, however, line/curve *almost* accurately depicts the data plots (watch out for inappropriately including a “zero”) * *Mostly* neat and clear with ruler used; space is mostly used effectively | * Complete, clear, informative title that incorporates “Y vs X” and units * X & Y axis   + Independent/Dependent variable   + Labelled with units   + Uniform interval scale * Data points *correctly* plotted with dot and circle, clearly marked with standard error bars and legend if appropriate * Appropriate graph type is chosen   + Bar for discreet data or best-fit line/curve graphs for continuous data   + Line/curve of best fit represents data plots * Neat and clear with ruler used; space used effectively |
| **Conclusion** | * Hypothesis and/or results not referred to      * No sources of error * Does not discuss relevance | * Refers to purpose, summarizes results without insight      * Sources of error not relevant * Relevance inappropriate | * Answers purpose by summarizing results * States 1-2 relevant sources of error * Reveals relevance of results | * Answers purpose by comparing key results to objectives and predictions/hypothesis (supported/not supported/rejected) * States 2 or more insightful sources of error and suggests improvements * Connects to big picture (relevance) * Asks new questions and suggests new experiments for the future |
| **Works Cited** | * Citations are not properly used in APA formatting * Citations do not support the text in an appropriate way * Works cited is not correctly formatted and in APA formatting * Citations are missing altogether | * Some citations are properly used in APA formatting * Some citations support the text in an appropriate way * Works cited is not correctly formatted and in APA formatting * Less than 2 different sources | * Most citations are properly used in APA formatting * Most citations support the text in an appropriate way * Works cited is not correctly formatted and in APA formatting * Less than 3 different sources | * Citations are properly used in APA formatting * Citations support the text in an appropriate way * Works cited is correctly formatted and in APA formatting * At least 3 different sources |

Brady 2018 *adapted from* Wood 2014