

**Correlation to Arizona Science Standards  
Curriculum Resource Guide**

Standard #: Standard	Level	Concept	Performance Objective	Investigation Level A	Investigation Level B	Investigation Level C
1SC-P1.PO1 Science as Inquiry	Proficiency	Propose solutions to practical and theoretical problems by synthesizing and evaluating information gained from scientific investigations	Evaluate scientific information for relevance to a given problem	<p><b><i>Car and Ramp</i></b> A-2 Investigations and Experiments</p> <p><b><i>Light and Optics</i></b> A-1 Introduction to Light</p> <p><b><i>Rollercoaster</i></b> A-1 Speed on the Roller Coaster</p>	<p><b><i>Air Rocket</i></b> B-3 Pressure and Speed B-4 The Rocket and Newton's Laws of Motion</p> <p><b><i>Car and Ramp</i></b> B-2 Investigating Speed</p> <p><b><i>Light and Optics</i></b> B-2 Polarization</p> <p><b><i>Rollercoaster</i></b> B-1 Energy and the Rollercoaster B-2 Conservation of Energy B-3 Mass and Motion</p> <p><b><i>Ropes and Pulleys</i></b> B-3 Efficiency</p> <p><b><i>Sound and Waves</i></b> B-1 Sound</p>	<p><b><i>Air Rocket</i></b> C-3 Acceleration and G-forces</p> <p><b><i>Car and Ramp</i></b> C-1 Uniform Accelerated Motion</p> <p><b><i>Rollercoaster</i></b> C-1 Motion on the Roller Coaster</p> <p><b><i>Sound and Waves</i></b> C-4 Sound</p>

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Standard #: Standard	Level	Concept	Performance Objective	Investigation Level A	Investigation Level B	Investigation Level C
1SC-P1.PO2 Science as Inquiry	Proficiency	Propose solutions to practical and theoretical problems by synthesizing and evaluating information gained from scientific investigations	Propose solutions to a problem, based on information gained from scientific investigations	<p><b><i>Car and Ramp</i></b> A-2 Investigations and Experiments A-4 Describing Motion A-5 Gravity</p> <p><b><i>Electric Motor</i></b> A-4 Designing Motors</p> <p><b><i>Gears and Levers</i></b> A-4 Designing Gear Machines</p> <p><b><i>Light and Optics</i></b> A-1 Introduction to Light</p> <p><b><i>Marble Launcher</i></b> A-1 Launch Angle and Distance A-2 Launch Speed and Distance</p> <p><b><i>Pendulum</i></b> A-2 Making a Clock</p> <p><b><i>Rollercoaster</i></b> A-2 Height on the Roller Coaster</p> <p><b><i>Ropes and Pulleys</i></b> A-1 Ropes and Pulleys A-2 What is Work?</p>	<p><b><i>Air Rocket</i></b> B-3 Pressure and Speed B-4 The Rocket and Newton's Laws of Motion</p> <p><b><i>Car and Ramp</i></b> B-2 Investigating Speed B-3 Using a Scientific Model to Predict Speed B-4 Position and Time B-5 Acceleration</p> <p><b><i>Electric Circuits</i></b> B-3 Ohm's Law</p> <p><b><i>Electric Motor</i></b> B-3 The Electric Motor</p> <p><b><i>Gears and Levers</i></b> B-3 Compound Gear Machines</p> <p><b><i>Light and Optics</i></b> B-2 Polarization</p> <p><b><i>Rollercoaster</i></b> B-1 Energy and the Rollercoaster B-3 Mass and Motion</p> <p><b><i>Ropes and Pulleys</i></b> B-1 Forces in Machines B-2 Work and Energy B-3 Efficiency</p> <p><b><i>Sound and Waves</i></b> B-1 Sound</p>	<p><b><i>Air Rocket</i></b> C-3 Acceleration and G-forces</p> <p><b><i>Electric Motor</i></b> C-1 Introduction to the Electric Motor</p> <p><b><i>Light and Optics</i></b> C-1 Light and Color</p> <p><b><i>Marble Launcher</i></b> C-2 Improving the Range Equation</p> <p><b><i>Rollercoaster</i></b> C-1 Motion on the Roller Coaster C-3 Mass, Motion, and Energy</p> <p><b><i>Ropes and Pulleys</i></b> C-1 Simple and Complex Pulley Systems</p>

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1SC-P2.PO1 Science as Inquiry	Proficiency	Compare observations of the real world to observations of a constructed model (e.g., an aquarium, a terrarium, a volcano)	Assess the capability of a model to represent a "real world" scenario	<p><b><i>Car and Ramp</i></b> A-4 Describing Motion</p> <p><b><i>Gears and Levers</i></b> A-1 The Lever A-2 Gears</p> <p><b><i>Gravity Drop</i></b> A-3 Falling Motion</p> <p><b><i>Marble Launcher</i></b> A-1 Launch Angle and Distance A-2 Launch Speed and Distance</p> <p><b><i>Pendulum</i></b> A-1 The Pendulum</p> <p><b><i>Rollercoaster</i></b> A-2 Height on the Roller Coaster</p> <p><b><i>Ropes and Pulleys</i></b> A-1 Ropes and Pulleys A-2 What is Work?</p> <p><b><i>Sound and Waves</i></b> A-1 Sound</p>	<p><b><i>Air Rocket</i></b> B-2 Motion of the Air Rocket B-3 Pressure and Speed B-4 The Rocket and Newton's Laws of Motion</p> <p><b><i>Car and Ramp</i></b> B-3 Using a Scientific Model to Predict Speed B-4 Position and Time B-5 Acceleration B-6 Force, Mass, and Acceleration B-7 Weight, Gravity, and Friction</p> <p><b><i>Electric Circuits</i></b> B-3 Ohm's Law</p> <p><b><i>Gears and Levers</i></b> B-1 Levers, Torque and Mechanical Advantage B-2 Gears and Rotating Motion B-4 Machines with Gears and Levers</p> <p><b><i>Gravity Drop</i></b> B-2 Speed, Acceleration, and Free Fall B-3 Newton's Second Law</p> <p><b><i>Light and Optics</i></b> B-2 Polarization B-4 Ratios</p> <p><b><i>Marble Launcher</i></b> B-1 Launch Angle and Range B-2 Launch Speed and Range B-3 Relating Launch Speed and Range</p> <p><b><i>Pendulum</i></b> B-1 Harmonic Motion</p>	<p><b><i>Air Rocket</i></b> C-3 Acceleration and G-forces</p> <p><b><i>Car and Ramp</i></b> C-1 Uniform Accelerated Motion C-2 Newton's Second Law and Friction C-3 The Physics of the Inclined Plane</p> <p><b><i>Electric Circuits</i></b> C-1 Series Circuits</p> <p><b><i>Electric Motor</i></b> C-2 Optimizing Performance</p> <p><b><i>Gears and Levers</i></b> C-2 The Center of Gravity and Equilibrium</p> <p><b><i>Gravity Drop</i></b> C-1 Speed, Acceleration, and Free Fall C-2 Measuring Gravity C-3 Interpreting Graphs of Accelerated Motion</p> <p><b><i>Light and Optics</i></b> C-5 Geometric Optics C-6 The Thin Lens Equation</p> <p><b><i>Marble Launcher</i></b> C-1 Projectile Motion and the Range Equation C-2 Improving the Range Equation</p> <p><b><i>Pendulum</i></b> C-1 Energy Conservation and the Pendulum C-2 Newton's Second Law and the Pendulum C-3 The Physical Pendulum</p> <p><b><i>Rollercoaster</i></b></p>

