

Correlation to Sunshine State Science Content Assessed by FCAT grade 10 Curriculum Resource Guide

Standard #: Strand	Standard	Grade tested	Benchmark	Investigation Level A	Investigation Level B	Investigation Level C
SC.A.1.4.1 The Nature of Matter	The student understands that all matter has observable, measurable properties.	10	The student knows that the electron configuration in atoms determines how a substance reacts and how much energy is involved in its reactions.	<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-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	<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
SC.A.1.4.2 The Nature of Matter	The student understands that all matter has observable, measurable properties.	10	The student knows that the vast diversity of the properties of materials is primarily due to variations in the forces that hold molecules together.	<i>Atom Building Game</i> A-2 Atomic Challenge	<i>Atom Building Game</i> B-1 Comparing Atoms B-2 Nuclear Reactions Game	
SC.A.1.4.4 The Nature of Matter	The student understands that all matter has observable, measurable properties.	10	The student experiments and determines that the rates of reaction among atoms and molecules depend on the concentration, pressure, and temperature of the reactants and the presence or absence of catalysts.			<i>Periodic Table Tiles</i> C-3 Classifying Reactions

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SC.A.1.4.5 The Nature of Matter	The student understands that all matter has observable, measurable properties.	10	The student knows that connections (bonds) form between substances when outer-shell electrons are either transferred or shared between their atoms, changing the properties of substances.	<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-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	<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
SC.A.2.4.1 The Nature of Matter	The student understands the basic principles of atomic theory.	10	The student knows that the number and configuration of electrons will equal the number of protons in an electrically neutral atom and when an atom gains or losses electrons, the charge is unbalanced.	<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
SC.A.2.4.3 The Nature of Matter	The student understands the basic principles of atomic theory.	10	The student knows that a number of elements have heavier, unstable nuclei that decay, spontaneously giving off smaller particles and waves that result in a small loss of mass and release a large amount of energy.		<i>Atom Building Game</i> B-2 Nuclear Reactions Game	

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SC.A.2.4.4 The Nature of Matter	The student understands the basic principles of atomic theory.	10	The student knows that nuclear energy is released when small, light atoms are fused into heavier ones.		<i>Atom Building Game</i> B-2 Nuclear Reactions Game	
SC.A.2.4.5 The Nature of Matter	The student understands the basic principles of atomic theory.	10	The student knows that elements are arranged into groups and families based on similarities in electron structure and that their physical and chemical properties can be predicted.	<i>Periodic Table Tiles</i> A-1 The Periodic Table A-3 Chemical Reactions	<i>Periodic Table Tiles</i> B-2 A Tour of the Periodic Table B-3 Chemical Equations	<i>Periodic Table Tiles</i> C-1 Electrons and the Periodic Table
SC.A.2.4.6 The Nature of Matter	The student understands the basic principles of atomic theory.	10	The student understands that matter may act as a wave, a particle, or something else entirely different with its own characteristic behavior.	<i>Periodic Table Tiles</i> A-3 Chemical Reactions	<i>Periodic Table Tiles</i> B-3 Chemical Equations <i>Sound and Waves</i> B-3 Standing Waves on a String	<i>Periodic Table Tiles</i> C-1 Electrons and the Periodic Table C-3 Classifying Reactions <i>Sound and Waves</i> C-1 Standing Waves

