Work and Energy 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. Use an organizational system and label all work. Each lab will be graded separately. Twelve Work and Energy 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
E1. It's All Uphill Lab ____ Included, labeled and organized all parts of the lab report. ____ Data section includes provided table and graph. Data are reasonably accurate. Graph is accurately completed. An organized and labeled sample calculation is provided. ____ Conclusion/Discussion answers the *question* posed in the Purpose; *answer* is consistent with collected data and the graph; conclusion is correct. Reference to the Data section is made in an effort to explain the evidence which supports the conclusion.	_____/5 (Lab score)
E2. It's All Uphill – The Sequel Lab ____ Included, labeled and organized all parts of the lab report. ____ Data section includes a table of collected and calculated data organized in rows and columns; units are indicated. A sample calculation is shown for each type of calculation. Data is reasonably accurate. A plot of work vs. height is sketched; slope, y-intercept and regression constant are reported. ____ Conclusion/Discussion reports the equation relating work and height and describes the qualitative relationship. Reference is made to the data and graphical information in an effort to support the conclusion.	_____/5 (Lab score)
E3. Powerhouse Lab ____ Included, labeled and organized all parts of the lab report. ____ Data section includes a table of both measured and calculated data for walking and running; data is organized in labeled columns; units are stated. Data are relatively accurate. Work is shown and labeled for each type of calculation. ____ Conclusion answers the *question* posed in the Purpose; *answer* is reasonable; units are stated.	_____/3 (Lab score)
E4. Marble Energy Lab ____ Included, labeled and organized all parts of the lab report. ____ Data section includes a sketch of the experimental setup (before and after); the distances being measured are indicated on the diagram. Included a table of data with labeled columns and units. Included a sketch of plotted data and reported the statistical information (slope, y-intercept and regression constant). ____ Conclusion/Discussion describes the effect of release location upon the distance the *paper plow* is driven. The mathematical equation relating the two variables is reported. Discussed the evidence which supports the conclusion in a logical fashion.	_____/6 (Lab score)
5. Marble Energy II Lab ____ Included, labeled and organized all parts of the lab report. ____ Data section includes a sketch of the experimental setup (before and after); the distances being measured are indicated on the diagram. Included a table of data with labeled columns and units. Included a sketch of plotted data. ____ Conclusion answers the *question* posed in the Purpose; *answer* is correct.	_____/4 (Lab score)

Intelligently discusses the evidence which supports the answers.	
E6. Work-Kinetic Energy Lab ____ Included, labeled and organized all parts of the lab report. ____ Data section includes the provided table. Data are reasonably accurate. Sample calculations are shown for calculated quantities; work is clear. ____ Conclusion/Discussion uses an equation or a mathematical statement which relates the work to the kinetic energy change. Evidence supporting the statement is provided and discussed. The validity of the results in evaluated via an error analysis.	_____/5 (Lab score)
E7. Energy on an Incline Lab ____ Included, labeled and organized all parts of the lab report. ____ The Data section includes the provided table. Work is clearly shown for the KE, PE and TME values. Data are reasonably accurate; all measurements were made after the initial *push*. Energy bar charts are correctly completed. ____ Conclusion/Discussion describes the energy at the five positions. Discussed expectations regarding the energy values and discussed the degree to which expectations matched the results. Might have averaged all TME values and calculated percent differences. Discussion reveals understanding.	_____/6 (Lab score)
E8. Energy of a Pendulum Lab ____ Included, labeled and organized all parts of the lab report. ____ Data section includes a graphic clearly labeling the three locations along the trajectory which were analyzed. Included two tables of data - one for measured data and one for calculated data; column headings and units are clearly provided. Calculations are clearly shown and accurately performed. Measurements are reasonably accurate. ____ Conclusion/Discussion describes the energy at the three positions. Discussed expectations regarding the energy values and discussed the degree to which the expectations matched the results. Averaged all TME values and calculated percent differences for each trial based on the average; work is clearly shown and labeled for one of the trials. Discussion reveals understanding.	_____/7 (Lab score)
E9. Spring Energy Lab ____ Included, labeled and organized all parts of the lab report. ____ Data section includes a graphic clearly labeling the four locations along the trajectory which were analyzed. Included two tables of data - one for measured data and one for calculated data; column headings and units are clearly provided. Calculations are clearly shown and accurately performed. Measurements are reasonably accurate. ____ Conclusion/Discussion describes the energy at the four positions. Discussed expectations regarding the energy values and discussed the degree to which expectations matched the results. Averaged all TME values and calculated percent differences for each trial based on the average; work is clearly shown and labeled for one of the trials. Discussion reveals understanding.	_____/8 (Lab score)
E10. Elastic Cord Spreadsheet Analysis Lab ____ Included, labeled and organized all parts of the lab report. ____ Purpose section includes a succinctly worded statement which clarifies the intention of the study. _____Description of Study section describes details related to how the study was conducted. Independent and dependent variables are discussed. The procedure which was used was related to the purpose. ____ Data section identifies the input variables for all trials; units are stated. Reasonable values were used for all inputs. Relevant output variables are clearly stated in an organized fashion. Included an energy-time plot clearly depicting the changes in the KE, PE_{grav}, PE_{elast} and W over the course of time. ____ Conclusion/Discussion provides the answer to the question posed in the Purpose. Answer is relevant to the purpose and reasonable. Evidence which supports the conclusions are discussed in a rational manner. Included an	_____/15 (Lab score)

intelligently worded discussion of the energy of the object, describing how energy was transformed between forms, conserved or not conserved.	
E11. Stopping Distance Lab ____ Included, labeled and organized all parts of the lab report. ____ Data section includes a table of collected data with column headings and units clearly stated. Included a graph of d vs. v or d vs. v^2 or … ; axes are clearly labeled. Results of a linear or power regression analysis are reported. ____ Conclusion states the mathematical equation relating d and v; used appropriate symbols in the equation. ____ Discussion of Results discusses the theoretical basis for the relationship between d and v; used physics equations and mathematical manipulations to present the expectations. The degree to which theory and experiment agree is discussed. Discussion reveals understanding.	_____/7 (Lab score)
E12. All Work and No Play Lab ____ Included, labeled and organized all parts of the lab report. ____ Data section included an organized table of data with column headings and units; all measured data is included in the table and clearly defined. A sample calculation is provided for each type of calculation; work is labeled and clear. Work and ΔPE values are included in the table. Data are reasonably accurate. ____ Conclusion answers the *question* posed in the Purpose; *answer* is correct and consistent with the Data. ____ Discussion of Results logically discusses how the data supports the conclusion. An error analysis is included. Percent difference calculations are reported; work is clearly shown and labeled for at least one of the calculations.	_____/6 (Lab score)
E13. 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.	_____/10 (HW score)