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Standard #: Standard	Level	Concept	Performance Objective	Investigation Level A	Investigation Level B	Investigation Level C
					B-2 The Five Second Pendulum <b>Rollercoaster</b> B-1 Energy and the Rollercoaster B-2 Conservation of Energy B-3 Mass and Motion <b>Ropes and Pulleys</b> B-1 Forces in Machines B-2 Work and Energy <b>Sound and Waves</b> B-1 Sound	C-1 Motion on the Roller Coaster C-2 Rotational Kinetic Energy C-3 Mass, Motion, and Energy <b>Ropes and Pulleys</b> C-1 Simple and Complex Pulley Systems <b>Sound and Waves</b> C-1 Standing Waves C-3 Natural Frequency and Resonance C-4 Sound
1SC-P3.PO1 Science as Inquiry	Proficiency	Analyze and evaluate reports of scientific studies	Analyze reports of scientific studies for elements of experimental design	<b>Car and Ramp</b> A-2 Investigations and Experiments <b>Gravity Drop</b> A-1 Introduction to the Gravity Drop <b>Pendulum</b> A-1 The Pendulum A-2 Making a Clock <b>Rollercoaster</b> A-1 Speed on the Roller Coaster	<b>Air Rocket</b> B-3 Pressure and Speed B-4 The Rocket and Newton's Laws of Motion <b>Car and Ramp</b> B-2 Investigating Speed <b>Pendulum</b> B-1 Harmonic Motion <b>Rollercoaster</b> B-3 Mass and Motion <b>Ropes and Pulleys</b> B-3 Efficiency	<b>Air Rocket</b> C-3 Acceleration and G-forces <b>Pendulum</b> C-1 Energy Conservation and the Pendulum <b>Rollercoaster</b> C-1 Motion on the Roller Coaster

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1SC-P3.PO2 Science as Inquiry	Proficiency	Analyze and evaluate reports of scientific studies	Compare conclusions to original hypotheses	<p><b><i>Car and Ramp</i></b> A-2 Investigations and Experiments A-4 Describing Motion A-5 Gravity</p> <p><b><i>Light and Optics</i></b> A-1 Introduction to Light</p> <p><b><i>Marble Launcher</i></b> A-1 Launch Angle and Distance A-2 Launch Speed and Distance</p> <p><b><i>Rollercoaster</i></b> A-2 Height on the Roller Coaster</p> <p><b><i>Ropes and Pulleys</i></b> A-1 Ropes and Pulleys A-2 What is Work?</p>	<p><b><i>Car and Ramp</i></b> B-2 Investigating Speed B-3 Using a Scientific Model to Predict Speed B-4 Position and Time B-5 Acceleration</p> <p><b><i>Electric Circuits</i></b> B-3 Ohm's Law</p> <p><b><i>Light and Optics</i></b> B-2 Polarization</p> <p><b><i>Rollercoaster</i></b> B-2 Conservation of Energy B-3 Mass and Motion</p> <p><b><i>Ropes and Pulleys</i></b> B-1 Forces in Machines B-2 Work and Energy</p> <p><b><i>Sound and Waves</i></b> B-1 Sound</p>	<p><b><i>Light and Optics</i></b> C-1 Light and Color</p> <p><b><i>Marble Launcher</i></b> C-2 Improving the Range Equation</p> <p><b><i>Rollercoaster</i></b> C-1 Motion on the Roller Coaster C-3 Mass, Motion, and Energy</p> <p><b><i>Ropes and Pulleys</i></b> C-1 Simple and Complex Pulley Systems</p>
1SC-P3.PO3 Science as Inquiry	Proficiency	Analyze and evaluate reports of scientific studies	Evaluate validity of conclusions	<p><b><i>Car and Ramp</i></b> A-2 Investigations and Experiments</p> <p><b><i>Rollercoaster</i></b> A-1 Speed on the Roller Coaster</p>	<p><b><i>Car and Ramp</i></b> B-2 Investigating Speed</p> <p><b><i>Sound and Waves</i></b> B-1 Sound</p>	<p><b><i>Car and Ramp</i></b> C-1 Uniform Accelerated Motion</p> <p><b><i>Sound and Waves</i></b> C-4 Sound</p>

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1SC-P4.PO1 Science as Inquiry	Proficiency	Create and defend a written plan of action for a scientific investigation	Design an appropriate protocol (written plan of action) for the investigation of a scientific problem	<p><b><i>Car and Ramp</i></b> A-2 Investigations and Experiments A-3 Speed</p> <p><b><i>Gravity Drop</i></b> A-3 Falling Motion</p> <p><b><i>Light and Optics</i></b> A-3 Rules of Reflection</p> <p><b><i>Marble Launcher</i></b> A-1 Launch Angle and Distance</p> <p><b><i>Pendulum</i></b> A-2 Making a Clock</p> <p><b><i>Rollercoaster</i></b> A-1 Speed on the Roller Coaster A-2 Height on the Roller Coaster</p>	<p><b><i>Air Rocket</i></b> B-3 Pressure and Speed B-4 The Rocket and Newton's Laws of Motion</p> <p><b><i>Car and Ramp</i></b> B-2 Investigating Speed B-7 Weight, Gravity, and Friction</p> <p><b><i>Gravity Drop</i></b> B-1 Introduction to the Gravity Drop</p> <p><b><i>Pendulum</i></b> B-1 Harmonic Motion</p> <p><b><i>Rollercoaster</i></b> B-1 Energy and the Rollercoaster B-2 Conservation of Energy B-3 Mass and Motion</p> <p><b><i>Ropes and Pulleys</i></b> B-3 Efficiency</p>	<p><b><i>Air Rocket</i></b> C-3 Acceleration and G-forces</p> <p><b><i>Car and Ramp</i></b> C-1 Uniform Accelerated Motion C-2 Newton's Second Law and Friction</p> <p><b><i>Pendulum</i></b> C-1 Energy Conservation and the Pendulum</p>

