

## Standards 1, 2, 6, & 7 Quick Checklist

<b><i>Std 1: Mathematical Analysis</i></b>	Date(s)
Use algebra and geometry to describe and compare data.	
Use scaled diagrams to represent and manipulate vector quantities.	
Represent physical quantities in graphical form.	
Construct graphs of real-world data	
Manipulate equations solving for unknowns.	
Use dimensional analysis to confirm algebraic solutions.	
Interpret graphs of real world data to find the relationship between the variables.	
Apply algebraic and geometric concepts and skills to the solution of problems.	
Explain the physical relevance of properties of a graphical representation of real-world data- slope, intercepts, area under the curve.	
<b><i>Std. 1: Scientific Inquiry</i></b>	
Develop extended visual models and mathematical formulations to represent an understanding of natural phenomena	
Clarify ideas through reasoning, research, and discussion	
Evaluate competing explanations and overcome misconceptions	
Design an experiment to investigate the relationship between physical phenomena.	
Use various means of representing and organizing observations (e.g., diagrams, tables, charts, graphs, equations, and matrices) and interpret the organized data.	
Identify possible sources of error in data collection and explain their effects on experimental results.	
Examine collected data to evaluate the reliability of experimental results, including percent error, range, standard deviation, line of best fit, and the use of the correct number of significant digits.	
Assess correspondence between the predicted result contained in the hypothesis and the actual result, and reach a conclusion as to whether or not the explanation on which the prediction was based is supported.	
<b><i>Std 2: Information Systems</i></b>	
Understand and use the more advanced features of word processing, spreadsheets, and database software.	
Knowledge of the impacts and limitations of information systems is essential to its effective and ethical use.	
Information technology can have positive and negative impacts on society, depending on how it is used.	

<b><i>Std 6: Models (common themes)</i></b>	Date(s)
Physical and mathematical models represent the behavior of real-world systems.	
Compare predictions to actual observations, using test models.	
Experimental data can be collected to either validate or reject a model.	
<b><i>Std. 6: Magnitude &amp; Scale</i></b>	
Describe the effects of changes in scale on the functioning of physical, biological, or designed systems.	
Extend their use of powers of ten notation to understanding the exponential function and performing operations with exponential factors.	
Orders of magnitude are used to estimate quantitative results.	
<b><i>Std. 6: Equilibrium &amp; Stability</i></b>	
Describe specific instances of how disturbances might affect a system's equilibrium, from small disturbances that do not upset the equilibrium to larger disturbances (threshold level) that cause the system to become unstable.	
Cite specific examples of how dynamic equilibrium is achieved by equality of change in opposing directions.	
<b><i>Std. 6: Patterns of Change</i></b>	
Use sophisticated mathematical models, such as graphs and equations of various algebraic or trigonometric functions.	
Mathematical models such as graphs and equations can be used to predict the behavior of physical systems.	
Search for multiple trends when analyzing data for patterns, and identify data that do not fit the trends.	
Patterns can be deduced from the organization and presentation of the data.	
Patterns in data can be used to identify and develop models.	
<b><i>Std. 6: Optimization</i></b>	
Determine optimal solutions to problems that can be solved using quantitative methods.	
<b><i>Std. 7: Interdisciplinary Problem Solving</i></b>	
Physics can be used in solving problems on many scales, e.g., local, national, and global.	
Scientific methodology is used to solve real-world problems.	
Collect, analyze, interpret, and present data, using appropriate tools.	
<ul style="list-style-type: none"> <li>• If students participate in an extended, mathematics, science, and technology project, then the students should:               <ul style="list-style-type: none"> <li>➤ work effectively</li> <li>➤ gather and process information</li> <li>➤ generate and analyze ideas</li> <li>➤ observe common themes</li> <li>➤ realize ideas</li> <li>➤ present results</li> </ul> </li> </ul>	

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