Wave Basics Notebook - Scoring Rubric

Your notebook will be collected at the end of class on _____, _____ _____.
The following items should be in your notebook. They should be clearly organized and easy to find. *Auxilliary items* should be taped, glued or stapled into the notebook in the appropriate location; they should not be *hanging loose*. Use an organizational system and label all work. Each lab will be graded separately. Nine Wave Basics lab grades will be entered into the gradebook. An overall notebook grade will be determined based on your use of the notebook as an organized and effective record-keeping tool which documents your engagement in the learning cycle during classtime and labtime.

Name: _____ Period: _____

Item		Score
W1.	**A Wiggle in Time Lab** ____ Included, labeled and organized all parts of the lab report. ____ Data section includes plots of position-time and velocity-time. Plots are complete and reasonable representations of the motion. ____ Conclusion/Discussion provides a simple description of the mass's motion, a description of how the position and the velocity change with respect to the time; a *mathematical language* is used in the description.	_____/3 (Lab score)
W2.	**Period of a Pendulum Lab** ____ Included, labeled and organized all parts of the lab report. ____ Data section includes several tables of data – one for each variable; column headings and units are stated. Data appear to be systematically collected ; controlled the variables well. Data appear accurate. Included a graph of period versus the independent variable (the one which has an effect on the period). Performed power regression, recorded the statistics (A, B, power and R) and wrote the equation; avoided y and x in the equation and used symbols of actual variables being studied. ____ Conclusion identifies the variables effecting and not effecting the period and identifies the equation relating the period to the length of the pendulum. Defined symbols used in the equation. ____ Discussion of Results explains why the variables not effecting the period were ruled out; references data to support the conclusion. Identified the experimentally-derived equation relating the period to the length. An error analysis is performed to evaluate reliability of equation; compares equation to that found in the textbook or other locations. Performs percent errors for the coefficient value and the power value.	_____/8 (Lab score)
W3.	**A Wiggle in Time and Space Lab** ____ Included, labeled and organized all parts of the lab report. ____ Data section includes observations pertaining to particle motion and wave motion for transverse waves; might be complemented by a well-labeled diagram. Observations are clearly written and relevant to the question proposed in the Purpose. ____ Conclusion/Discussion includes a well-written paragraph in which wave motion is compared to the motion of a mass on a spring. Ways in which they are similar or different is discussed.	_____/3 (Lab score)
W4.	**Wave Motion Lab** ____ Included, labeled and organized all parts of the lab report. ____ Data section includes observations of the three types of wave motion. Well-labeled diagrams are included to differentiate between the particle motion of the three types of waves. Explanations are clearly and accurately worded. Writing is accurate, clear and thorough. ____ Conclusion/Discussion summarizes the way in which the three types of wave motion can be distinguished.	_____/3 (Lab score)

W5. Speed of a Wave Lab ____ Included, labeled and organized all parts of the lab report. ____ Data section includes the provided data table; organized and accurate calculations are clearly shown for the requested rows. Standing wave patterns are clearly drawn. Calculations are accurate and complete. ____ Conclusion accurately states the variables which do and do not effect the wave speed. ____ Discussion of Results provides the logical support for the conclusion. References specific results to show how there is a non-effect or an effect of a changing variable upon the wave speed. Uses good logic and good writing.	_____/6 (Lab score)
W6. Vibrating Spring Lab ___ Included, labeled and organized all parts of the lab report. ___ Data section includes nodal spacing distance and frequency data for the spring; organized in a table with column headings and units indicated. An analysis of the data is clearly evident; this analysis may be in the form of a graph (with power regression or linear regression statistics clearly reported), a trial-and-error number-crunching routine (multiplying, dividing, raising to a power, etc.) ___ Conclusion answers the *question* posed in the Purpose. The mathematical equation determined by the analysis is reported; symbols in the equation are defined. The relationship between the two variables is described in words - e.g., direct, inverse, linear, power, etc. ___ Discussion of Results explains the meaning of the equation; the equation is related to the wave equation; the distance between adjacent nodes is related to the wavelength; the meaning of any constant numerical values within the equation are discussed. The discussion is complete, thorough, and reveals both effort and understanding.	_____/8 (Lab score)
W7. Nodes and Antinodes Lab ___ Included, labeled and organized all parts of the lab report. ___ Data section includes a table of data organized in a row-column format; column headings and units are provided. Some form of numerical analysis is evident. If a linear regression analysis is used, a sample plot with statistical data is provided. If trial-and-error equation fitting is used, a clear documentation of unsuccessful and successful efforts is provided. (Scratchouts, wrong turns, and scribbles are expected.) All efforts to determine the equation reveal good logic and problem-solving ability; documentation is thorough. ___ Conclusion/Discussion reports the equation which best fits the data. The evidence which logically supports the equation is thoroughly discussed. The equation is relatively accurate and consistent with the data. An error analysis is provided: the degree of certainty with the equation is discussed; possible alternative equations are mentioned.	_____/6 (Lab score)
W8. Harmonic Frequencies Lab ____ Included, labeled and organized all parts of the lab report. ____ Data section includes a table with harmonic number, wave pattern, and frequency. Stated column headings and units. Data is reasonably accurate. ____ Conclusion includes a couple of well-written sentences to introduce the mathematical equation which relates the various harmonic frequencies. Meaning of symbols within the equation are defined. ____ Discussion of Results explains the logical connection between the collected data and the stated equation. Discusses specific results to show how the equation fits the data.	_____/4 (Lab score)
W9. Wave Behavior Demonstration Lab ____ Included, labeled and organized all parts of the lab report. ____ Data section includes several sections in which meaningful observations are recorded to describe the various behavior of waves. Labeled diagrams were included where appropriate; diagrams are clear and informative. ____ Conclusion/Discussion provides a thorough description of each behavior using	_____/4 (Lab score)

well-written sentences and paragraphs. Details regarding when the behavior occurs, what the behavior involves and how the behavior occurs are addressed. Demonstrated a meaningful understanding of wave behavior.	
W10. Use of Notebook as a Record-Keeping Tool Ideally, a student would use the notebook to record notes from class lectures, post-lab sections, textbook readings, etc. Answers and discussions of opening questions are provided. The notebook is a record of the involvement of a scientist/student in both class and lab. A blank or even sparsely-used notebook with little evidence of involvement in class is not a sign of a student who has used the notebook to document and record their involvement in class. A diligent student keeps careful records which subsequently become an effective and useful learning tool.	_____/6 (HW score)