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SC.B.1.4.1 Energy	The students recognizes that energy may be changed in form with varying efficiency.	10	The student understands how knowledge of energy is fundamental to all the scientific disciplines (e.g., the energy required for biological processes in living organisms and the energy required for the building, erosion, and rebuilding of the Earth).	<i>Rollercoaster</i> A-2 Height on the Roller Coaster	<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
SC.B.1.4.2 Energy	The students recognizes that energy may be changed in form with varying efficiency.	10	The student understands that there is conservation of mass and energy when matter is transformed.	<i>Rollercoaster</i> A-2 Height on the Roller Coaster	<i>Air Rocket</i> B-3 Pressure and Speed <i>Periodic Table Tiles</i> B-3 Chemical Equations <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
SC.B.1.4.4 Energy	The students recognizes that energy may be changed in form with varying efficiency.	10	The student knows that as electrical charges oscillate, they create time-varying electric and magnetic fields that propagate away from the source as an electromagnetic wave.	<i>Electric Motor</i> A-1 Magnets A-2 Magnetic Materials A-3 How a Motor Works A-4 Designing Motors A-5 Measuring Current and Voltage	<i>Electric Motor</i> B-1 Permanent Magnets B-2 Electromagnets B-3 The Electric Motor B-4 Current, Voltage, and Power B-5 Generators	<i>Electric Motor</i> C-1 Introduction to the Electric Motor C-2 Optimizing Performance C-3 Generators and Faraday's Law of Induction

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SC.B.1.4.6 Energy	The students recognizes that energy may be changed in form with varying efficiency.	10	The student knows that the first law of thermodynamics relates the transfer of energy to the work done and the heat transferred.		<i>Pendulum</i> B-1 Harmonic Motion <i>Ropes and Pulleys</i> B-3 Efficiency	<i>Air Rocket</i> C-4 Energy and Power
SC.B.1.4.7 Energy	The students recognizes that energy may be changed in form with varying efficiency.	10	The student knows that the total amount of usable energy always decreases, even though the total amount of energy is conserved in any transfer.	<i>Rollercoaster</i> A-2 Height on the Roller Coaster	<i>Air Rocket</i> B-3 Pressure and Speed <i>Pendulum</i> B-1 Harmonic Motion <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
SC.B.2.4.1 Energy	The student understands the interaction of matter and energy.	10	The student knows that the structure of the universe is the result of interactions involving fundamental particles (matter) and basic forces (energy) and that evidence suggests that the universe contains all of the matter and energy that ever existed.		<i>Ropes and Pulleys</i> B-2 Work and Energy	

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SC.C.1.4.2 Force and Motion	The student understands that types of motion may be described, measured, and predicted.	10	The student knows that any change in velocity is an acceleration.		<i>Air Rocket</i> B-5 The Acceleration of a Rocket <i>Car and Ramp</i> B-5 Acceleration <i>Gravity Drop</i> B-1 Introduction to the Gravity Drop B-3 Newton's Second Law	<i>Air Rocket</i> C-3 Acceleration and G-forces C-5 Conservation of Momentum <i>Car and Ramp</i> C-1 Uniform Accelerated Motion <i>Gravity Drop</i> C-2 Measuring Gravity <i>Pendulum</i> C-2 Newton's Second Law and the Pendulum
SC.C.2.4.1 Force and Motion	The student understands that the types of force that act on an object and the effect of that force can be described, measured, and predicted.	10	The student knows that acceleration due to gravitational force is proportional to mass and inversely proportional to the square of the distance between the objects.		<i>Gravity Drop</i> B-1 Introduction to the Gravity Drop	
SC.C.2.4.2 Force and Motion	The student understands that the types of force that act on an object and the effect of that force can be described, measured, and predicted.	10	The student knows that electrical forces exist between any two charged objects.	<i>Atom Building Game</i> A-2 Atomic Challenge	<i>Atom Building Game</i> B-1 Comparing Atoms B-2 Nuclear Reactions Game	