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1SC-P4.PO2 Science as Inquiry	Proficiency	Create and defend a written plan of action for a scientific investigation	Justify the protocol in terms of the elements of experimental design	<p><b><i>Car and Ramp</i></b> A-2 Investigations and Experiments</p> <p><b><i>Gravity Drop</i></b> A-3 Falling Motion</p> <p><b><i>Rollercoaster</i></b> A-1 Speed on the Roller Coaster</p>	<p><b><i>Air Rocket</i></b> B-3 Pressure and Speed B-4 The Rocket and Newton's Laws of Motion</p> <p><b><i>Car and Ramp</i></b> B-2 Investigating Speed B-7 Weight, Gravity, and Friction</p> <p><b><i>Gravity Drop</i></b> B-2 Speed, Acceleration, and Free Fall</p> <p><b><i>Marble Launcher</i></b> B-1 Launch Angle and Range</p> <p><b><i>Rollercoaster</i></b> B-1 Energy and the Rollercoaster B-2 Conservation of Energy B-3 Mass and Motion</p> <p><b><i>Ropes and Pulleys</i></b> B-3 Efficiency</p>	<p><b><i>Air Rocket</i></b> C-3 Acceleration and G-forces</p> <p><b><i>Car and Ramp</i></b> C-2 Newton's Second Law and Friction</p> <p><b><i>Gravity Drop</i></b> C-1 Speed, Acceleration, and Free Fall</p>

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1SC-P5.PO1 Science as Inquiry	Proficiency	Apply the concepts of equilibrium, form and function to a variety of phenomena	Predict the effects of various factors on the equilibrium of a system	<p><b>Electric Circuits</b> A-3 Current and Voltage</p> <p><b>Light and Optics</b> A-3 Rules of Reflection</p> <p><b>Marble Launcher</b> A-1 Launch Angle and Distance A-2 Launch Speed and Distance</p>	<p><b>Car and Ramp</b> B-3 Using a Scientific Model to Predict Speed</p> <p><b>Electric Circuits</b> B-1 Voltage B-2 Current</p> <p><b>Gravity Drop</b> B-2 Speed, Acceleration, and Free Fall</p> <p><b>Marble Launcher</b> B-1 Launch Angle and Range</p> <p><b>Pendulum</b> B-2 The Five Second Pendulum</p> <p><b>Rollercoaster</b> B-2 Conservation of Energy</p>	<p><b>Car and Ramp</b> C-1 Uniform Accelerated Motion C-3 The Physics of the Inclined Plane</p> <p><b>Electric Circuits</b> C-3 Compound Circuits</p> <p><b>Gravity Drop</b> C-1 Speed, Acceleration, and Free Fall</p> <p><b>Light and Optics</b> C-1 Light and Color C-5 Geometric Optics C-6 The Thin Lens Equation</p> <p><b>Rollercoaster</b> C-1 Motion on the Roller Coaster C-2 Rotational Kinetic Energy</p>

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1SC-P6.PO1 Science as Inquiry	Proficiency	Identify and refine a researchable question, conduct the experiment, collect and analyze data, share and discuss findings	Construct a researchable question	<p><b><i>Car and Ramp</i></b> A-2 Investigations and Experiments</p> <p><b><i>Gravity Drop</i></b> A-3 Falling Motion</p> <p><b><i>Light and Optics</i></b> A-1 Introduction to Light A-3 Rules of Reflection</p> <p><b><i>Rollercoaster</i></b> A-1 Speed on the Roller Coaster A-2 Height on the Roller Coaster</p>	<p><b><i>Air Rocket</i></b> B-3 Pressure and Speed B-4 The Rocket and Newton's Laws of Motion</p> <p><b><i>Car and Ramp</i></b> B-2 Investigating Speed B-7 Weight, Gravity, and Friction</p> <p><b><i>Gravity Drop</i></b> B-2 Speed, Acceleration, and Free Fall</p> <p><b><i>Light and Optics</i></b> B-2 Polarization</p> <p><b><i>Marble Launcher</i></b> B-1 Launch Angle and Range</p> <p><b><i>Pendulum</i></b> B-1 Harmonic Motion</p> <p><b><i>Rollercoaster</i></b> B-1 Energy and the Rollercoaster B-2 Conservation of Energy B-3 Mass and Motion</p> <p><b><i>Ropes and Pulleys</i></b> B-3 Efficiency</p>	<p><b><i>Air Rocket</i></b> C-3 Acceleration and G-forces</p> <p><b><i>Car and Ramp</i></b> C-2 Newton's Second Law and Friction</p> <p><b><i>Gravity Drop</i></b> C-1 Speed, Acceleration, and Free Fall</p> <p><b><i>Pendulum</i></b> C-1 Energy Conservation and the Pendulum</p> <p><b><i>Rollercoaster</i></b> C-1 Motion on the Roller Coaster C-3 Mass, Motion, and Energy</p>

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1SC-P6.PO2 Science as Inquiry	Proficiency	Identify and refine a researchable question, conduct the experiment, collect and analyze data, share and discuss findings	Employ a research design that incorporates a scientific method to carry out an experiment	<p><b><i>Car and Ramp</i></b> A-2 Investigations and Experiments</p> <p><b><i>Gravity Drop</i></b> A-1 Introduction to the Gravity Drop A-3 Falling Motion</p> <p><b><i>Light and Optics</i></b> A-3 Rules of Reflection</p> <p><b><i>Pendulum</i></b> A-2 Making a Clock</p> <p><b><i>Rollercoaster</i></b> A-1 Speed on the Roller Coaster A-2 Height on the Roller Coaster</p>	<p><b><i>Air Rocket</i></b> B-3 Pressure and Speed B-4 The Rocket and Newton's Laws of Motion</p> <p><b><i>Car and Ramp</i></b> B-2 Investigating Speed B-7 Weight, Gravity, and Friction</p> <p><b><i>Gravity Drop</i></b> B-1 Introduction to the Gravity Drop B-2 Speed, Acceleration, and Free Fall</p> <p><b><i>Marble Launcher</i></b> B-1 Launch Angle and Range</p> <p><b><i>Pendulum</i></b> B-1 Harmonic Motion</p> <p><b><i>Rollercoaster</i></b> B-1 Energy and the Rollercoaster B-2 Conservation of Energy B-3 Mass and Motion</p> <p><b><i>Ropes and Pulleys</i></b> B-3 Efficiency</p>	<p><b><i>Air Rocket</i></b> C-3 Acceleration and G-forces</p> <p><b><i>Car and Ramp</i></b> C-2 Newton's Second Law and Friction</p> <p><b><i>Gravity Drop</i></b> C-1 Speed, Acceleration, and Free Fall</p> <p><b><i>Pendulum</i></b> C-1 Energy Conservation and the Pendulum</p> <p><b><i>Rollercoaster</i></b> C-1 Motion on the Roller Coaster C-3 Mass, Motion, and Energy</p>

