

PHYSICS Performance Level Descriptors

<p><b>Scientific Thinking</b></p> <ol style="list-style-type: none"> <li>1. Identify and apply the steps of the scientific method</li> <li>2. Interpret graphs, identify patterns, and use math to express and establish scientific relationships</li> <li>3. Use vectors, dimensional analysis, and scientific notation to make calculations and establish scientific relationships</li> <li>4. Distinguish between dependent and independent variables</li> <li>5. Solve simple problems and use the results to determine the validity of different statements</li> <li>6. Solve multi-step, non-routine problems</li> </ol>	<p><b>Newton's Laws of Motion/Momentum and Gravity</b></p> <ol style="list-style-type: none"> <li>1. Explain and calculate the motion of two-dimensional projectile motion</li> <li>2. Calculate the displacement, velocity, and acceleration of a moving object</li> <li>3. Calculate force, mass, and acceleration based on Newton's Second Law</li> <li>4. Summarize and calculate impulse, and understand its relationship to momentum</li> <li>5. Predict the motion of objects using the Law of Conservation of Momentum</li> </ol>	
<p><b>Linear Motion/Equilibrium and Vectors</b></p> <ol style="list-style-type: none"> <li>1. Describe relative motion using frames of reference</li> <li>2. Apply Newton's Laws to motion problems involving frictional forces</li> <li>3. Explain and calculate motion in two dimensions</li> </ol>	<p><b>Atomic Structure</b></p> <ol style="list-style-type: none"> <li>1. Recall New Mexico's role in nuclear science (e.g., Manhattan Project, WIPP, national laboratories)</li> <li>2. Distinguish between natural and man-made forms of radiation and their applications</li> <li>3. Summarize atomic structure, including the properties and relative sizes of protons, neutrons, electrons, and the structure of isotopes</li> </ol>	<p><b>Energy and Work</b></p> <ol style="list-style-type: none"> <li>1. Identify the different forms of energy</li> <li>2. Describe the relationship between energy, work, and power</li> </ol>
<p><b>Heat Transfer</b></p> <ol style="list-style-type: none"> <li>1. Describe equilibrium in thermal, mechanical, and chemical energy transformations</li> <li>2. Recognize that energy can change from one form to another and that energy is conserved in these changes</li> <li>3. Explain basic kinetic theory</li> <li>4. Explain the direction of heat flow between objects</li> </ol>	<p><b>Waves</b></p> <ol style="list-style-type: none"> <li>1. Calculate and describe wave properties including wavelength, frequency, amplitude, and speed</li> <li>2. Apply the concepts of conservation of energy to simple harmonic motion</li> </ol>	<p><b>Electromagnetic Spectrum</b></p> <ol style="list-style-type: none"> <li>1. Describe how waves interact with matter i.e., reflection, refraction, absorption</li> <li>2. Calculate and describe wave properties including wavelength, frequency, amplitude, and speed.</li> <li>3. Recall the parts of longitudinal and transverse waves</li> </ol>