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SC.C.2.4.3 Force and Motion	The student understands that the types of force that act on an object and the effect of that force can be described, measured, and predicted.	10	The student describes how magnetic force and electrical force are two aspects of a single force.	<i>Electric Motor</i> A-3 How a Motor Works A-4 Designing Motors A-5 Measuring Current and Voltage	<i>Electric Motor</i> B-2 Electromagnets B-3 The Electric Motor B-4 Current, Voltage, and Power	<i>Electric Motor</i> C-1 Introduction to the Electric Motor C-2 Optimizing Performance
SC.C.2.4.4 Force and Motion	The student understands that the types of force that act on an object and the effect of that force can be described, measured, and predicted.	10	The student knows that the forces that hold the nucleus of an atom together are much stronger than electromagnetic force and that this is the reason for the great amount of energy released from the nuclear reactions in the sun and other stars.	<i>Atom Building Game</i> A-2 Atomic Challenge	<i>Atom Building Game</i> B-1 Comparing Atoms B-2 Nuclear Reactions Game	
SC.C.2.4.5 Force and Motion	The student understands that the types of force that act on an object and the effect of that force can be described, measured, and predicted.	10	The student knows that most observable forces can be traced to electric forces acting between atoms or molecules.	<i>Atom Building Game</i> A-2 Atomic Challenge	<i>Atom Building Game</i> B-1 Comparing Atoms B-2 Nuclear Reactions Game	

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SC.C.2.4.6 Force and Motion	The student understands that the types of force that act on an object and the effect of that force can be described, measured, and predicted.	10	The student explains that all forces come in pairs commonly called action and reaction.		<p><i>Air Rocket</i> 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</p> <p><i>Car and Ramp</i> B-8 Equilibrium, Action, and Reaction</p>	<p><i>Air Rocket</i> C-5 Conservation of Momentum</p> <p><i>Car and Ramp</i> C-2 Newton's Second Law and Friction</p>
SC.H.1.4.2 The Nature of Science	The student uses the scientific processes and habits of mind to solve problems.	10	The student knows that from time to time, major shifts occur in the scientific view of how the world works, but that more often the changes that take place in the body of scientific knowledge are small modifications of prior knowledge.	<p><i>Car and Ramp</i> A-2 Investigations and Experiments</p> <p><i>Rollercoaster</i> A-2 Height on the Roller Coaster</p>	<p><i>Air Rocket</i> B-4 The Rocket and Newton's Laws of Motion</p> <p><i>Car and Ramp</i> B-2 Investigating Speed</p> <p><i>Marble Launcher</i> B-3 Relating Launch Speed and Range</p> <p><i>Rollercoaster</i> B-2 Conservation of Energy B-3 Mass and Motion</p>	<p><i>Car and Ramp</i> C-3 The Physics of the Inclined Plane</p> <p><i>Light and Optics</i> C-1 Light and Color</p> <p><i>Marble Launcher</i> C-1 Projectile Motion and the Range Equation C-2 Improving the Range Equation</p>

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SC.H.1.4.3 The Nature of Science	The student uses the scientific processes and habits of mind to solve problems.	10	The student understands that no matter how well one theory fits observations, a new theory might fit them as well or better, or might fit a wider range of observations, because in science, the testing, revising, and occasional discarding ect.	<p><i>Car and Ramp</i> A-2 Investigations and Experiments A-4 Describing Motion A-5 Gravity</p> <p><i>Light and Optics</i> A-1 Introduction to Light</p> <p><i>Marble Launcher</i> A-1 Launch Angle and Distance A-2 Launch Speed and Distance</p> <p><i>Rollercoaster</i> A-2 Height on the Roller Coaster</p> <p><i>Ropes and Pulleys</i> A-1 Ropes and Pulleys A-2 What is Work?</p>	<p><i>Car and Ramp</i> B-2 Investigating Speed B-3 Using a Scientific Model to Predict Speed B-4 Position and Time B-5 Acceleration</p> <p><i>Electric Circuits</i> B-3 Ohm's Law</p> <p><i>Gravity Drop</i> B-2 Speed, Acceleration, and Free Fall B-3 Newton's Second Law</p> <p><i>Light and Optics</i> B-2 Polarization</p> <p><i>Marble Launcher</i> B-1 Launch Angle and Range</p> <p><i>Rollercoaster</i> B-3 Mass and Motion</p> <p><i>Ropes and Pulleys</i> B-1 Forces in Machines B-2 Work and Energy</p> <p><i>Sound and Waves</i> B-1 Sound</p>	<p><i>Gravity Drop</i> C-1 Speed, Acceleration, and Free Fall C-2 Measuring Gravity</p> <p><i>Light and Optics</i> C-1 Light and Color C-5 Geometric Optics C-6 The Thin Lens Equation</p> <p><i>Marble Launcher</i> C-2 Improving the Range Equation</p> <p><i>Rollercoaster</i> C-1 Motion on the Roller Coaster C-3 Mass, Motion, and Energy</p> <p><i>Ropes and Pulleys</i> C-1 Simple and Complex Pulley Systems</p>