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1SC-P6.PO3 Science as Inquiry	Proficiency	Identify and refine a researchable question, conduct the experiment, collect and analyze data, share and discuss findings	Analyze experimental data	<p><b><i>Car and Ramp</i></b> A-1 Time and Distance A-4 Describing Motion A-5 Gravity</p> <p><b><i>Gravity Drop</i></b> A-3 Falling Motion</p> <p><b><i>Marble Launcher</i></b> A-1 Launch Angle and Distance A-2 Launch Speed and Distance</p> <p><b><i>Rollercoaster</i></b> A-2 Height on the Roller Coaster</p> <p><b><i>Ropes and Pulleys</i></b> A-1 Ropes and Pulleys A-2 What is Work?</p>	<p><b><i>Air Rocket</i></b> B-2 Motion of the Air Rocket B-3 Pressure and Speed B-4 The Rocket and Newton's Laws of Motion</p> <p><b><i>Car and Ramp</i></b> B-1 Time and Distance B-3 Using a Scientific Model to Predict Speed B-4 Position and Time B-5 Acceleration B-7 Weight, Gravity, and Friction</p> <p><b><i>Gravity Drop</i></b> B-1 Introduction to the Gravity Drop B-2 Speed, Acceleration, and Free Fall B-3 Newton's Second Law</p> <p><b><i>Light and Optics</i></b> B-4 Ratios</p> <p><b><i>Marble Launcher</i></b> B-1 Launch Angle and Range B-2 Launch Speed and Range</p> <p><b><i>Rollercoaster</i></b> B-1 Energy and the Rollercoaster</p> <p><b><i>Ropes and Pulleys</i></b> B-1 Forces in Machines B-2 Work and Energy</p> <p><b><i>Sound and Waves</i></b> B-1 Sound</p>	<p><b><i>Air Rocket</i></b> C-3 Acceleration and G-forces</p> <p><b><i>Car and Ramp</i></b> C-1 Uniform Accelerated Motion C-2 Newton's Second Law and Friction</p> <p><b><i>Gravity Drop</i></b> C-1 Speed, Acceleration, and Free Fall C-2 Measuring Gravity</p> <p><b><i>Light and Optics</i></b> C-6 The Thin Lens Equation</p> <p><b><i>Marble Launcher</i></b> C-1 Projectile Motion and the Range Equation C-3 Accuracy, Precision, and Error</p> <p><b><i>Pendulum</i></b> C-2 Newton's Second Law and the Pendulum</p> <p><b><i>Rollercoaster</i></b> C-1 Motion on the Roller Coaster C-3 Mass, Motion, and Energy</p> <p><b><i>Ropes and Pulleys</i></b> C-1 Simple and Complex Pulley Systems C-2 Compound Pulley System</p>

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1SC-P6.PO4 Science as Inquiry	Proficiency	Identify and refine a researchable question, conduct the experiment, collect and analyze data, share and discuss findings	Communicate experimental findings to others	<p><b><i>Car and Ramp</i></b> A-4 Describing Motion</p> <p><b><i>Gravity Drop</i></b> A-3 Falling Motion</p> <p><b><i>Marble Launcher</i></b> A-1 Launch Angle and Distance A-2 Launch Speed and Distance</p> <p><b><i>Pendulum</i></b> A-1 The Pendulum</p> <p><b><i>Rollercoaster</i></b> A-2 Height on the Roller Coaster</p> <p><b><i>Sound and Waves</i></b> A-1 Sound</p>	<p><b><i>Air Rocket</i></b> B-2 Motion of the Air Rocket B-3 Pressure and Speed B-4 The Rocket and Newton's Laws of Motion</p> <p><b><i>Car and Ramp</i></b> B-3 Using a Scientific Model to Predict Speed B-4 Position and Time B-5 Acceleration B-6 Force, Mass, and Acceleration B-7 Weight, Gravity, and Friction</p> <p><b><i>Electric Circuits</i></b> B-2 Current B-3 Ohm's Law</p> <p><b><i>Gravity Drop</i></b> B-2 Speed, Acceleration, and Free Fall</p> <p><b><i>Light and Optics</i></b> B-4 Ratios</p> <p><b><i>Marble Launcher</i></b> B-1 Launch Angle and Range B-2 Launch Speed and Range B-3 Relating Launch Speed and Range</p> <p><b><i>Pendulum</i></b> B-1 Harmonic Motion B-2 The Five Second Pendulum</p> <p><b><i>Rollercoaster</i></b> B-1 Energy and the Rollercoaster B-2 Conservation of Energy B-3 Mass and Motion</p>	<p><b><i>Car and Ramp</i></b> C-1 Uniform Accelerated Motion C-2 Newton's Second Law and Friction C-3 The Physics of the Inclined Plane</p> <p><b><i>Electric Circuits</i></b> C-1 Series Circuits</p> <p><b><i>Gravity Drop</i></b> C-1 Speed, Acceleration, and Free Fall C-3 Interpreting Graphs of Accelerated Motion</p> <p><b><i>Marble Launcher</i></b> C-1 Projectile Motion and the Range Equation C-2 Improving the Range Equation</p> <p><b><i>Pendulum</i></b> C-1 Energy Conservation and the Pendulum C-2 Newton's Second Law and the Pendulum C-3 The Physical Pendulum</p> <p><b><i>Rollercoaster</i></b> C-1 Motion on the Roller Coaster C-2 Rotational Kinetic Energy C-3 Mass, Motion, and Energy</p> <p><b><i>Sound and Waves</i></b> C-1 Standing Waves C-3 Natural Frequency and Resonance C-4 Sound</p>

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					<i>Sound and Waves</i> B-1 Sound	
2SC-P1.PO1 History and Nature of Science	Proficiency	Identify and describe key factors (e.g., technology, competitiveness, world events, personalities, societal views) that affect the development and acceptance of scientific thought	Define key factors that affect the development of scientific thought		<i>Light and Optics</i> B-2 Polarization <i>Marble Launcher</i> B-3 Relating Launch Speed and Range <i>Pendulum</i> B-2 The Five Second Pendulum	<i>Gravity Drop</i> C-3 Interpreting Graphs of Accelerated Motion <i>Marble Launcher</i> C-1 Projectile Motion and the Range Equation
2SC-P1.PO2 History and Nature of Science	Proficiency	Identify and describe key factors (e.g., technology, competitiveness, world events, personalities, societal views) that affect the development and acceptance of scientific thought	Describe how different key factors affect the development and acceptance of scientific thought		<i>Light and Optics</i> B-2 Polarization <i>Marble Launcher</i> B-3 Relating Launch Speed and Range <i>Pendulum</i> B-2 The Five Second Pendulum	<i>Gravity Drop</i> C-3 Interpreting Graphs of Accelerated Motion <i>Marble Launcher</i> C-1 Projectile Motion and the Range Equation
2SC-P3.PO1 History and Nature of Science	Proficiency	Explain the impact on society of major scientific developments (e.g., germ theory, molecular biology, relativity)	Describe the benefits, limitations, and consequences of major scientific developments in pure and applied science		<i>Atom Building Game</i> B-2 Nuclear Reactions Game	

