**Physics Ball Bounce Lab Report Rubric**

**Lab: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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| **Table of Contents** | **Points Earned** | **Points Possible** |
| * Includes the title, page numbers, and date of experiment |  | 1 |
| **Title** |  |  |
| * Capitalized appropriately, relates to the experiments, underlined at the top of the lab report |  | 1 |
| **Question** |  |  |
| * Testable and clearly stated |  | 1 |
| * Independent variable, dependent variables, constants (at least 3) and the control are stated |  | 3 |
| **Hypothesis** |  |  |
| * States what you are doing, what you predict will happen, and why you think that will happen. If…Then…Because |  | 1 |
| **Materials** |  |  |
| * A list of all materials used in the experiment |  | 1 |
| **Procedure** |  |  |
| * Write a complete, **DETAILED** procedure. If necessary, include a sketch of the lab setup. Must be valid, limited to one variable at a time, clear and concise. |  | 10 |
| **Data** |  |  |
| * Organized table that shows the data you have collected during the experiment   + - Include an appropriate title     - Clearly organize and label data columns and rows     - Units are clearly identified     - Accuracy of data is appropriate to measuring equipment or instruments     - Data from multiple trials is clearly shown     - Data and table lines are neat and presentable (USE A RULER) |  | 3 |
| **Analysis** |  |  |
| * Find the average, percent error or percent yield and standard deviation (shows the calculations and steps taken to arrive at those answers.) Check for outliers and discard if necessary. |  | 4 |
| * Graph   + - Appropriate type of graph is used     - Include appropriate title for the graph     - Label both axes including units     - Scale for axes is appropriate for range of data     - Colors, symbols, labels, etc. are employed to make the graph easier to read. Key is included.     - Data are plotted accurately     - Graph is neat and presentable (USE A RULER) |  | 10 |

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| **Conclusion** |  |  |
| * In the first sentence, summarize your results. Then state whether or not your hypothesis was supported by the data and give **specific details** to prove it. Explain why you think it turned out that way. Is the experimental value different from the theoretical value? Do the results make sense given what you already know? How might the methods you used bias your results? Report the ACTUAL NUMBERS you calculated your average results to be and give a measure of certainty (standard deviation or percent error) with each measurement. |  | 4 |
| Error Analysis: Discuss how the 4 types of errors may have influenced the outcome of your experiment. Be sure to tell what direction (too high or too low) the error skewed your data.   * Random: natural and unpredictable fluctuations in natural phenomena (for instance, temperature in one location or a beaker may vary slightly from another). * Environmental: effects of temperature, light, humidity, atmospheric pressure, wind speed, etc that may have had an influence on the outcome of an experiment. * Instrumental: Every instrument has limitations of accuracy and precision. A measurement is only valid to the lowest possible marking on the instrument, then a best guess is made for the next digit. * Personal: Human limitations that influence the outcome of an experiment, for instance, reaction time when using a stopwatch. Making a mistake in measurements or calculations, not cleaning glassware or calibrating an instrument would NOT be considered personal error; they are mistakes that should be corrected. |  | 4 |
| * Discuss how to change the design to fix the errors. What further questions or investigations does this lead to? Suggest relevant changes and other experiments to improve understanding of the subject. |  | 2 |
| **Discussion/Reflection** |  |  |
| * Discuss what you learned from this experiment and how it relates to what we are learning in class and applications in the real world (your world). Examples: Medicine, Pharmacy, Industry, Technology, Mining |  | 2 |
| * Explain how the theoretical concepts we are learning in class directly apply to the lab experience. What Theories/ Laws are involved? How did this lab verify or deviate from them? |  | 2 |
| **Total Score** |  |  |