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SC.H.1.4.4 The Nature of Science	The student uses the scientific processes and habits of mind to solve problems.	10	The student knows that scientists in any one research group tend to see things alike and that therefore scientific teams are expected to seek out the possible sources of bias in the design of their investigations and in their data analysis.		<p><i>Air Rocket</i> B-4 The Rocket and Newton's Laws of Motion</p> <p><i>Light and Optics</i> B-2 Polarization</p> <p><i>Marble Launcher</i> B-3 Relating Launch Speed and Range</p> <p><i>Pendulum</i> B-2 The Five Second Pendulum</p>	<p><i>Gravity Drop</i> C-3 Interpreting Graphs of Accelerated Motion</p> <p><i>Marble Launcher</i> C-1 Projectile Motion and the Range Equation</p>
SC.H.1.4.6 The Nature of Science	The student uses the scientific processes and habits of mind to solve problems.	10	The student understands that, in the short run, new ideas that do not mesh well with mainstream ideas in science often encounter vigorous criticism and that, in the long run, theories are judged by how they fit with other theories.		<p><i>Marble Launcher</i> B-3 Relating Launch Speed and Range</p> <p><i>Rollercoaster</i> B-3 Mass and Motion</p>	<p><i>Car and Ramp</i> C-3 The Physics of the Inclined Plane</p> <p><i>Light and Optics</i> C-1 Light and Color</p> <p><i>Marble Launcher</i> C-1 Projectile Motion and the Range Equation C-2 Improving the Range Equation</p>

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SC.H.1.4.7 The Nature of Science	The student uses the scientific processes and habits of mind to solve problems.	10	The student understands the importance of a sense of responsibility, a commitment to peer review, truthful reporting of the methods and outcomes of investigations, and making the public aware of the findings.		<p><i>Air Rocket</i> B-2 Motion of the Air Rocket B-3 Pressure and Speed B-4 The Rocket and Newton's Laws of Motion</p> <p><i>Electric Circuits</i> B-2 Current</p>	
SC.H.2.4.2 The Nature of Science	The student understands that most natural events occur in comprehensible, consistent patterns.	10	The student knows that scientists control conditions in order to obtain evidence, but when that is not possible for practical or ethical reasons, they try to observe a wide range of natural occurrences to discern patterns.	<p><i>Car and Ramp</i> A-2 Investigations and Experiments</p> <p><i>Light and Optics</i> A-2 Color</p> <p><i>Pendulum</i> A-1 The Pendulum</p> <p><i>Rollercoaster</i> A-1 Speed on the Roller Coaster</p>	<p><i>Air Rocket</i> B-3 Pressure and Speed B-4 The Rocket and Newton's Laws of Motion</p> <p><i>Car and Ramp</i> B-2 Investigating Speed</p> <p><i>Pendulum</i> B-1 Harmonic Motion</p>	<p><i>Air Rocket</i> C-3 Acceleration and G-forces</p> <p><i>Pendulum</i> C-1 Energy Conservation and the Pendulum</p>