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Standard #: Standard	Level	Concept	Performance Objective	Investigation Level A	Investigation Level B	Investigation Level C
2SC-P5.PO1 History and Nature of Science	Proficiency	Explain how theory, law and fact are developed in science to answer a specific question	Define theory, law and fact	<p><b><i>Car and Ramp</i></b> A-2 Investigations and Experiments</p> <p><b><i>Rollercoaster</i></b> A-1 Speed on the Roller Coaster</p>	<p><b><i>Car and Ramp</i></b> B-2 Investigating Speed</p> <p><b><i>Marble Launcher</i></b> B-3 Relating Launch Speed and Range</p> <p><b><i>Rollercoaster</i></b> B-3 Mass and Motion</p>	<p><b><i>Car and Ramp</i></b> C-3 The Physics of the Inclined Plane</p> <p><b><i>Marble Launcher</i></b> C-1 Projectile Motion and the Range Equation C-2 Improving the Range Equation</p>
2SC-P5.PO2 History and Nature of Science	Proficiency	Explain how theory, law and fact are developed in science to answer a specific question	Describe the relationships among theories, laws and fact	<p><b><i>Car and Ramp</i></b> A-4 Describing Motion A-5 Gravity</p> <p><b><i>Light and Optics</i></b> A-1 Introduction to Light</p> <p><b><i>Marble Launcher</i></b> A-1 Launch Angle and Distance A-2 Launch Speed and Distance</p> <p><b><i>Rollercoaster</i></b> A-2 Height on the Roller Coaster</p> <p><b><i>Ropes and Pulleys</i></b> A-1 Ropes and Pulleys A-2 What is Work?</p>	<p><b><i>Car and Ramp</i></b> B-3 Using a Scientific Model to Predict Speed B-4 Position and Time B-5 Acceleration</p> <p><b><i>Electric Circuits</i></b> B-3 Ohm's Law</p> <p><b><i>Light and Optics</i></b> B-2 Polarization</p> <p><b><i>Marble Launcher</i></b> B-3 Relating Launch Speed and Range</p> <p><b><i>Rollercoaster</i></b> B-2 Conservation of Energy B-3 Mass and Motion</p> <p><b><i>Ropes and Pulleys</i></b> B-1 Forces in Machines B-2 Work and Energy</p> <p><b><i>Sound and Waves</i></b> B-1 Sound</p>	<p><b><i>Car and Ramp</i></b> C-3 The Physics of the Inclined Plane</p> <p><b><i>Light and Optics</i></b> C-1 Light and Color</p> <p><b><i>Marble Launcher</i></b> C-1 Projectile Motion and the Range Equation C-2 Improving the Range Equation</p> <p><b><i>Rollercoaster</i></b> C-1 Motion on the Roller Coaster C-3 Mass, Motion, and Energy</p> <p><b><i>Ropes and Pulleys</i></b> C-1 Simple and Complex Pulley Systems</p>

## Correlation to Arizona Science Standards Curriculum Resource Guide

Standard #: Standard	Level	Concept	Performance Objective	Investigation Level A	Investigation Level B	Investigation Level C
2SC-P5.PO3 History and Nature of Science	Proficiency	Explain how theory, law and fact are developed in science to answer a specific question	Explain how theories, laws and facts are used to answer specific questions		<b>Marble Launcher</b> B-3 Relating Launch Speed and Range  <b>Rollercoaster</b> B-2 Conservation of Energy B-3 Mass and Motion	<b>Car and Ramp</b> C-3 The Physics of the Inclined Plane  <b>Light and Optics</b> C-1 Light and Color  <b>Marble Launcher</b> C-1 Projectile Motion and the Range Equation C-2 Improving the Range Equation
2SC-P6.PO1 History and Nature of Science	Proficiency	Analyze evidence that supports past and current scientific theories about a specific topic	Distinguish between evidence which supports a given scientific theory (e.g., model of the atom, plate tectonics, natural selection) and evidence which does not support the theory	<b>Car and Ramp</b> A-4 Describing Motion A-5 Gravity  <b>Light and Optics</b> A-1 Introduction to Light  <b>Marble Launcher</b> A-1 Launch Angle and Distance A-2 Launch Speed and Distance  <b>Rollercoaster</b> A-2 Height on the Roller Coaster  <b>Ropes and Pulleys</b> A-1 Ropes and Pulleys A-2 What is Work?	<b>Car and Ramp</b> B-3 Using a Scientific Model to Predict Speed B-4 Position and Time B-5 Acceleration  <b>Electric Circuits</b> B-3 Ohm's Law  <b>Light and Optics</b> B-2 Polarization  <b>Rollercoaster</b> B-3 Mass and Motion  <b>Ropes and Pulleys</b> B-1 Forces in Machines B-2 Work and Energy  <b>Sound and Waves</b> B-1 Sound	<b>Light and Optics</b> C-1 Light and Color  <b>Marble Launcher</b> C-2 Improving the Range Equation  <b>Rollercoaster</b> C-1 Motion on the Roller Coaster C-3 Mass, Motion, and Energy  <b>Ropes and Pulleys</b> C-1 Simple and Complex Pulley Systems
3SC-P1.PO1 Personal and Social Perspectives in Science and Technology	Proficiency	Apply scientific thought processes and procedures to personal and social issues	Apply scientific thought processes of skepticism, empiricism, objectivity and logic seek a solution to personal and social issues		<b>Light and Optics</b> B-2 Polarization	

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Standard #: Standard	Level	Concept	Performance Objective	Investigation Level A	Investigation Level B	Investigation Level C
3SC-P2.PO1 Personal and Social Perspectives in Science and Technology	Proficiency	Propose and test, using computer software or common materials, a solution to an existing problem; or design a product to meet a need, using a model or simulation	Describe a problem or need	<b><i>Electric Motor</i></b> A-4 Designing Motors <b><i>Gears and Levers</i></b> A-4 Designing Gear Machines	<b><i>Electric Motor</i></b> B-3 The Electric Motor <b><i>Gears and Levers</i></b> B-3 Compound Gear Machines <b><i>Ropes and Pulleys</i></b> B-3 Efficiency	<b><i>Electric Motor</i></b> C-1 Introduction to the Electric Motor
3SC-P2.PO2 Personal and Social Perspectives in Science and Technology	Proficiency	Propose and test, using computer software or common materials, a solution to an existing problem; or design a product to meet a need, using a model or simulation	Propose a solution to the problem or design a product to meet the need	<b><i>Electric Motor</i></b> A-4 Designing Motors <b><i>Gears and Levers</i></b> A-4 Designing Gear Machines	<b><i>Electric Motor</i></b> B-3 The Electric Motor <b><i>Gears and Levers</i></b> B-3 Compound Gear Machines <b><i>Ropes and Pulleys</i></b> B-3 Efficiency	<b><i>Electric Motor</i></b> C-1 Introduction to the Electric Motor
3SC-P2.PO3 Personal and Social Perspectives in Science and Technology	Proficiency	Propose and test, using computer software or common materials, a solution to an existing problem; or design a product to meet a need, using a model or simulation	Design a method of testing the solution or design a model or simulation to test the product	<b><i>Electric Motor</i></b> A-4 Designing Motors <b><i>Gears and Levers</i></b> A-4 Designing Gear Machines	<b><i>Electric Motor</i></b> B-3 The Electric Motor <b><i>Gears and Levers</i></b> B-3 Compound Gear Machines <b><i>Ropes and Pulleys</i></b> B-3 Efficiency	<b><i>Electric Motor</i></b> C-1 Introduction to the Electric Motor

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Standard #: Standard	Level	Concept	Performance Objective	Investigation Level A	Investigation Level B	Investigation Level C
3SC-P2.PO4 Personal and Social Perspectives in Science and Technology	Proficiency	Propose and test, using computer software or common materials, a solution to an existing problem; or design a product to meet a need, using a model or simulation	Carry out the test of the solution or product	<i>Electric Motor</i> A-4 Designing Motors <i>Gears and Levers</i> A-4 Designing Gear Machines	<i>Electric Motor</i> B-3 The Electric Motor <i>Gears and Levers</i> B-3 Compound Gear Machines <i>Ropes and Pulleys</i> B-3 Efficiency	<i>Electric Motor</i> C-1 Introduction to the Electric Motor
3SC-P2.PO5 Personal and Social Perspectives in Science and Technology	Proficiency	Propose and test, using computer software or common materials, a solution to an existing problem; or design a product to meet a need, using a model or simulation	Evaluate the test results	<i>Electric Motor</i> A-4 Designing Motors <i>Gears and Levers</i> A-4 Designing Gear Machines	<i>Electric Motor</i> B-3 The Electric Motor <i>Gears and Levers</i> B-3 Compound Gear Machines <i>Ropes and Pulleys</i> B-3 Efficiency	<i>Electric Motor</i> C-1 Introduction to the Electric Motor
3SC-P3.PO1 Personal and Social Perspectives in Science and Technology	Proficiency	Compare and contrast the goals of science and technology	Define the goals of science and the goals of technology		<i>Light and Optics</i> B-2 Polarization B-3 Optical Technology	
3SC-P3.PO2 Personal and Social Perspectives in Science and Technology	Proficiency	Compare and contrast the goals of science and technology	Compare the goals of science and the goals of technology		<i>Light and Optics</i> B-2 Polarization B-3 Optical Technology	

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Standard #: Standard	Level	Concept	Performance Objective	Investigation Level A	Investigation Level B	Investigation Level C
3SC-P3.PO3 Personal and Social Perspectives in Science and Technology	Proficiency	Compare and contrast the goals of science and technology	Describe the impact of technology on the life, physical, earth and space sciences		<i>Atom Building Game</i> B-2 Nuclear Reactions Game	
3SC-P4.PO1 Personal and Social Perspectives in Science and Technology	Proficiency	Identify and describe the basic processes of the natural ecosystems and how these processes affect, and are affected by, humans	Describe the basic processes of the natural ecosystems (e.g., water cycle, nutrient cycles)			<i>Periodic Table Tiles</i> C-3 Classifying Reactions
5SC-P2.PO1 Physical Science	Proficiency	Describe and explain properties and composition of samples of matter, using models (including atomic and molecular structure and the periodic table)	Use models of atomic and molecular structure to explain properties of matter	<i>Atom Building Game</i> A-1 Building Atoms A-2 Atomic Challenge A-3 Building Molecules <i>Light and Optics</i> A-1 Introduction to Light <i>Periodic Table Tiles</i> A-1 The Periodic Table A-2 Groups of Elements	<i>Atom Building Game</i> B-1 Comparing Atoms B-2 Nuclear Reactions Game B-3 Bonding and Molecules <i>Periodic Table Tiles</i> B-1 Chemical Formulas B-2 A Tour of the Periodic Table	<i>Atom Building Game</i> C-1 Electrons and the Periodic Table C-2 Photons and Lasers C-3 Valence Electrons and Molecules <i>Light and Optics</i> C-1 Light and Color <i>Periodic Table Tiles</i> C-1 Electrons and the Periodic Table
5SC-P2.PO2 Physical Science	Proficiency	Describe and explain properties and composition of samples of matter, using models (including atomic and molecular structure and the periodic table)	Use the periodic table to predict properties of elements and compounds	<i>Periodic Table Tiles</i> A-3 Chemical Reactions	<i>Periodic Table Tiles</i> B-3 Chemical Equations	<i>Periodic Table Tiles</i> C-1 Electrons and the Periodic Table

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Standard #: Standard	Level	Concept	Performance Objective	Investigation Level A	Investigation Level B	Investigation Level C
5SC-P2.PO3 Physical Science	Proficiency	Describe and explain properties and composition of samples of matter, using models (including atomic and molecular structure and the periodic table)	Predict the properties of substances based upon ionic, covalent, or hydrogen bonding	<i>Atom Building Game</i> A-3 Building Molecules <i>Periodic Table Tiles</i> A-2 Groups of Elements	<i>Atom Building Game</i> B-3 Bonding and Molecules <i>Periodic Table Tiles</i> B-1 Chemical Formulas	<i>Atom Building Game</i> C-1 Electrons and the Periodic Table C-3 Valence Electrons and Molecules <i>Periodic Table Tiles</i> C-1 Electrons and the Periodic Table
5SC-P3.PO2 Physical Science	Proficiency	Identify, measure, calculate, and analyze qualitative and quantitative relationships associated with energy forms and energy transfer or transformation (e.g., changes in temperature, velocity, potential energy, kinetic energy, conduction, convection, ect)	Measure quantitative (e.g., heat, mechanical, electrical) relationships associated with energy		<i>Air Rocket</i> B-3 Pressure and Speed <i>Rollercoaster</i> B-1 Energy and the Rollercoaster B-2 Conservation of Energy <i>Ropes and Pulleys</i> B-2 Work and Energy	<i>Air Rocket</i> C-4 Energy and Power <i>Pendulum</i> C-1 Energy Conservation and the Pendulum <i>Rollercoaster</i> C-1 Motion on the Roller Coaster <i>Ropes and Pulleys</i> C-2 Compound Pulley System

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Standard #: Standard	Level	Concept	Performance Objective	Investigation Level A	Investigation Level B	Investigation Level C
5SC-P3.PO3 Physical Science	Proficiency	Identify, measure, calculate, and analyze qualitative and quantitative relationships associated with energy forms and energy transfer or transformation (e.g., changes in temperature, velocity, potential energy, kinetic energy, conduction, convection, ect)	Calculate quantitative relationships associated with energy (e.g., heat mechanical, electrical)			<i>Air Rocket</i> C-4 Energy and Power
5SC-P4.PO1 Physical Science	Proficiency	Observe, measure and calculate quantities to demonstrate conservation of matter and energy in chemical changes (e.g., acid base, precipitation, heat)	Use the law of conservation of matter to explain the quantitative relationships between reactants and products in chemical reactions	<i>Periodic Table Tiles</i> A-3 Chemical Reactions	<i>Periodic Table Tiles</i> B-3 Chemical Equations	<i>Periodic Table Tiles</i> C-2 Challenging Chemical Equations C-3 Classifying Reactions

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Standard #: Standard	Level	Concept	Performance Objective	Investigation Level A	Investigation Level B	Investigation Level C
5SC-P5.PO1 Physical Science	Proficiency	Describe and predict chemical reactions (including combustion and simple chemical reactions) and physical interaction of matter (including velocity, force, work and power), using words or symbolic equations	Express a chemical reaction by using a balanced equation	<i>Periodic Table Tiles</i> A-3 Chemical Reactions	<i>Periodic Table Tiles</i> B-3 Chemical Equations	<i>Periodic Table Tiles</i> C-2 Challenging Chemical Equations C-3 Classifying Reactions
5SC-P5.PO2 Physical Science	Proficiency	Describe and predict chemical reactions (including combustion and simple chemical reactions) and physical interaction of matter (including velocity, force, work and power), using words or symbolic equations	Predict the products of a chemical reaction using types of reactions (e.g., synthesis, decomposition, replacement, combustion)			<i>Periodic Table Tiles</i> C-3 Classifying Reactions