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SC.H.3.4.1 The Nature of Science	The student understands that science, technology, and society are interwoven and interdependent.	10	The student knows that performance testing is often conducted using small-scale models, computer simulations, or analogous systems to reduce the chance of system failure.	<p><i>Car and Ramp</i> A-4 Describing Motion</p> <p><i>Electric Motor</i> A-4 Designing Motors</p> <p><i>Gears and Levers</i> A-4 Designing Gear Machines</p> <p><i>Gravity Drop</i> A-3 Falling Motion</p> <p><i>Marble Launcher</i> A-1 Launch Angle and Distance A-2 Launch Speed and Distance</p> <p><i>Pendulum</i> A-1 The Pendulum</p> <p><i>Rollercoaster</i> A-2 Height on the Roller Coaster</p> <p><i>Sound and Waves</i> A-1 Sound</p>	<p><i>Air Rocket</i> B-2 Motion of the Air Rocket B-3 Pressure and Speed B-4 The Rocket and Newton's Laws of Motion</p> <p><i>Car and Ramp</i> 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><i>Electric Circuits</i> B-3 Ohm's Law</p> <p><i>Electric Motor</i> B-3 The Electric Motor</p> <p><i>Gears and Levers</i> B-3 Compound Gear Machines</p> <p><i>Gravity Drop</i> B-2 Speed, Acceleration, and Free Fall B-3 Newton's Second Law</p> <p><i>Light and Optics</i> B-2 Polarization B-4 Ratios</p> <p><i>Marble Launcher</i> B-1 Launch Angle and Range B-2 Launch Speed and Range B-3 Relating Launch Speed and Range</p> <p><i>Pendulum</i> B-1 Harmonic Motion B-2 The Five Second Pendulum</p>	<p><i>Air Rocket</i> C-3 Acceleration and G-forces</p> <p><i>Car and Ramp</i> C-1 Uniform Accelerated Motion C-2 Newton's Second Law and Friction C-3 The Physics of the Inclined Plane</p> <p><i>Electric Circuits</i> C-1 Series Circuits</p> <p><i>Electric Motor</i> C-1 Introduction to the Electric Motor C-2 Optimizing Performance</p> <p><i>Gravity Drop</i> C-1 Speed, Acceleration, and Free Fall C-2 Measuring Gravity C-3 Interpreting Graphs of Accelerated Motion</p> <p><i>Light and Optics</i> C-5 Geometric Optics C-6 The Thin Lens Equation</p> <p><i>Marble Launcher</i> C-1 Projectile Motion and the Range Equation C-2 Improving the Range Equation</p> <p><i>Pendulum</i> C-1 Energy Conservation and the Pendulum C-2 Newton's Second Law and the Pendulum C-3 The Physical Pendulum</p> <p><i>Rollercoaster</i></p>

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					<i>Rollercoaster</i> B-1 Energy and the Rollercoaster B-2 Conservation of Energy B-3 Mass and Motion <i>Ropes and Pulleys</i> B-3 Efficiency <i>Sound and Waves</i> B-1 Sound	C-1 Motion on the Roller Coaster C-2 Rotational Kinetic Energy C-3 Mass, Motion, and Energy <i>Sound and Waves</i> C-1 Standing Waves C-3 Natural Frequency and Resonance C-4 Sound
SC.H.3.4.2 The Nature of Science	The student understands that science, technology, and society are interwoven and interdependent.	10	The student knows that technological problems often create a demand for new scientific knowledge and that new technologies make it possible for scientists to extend their research in a way that advances science.		<i>Light and Optics</i> B-2 Polarization B-3 Optical Technology	
SC.H.3.4.5 The Nature of Science	The student understands that science, technology, and society are interwoven and interdependent.	10	The student knows that the value of a technology may differ for different people and at different times.		<i>Light and Optics</i> B-2 Polarization B-3 Optical Technology	

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SC.H.3.4.6 The Nature of Science	The student understands that science, technology, and society are interwoven and interdependent.	10	The student knows that scientific knowledge is used by those who engage in design and technology to solve practical problems, taking human values and limitations into account.	<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