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Standard #: Standard	Level	Concept	Performance Objective	Investigation Level A	Investigation Level B	Investigation Level C
5SC-P5.PO3 Physical Science	Proficiency	Describe and predict chemical reactions (including combustion and simple chemical reactions) and physical interaction of matter (including velocity, force, work and power), using words or symbolic equations	Describe physical interactions through use of word equations or formulae	<p><b><i>Car and Ramp</i></b> A-3 Speed A-4 Describing Motion A-5 Gravity</p> <p><b><i>Gravity Drop</i></b> A-2 Speed and the Gravity Drop A-3 Falling Motion</p> <p><b><i>Rollercoaster</i></b> A-1 Speed on the Roller Coaster A-2 Height on the Roller Coaster</p> <p><b><i>Ropes and Pulleys</i></b> A-2 What is Work?</p>	<p><b><i>Air Rocket</i></b> B-1 The Air Rocket B-2 Motion of the Air Rocket B-3 Pressure and Speed B-4 The Rocket and Newton's Laws of Motion B-5 The Acceleration of a Rocket</p> <p><b><i>Car and Ramp</i></b> B-2 Investigating Speed B-3 Using a Scientific Model to Predict Speed B-4 Position and Time B-5 Acceleration B-6 Force, Mass, and Acceleration</p> <p><b><i>Gravity Drop</i></b> B-1 Introduction to the Gravity Drop B-2 Speed, Acceleration, and Free Fall B-3 Newton's Second Law</p> <p><b><i>Marble Launcher</i></b> B-2 Launch Speed and Range</p> <p><b><i>Rollercoaster</i></b> B-1 Energy and the Rollercoaster B-2 Conservation of Energy B-3 Mass and Motion</p> <p><b><i>Ropes and Pulleys</i></b> B-2 Work and Energy B-3 Efficiency</p>	<p><b><i>Air Rocket</i></b> C-3 Acceleration and G-forces C-4 Energy and Power C-5 Conservation of Momentum</p> <p><b><i>Car and Ramp</i></b> C-1 Uniform Accelerated Motion C-2 Newton's Second Law and Friction C-3 The Physics of the Inclined Plane</p> <p><b><i>Electric Motor</i></b> C-2 Optimizing Performance</p> <p><b><i>Gravity Drop</i></b> C-1 Speed, Acceleration, and Free Fall C-2 Measuring Gravity C-3 Interpreting Graphs of Accelerated Motion</p> <p><b><i>Marble Launcher</i></b> C-1 Projectile Motion and the Range Equation C-2 Improving the Range Equation C-3 Accuracy, Precision, and Error</p> <p><b><i>Pendulum</i></b> C-2 Newton's Second Law and the Pendulum</p> <p><b><i>Rollercoaster</i></b> C-1 Motion on the Roller Coaster C-2 Rotational Kinetic Energy C-3 Mass, Motion, and Energy</p> <p><b><i>Ropes and Pulleys</i></b> C-1 Simple and Complex Pulley Systems</p>

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Standard #: Standard	Level	Concept	Performance Objective	Investigation Level A	Investigation Level B	Investigation Level C
						C-2 Compound Pulley System <b><i>Sound and Waves</i></b> C-2 The Speed of a Wave Pulse

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Standard #: Standard	Level	Concept	Performance Objective	Investigation Level A	Investigation Level B	Investigation Level C
5SC-P5.PO4 Physical Science	Proficiency	Describe and predict chemical reactions (including combustion and simple chemical reactions) and physical interaction of matter (including velocity, force, work and power), using words or symbolic equations	Predict the results of a physical interaction by using an algebraic formula	<p><b>Electric Circuits</b> A-3 Current and Voltage</p> <p><b>Gears and Levers</b> A-1 The Lever A-2 Gears</p> <p><b>Light and Optics</b> A-3 Rules of Reflection</p> <p><b>Marble Launcher</b> A-1 Launch Angle and Distance A-2 Launch Speed and Distance</p> <p><b>Ropes and Pulleys</b> A-1 Ropes and Pulleys A-2 What is Work?</p>	<p><b>Car and Ramp</b> B-3 Using a Scientific Model to Predict Speed</p> <p><b>Electric Circuits</b> B-1 Voltage B-2 Current</p> <p><b>Gears and Levers</b> B-1 Levers, Torque and Mechanical Advantage B-2 Gears and Rotating Motion B-4 Machines with Gears and Levers</p> <p><b>Gravity Drop</b> B-2 Speed, Acceleration, and Free Fall</p> <p><b>Marble Launcher</b> B-1 Launch Angle and Range B-2 Launch Speed and Range B-3 Relating Launch Speed and Range</p> <p><b>Pendulum</b> B-2 The Five Second Pendulum</p> <p><b>Rollercoaster</b> B-2 Conservation of Energy</p> <p><b>Ropes and Pulleys</b> B-1 Forces in Machines B-2 Work and Energy</p>	<p><b>Car and Ramp</b> C-1 Uniform Accelerated Motion C-3 The Physics of the Inclined Plane</p> <p><b>Electric Circuits</b> C-3 Compound Circuits</p> <p><b>Gears and Levers</b> C-2 The Center of Gravity and Equilibrium</p> <p><b>Gravity Drop</b> C-1 Speed, Acceleration, and Free Fall C-3 Interpreting Graphs of Accelerated Motion</p> <p><b>Light and Optics</b> C-1 Light and Color C-5 Geometric Optics C-6 The Thin Lens Equation</p> <p><b>Marble Launcher</b> C-1 Projectile Motion and the Range Equation C-2 Improving the Range Equation</p> <p><b>Pendulum</b> C-3 The Physical Pendulum</p> <p><b>Rollercoaster</b> C-1 Motion on the Roller Coaster C-2 Rotational Kinetic Energy</p> <p><b>Ropes and Pulleys</b> C-1 Simple and Complex Pulley Systems</p> <p><b>Sound and Waves</b> C-1 Standing Waves</p>

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Standard #: Standard	Level	Concept	Performance Objective	Investigation Level A	Investigation Level B	Investigation Level C
5SC-P6.PO1 Physical Science	Proficiency	Describe and explain physical interactions of matter and energy, using conceptual models (e.g., particle model for gaseous behavior)	Demonstrate the use of conceptual models in science (e.g., formulae, diagrams, graphs)	<p><b>Car and Ramp</b> A-4 Describing Motion</p> <p><b>Gears and Levers</b> A-4 Designing Gear Machines</p> <p><b>Gravity Drop</b> A-3 Falling Motion</p> <p><b>Light and Optics</b> A-2 Color</p> <p><b>Marble Launcher</b> A-1 Launch Angle and Distance A-2 Launch Speed and Distance</p> <p><b>Pendulum</b> A-1 The Pendulum</p> <p><b>Rollercoaster</b> A-2 Height on the Roller Coaster</p> <p><b>Ropes and Pulleys</b> A-1 Ropes and Pulleys A-2 What is Work?</p> <p><b>Sound and Waves</b> A-1 Sound</p>	<p><b>Air Rocket</b> B-2 Motion of the Air Rocket B-3 Pressure and Speed B-4 The Rocket and Newton's Laws of Motion</p> <p><b>Car and Ramp</b> B-3 Using a Scientific Model to Predict Speed B-4 Position and Time B-5 Acceleration B-6 Force, Mass, and Acceleration B-7 Weight, Gravity, and Friction</p> <p><b>Electric Circuits</b> B-3 Ohm's Law</p> <p><b>Gravity Drop</b> B-2 Speed, Acceleration, and Free Fall B-3 Newton's Second Law</p> <p><b>Light and Optics</b> B-4 Ratios</p> <p><b>Marble Launcher</b> B-1 Launch Angle and Range B-2 Launch Speed and Range B-3 Relating Launch Speed and Range</p> <p><b>Pendulum</b> B-1 Harmonic Motion B-2 The Five Second Pendulum</p> <p><b>Rollercoaster</b> B-1 Energy and the Rollercoaster B-2 Conservation of Energy B-3 Mass and Motion</p>	<p><b>Air Rocket</b> C-3 Acceleration and G-forces</p> <p><b>Car and Ramp</b> C-1 Uniform Accelerated Motion C-2 Newton's Second Law and Friction C-3 The Physics of the Inclined Plane</p> <p><b>Electric Circuits</b> C-1 Series Circuits</p> <p><b>Electric Motor</b> C-2 Optimizing Performance</p> <p><b>Gravity Drop</b> C-1 Speed, Acceleration, and Free Fall C-2 Measuring Gravity C-3 Interpreting Graphs of Accelerated Motion</p> <p><b>Light and Optics</b> C-5 Geometric Optics C-6 The Thin Lens Equation</p> <p><b>Marble Launcher</b> C-1 Projectile Motion and the Range Equation C-2 Improving the Range Equation</p> <p><b>Pendulum</b> C-1 Energy Conservation and the Pendulum C-2 Newton's Second Law and the Pendulum C-3 The Physical Pendulum</p> <p><b>Rollercoaster</b> C-1 Motion on the Roller Coaster C-2 Rotational Kinetic Energy</p>

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Standard #: Standard	Level	Concept	Performance Objective	Investigation Level A	Investigation Level B	Investigation Level C
					<p><b>Ropes and Pulleys</b> B-1 Forces in Machines B-2 Work and Energy</p> <p><b>Sound and Waves</b> B-1 Sound</p>	<p>C-3 Mass, Motion, and Energy</p> <p><b>Ropes and Pulleys</b> C-1 Simple and Complex Pulley Systems</p> <p><b>Sound and Waves</b> C-1 Standing Waves C-3 Natural Frequency and Resonance C-4 Sound</p>
5SC-P6.PO2 Physical Science	Proficiency	Describe and explain physical interactions of matter and energy, using conceptual models (e.g., particle model for gaseous behavior)	Describe physical interactions of matter and energy (e.g., phase change, gas laws, momentum conservation)	<p><b>Rollercoaster</b> A-2 Height on the Roller Coaster</p>	<p><b>Air Rocket</b> B-3 Pressure and Speed</p> <p><b>Rollercoaster</b> B-1 Energy and the Rollercoaster B-2 Conservation of Energy</p> <p><b>Ropes and Pulleys</b> B-2 Work and Energy</p>	<p><b>Air Rocket</b> C-4 Energy and Power C-5 Conservation of Momentum</p> <p><b>Pendulum</b> C-1 Energy Conservation and the Pendulum</p> <p><b>Rollercoaster</b> C-1 Motion on the Roller Coaster</p> <p><b>Ropes and Pulleys</b> C-2 Compound Pulley System</p>

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5SC-P6.PO3 Physical Science	Proficiency	Describe and explain physical interactions of matter and energy, using conceptual models (e.g., particle model for gaseous behavior)	Justify the validity of known conceptual models applied to physical phenomena	<b>Ropes and Pulleys</b> A-1 Ropes and Pulleys	<b>Air Rocket</b> B-1 The Air Rocket B-2 Motion of the Air Rocket B-3 Pressure and Speed B-4 The Rocket and Newton's Laws of Motion B-5 The Acceleration of a Rocket  <b>Car and Ramp</b> B-5 Acceleration B-6 Force, Mass, and Acceleration B-8 Equilibrium, Action, and Reaction  <b>Gravity Drop</b> B-1 Introduction to the Gravity Drop B-3 Newton's Second Law  <b>Ropes and Pulleys</b> B-1 Forces in Machines B-2 Work and Energy B-3 Efficiency	<b>Air Rocket</b> C-3 Acceleration and G-forces C-5 Conservation of Momentum  <b>Car and Ramp</b> C-1 Uniform Accelerated Motion C-2 Newton's Second Law and Friction C-3 The Physics of the Inclined Plane  <b>Gravity Drop</b> C-2 Measuring Gravity  <b>Pendulum</b> C-2 Newton's Second Law and the Pendulum  <b>Ropes and Pulleys</b> C-1 Simple and Complex Pulley Systems C-2 Compound Pulley System
5SC-P7.PO1 Physical Science	Proficiency	Demonstrate the understanding of gravitation as a universal force that each mass exerts on any other mass	Use the universal law of gravitation to predict how the gravity force changes with a change of distance and/or mass		<b>Gravity Drop</b> B-1 Introduction to the Gravity Drop	

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Curriculum Resource Guide**

Standard #: Standard	Level	Concept	Performance Objective	Investigation Level A	Investigation Level B	Investigation Level C
5SC-P8.PO1 Physical Science	Proficiency	Demonstrate qualitative understanding of the 1st Law of Thermodynamics (conservation of matter and energy) and the 2nd Law of Thermodynamics (entropy)	Use the 1st Law of Thermodynamics to explain the energy changes in a physical system		<b><i>Air Rocket</i></b> B-3 Pressure and Speed <b><i>Rollercoaster</i></b> B-1 Energy and the Rollercoaster B-2 Conservation of Energy <b><i>Ropes and Pulleys</i></b> B-2 Work and Energy	<b><i>Air Rocket</i></b> C-4 Energy and Power <b><i>Pendulum</i></b> C-1 Energy Conservation and the Pendulum <b><i>Rollercoaster</i></b> C-1 Motion on the Roller Coaster <b><i>Ropes and Pulleys</i></b> C-2 Compound Pulley System
5SC-P8.PO2 Physical Science	Proficiency	Demonstrate qualitative understanding of the 1st Law of Thermodynamics (conservation of matter and energy) and the 2nd Law of Thermodynamics (entropy)	Describe a sequence of events that illustrates the 2nd Law of Thermodynamics		<b><i>Ropes and Pulleys</i></b> B-3 Efficiency	