

GIPS Physics Design Map

Units (in sequence)	Estimated Time Frame (days)	K-12 Program Strands With Corresponding Course/Grade Level Standards	K-12 Program Enduring Understandings (for content only)	K-12 Program Essential Questions (for content only)	Assessments (note if optional)	C/GL Key Vocabulary Concepts
Chapter 1 A Physics Toolkit (Measurement and Graphing)	7 Days	<u>Integrated Science</u> Use appropriate technology as a tool in problem solving	Scientists analyze data to determine what evidence is valid and how that informs what they do/think. Descriptions of change are necessary to reasonably predict what will happen. Scientific inquiry progresses through a continuous process of questioning, data collection, analysis, and interpretation. [There is no fixed set of steps that scientists follow, no one path that lead to scientific knowledge.] See strand one for full text.	What information do I have? What information do I need? How do I get that information? How do I collect and record data to remember what is important? How do I use data to support my thinking? What affect does changing one variable have on the result?	Structured Response and Application	Newton's Laws of Motion inertia weight mass net force equilibrium vector resultant friction projectile/circular motion relative velocity gravitational force conservation of momentum system
Chapter 2 Representing Motion	13 Days	<u>Physical Science:</u> 2.2 Motions and Forces Describe and apply the laws of motion	An object's motion can be predicted and is the result of the combined effect of all forces acting on the object. See strand one for full text.	In what ways can objects move and what makes objects move the way they do?	Structured Response and Application	
Chapter 3 Accelerated Motion	15 Days	<u>Physical Science:</u> 2.2 Motions and Forces Describe and apply the laws of motion	An object's motion can be predicted and is the result of the combined effect of all forces acting on the object. See strand one for full text.	In what ways can objects move and what makes objects move the way they do?	Structured Response and Application	
Chapter 4 Forces in One Dimension	15 Days	<u>Physical Science:</u> 2.2 Motions and Forces Describe, examine, and analyze the characteristics of motion	The interaction between energy and matter creates forces (pushes and pulls) that produce predicable patterns of change. See strand one for full text.	In what ways can objects move and what makes objects move the way they do?	Structured Response and Application	
Chapter 5 Forces in Two Dimensions	15 Days	<u>Physical Science</u> 2.2 Motions and Forces Describe, examine, and analyze the characteristics of motion	The interaction between energy and matter creates forces (pushes and pulls) that produce predicable patterns of change. See strand one for full text.	In what ways can objects move and what makes objects move the way they do?	Structured Response and Application	

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Chapter 6 Motion in Two Dimensions	15 Days	Physical Science: 2.2 Motions and Forces Describe, examine, and analyze the characteristics of motion	The interaction between energy and matter creates forces (pushes and pulls) that produce predictable patterns of change. See strand one for full text.	In what ways can objects move and what makes objects move the way they do?	Structured Response and Application	work machine mechanical advantage work-energy theorem conservation of energy kinetic energy potential energy electrostatics Coulomb's Law
Chapter 7 Gravitation	15 Days	Physical Science: 2.2 Motions and Forces Demonstrate and analyze the relationships among forces and motion Earth and Space Science: 4.3 Origin and Evolution Describe and explain the history and scale of the universe and solar system	An object's motion is the result of the combined effect of all forces acting on the object. Evidence gathered from the past is used to explain origination of an event, phenomenon, species, system and help predict the future. See strand one for full text.	How are forces produced? What role do forces play here? How do scientists work to figure how the world continues to change over time?	Structured Response, Application, and writing research assignment	
Chapter 9 Momentum and Its Conservation	15 days	Physical Science: 2.3 Matter and Energy Describe, examine, and apply the laws of conservation of momentum and energy	The total amount of momentum remains constant, even though it is transferred between objects. See strand one for full text.	How does energy, matter, and momentum remain constant in a closed system?	Structured Response and Application	
Chapter 10 Energy, Work, and Simple Machines	15 Days	Physical Science: 2.3 Matter and Energy Demonstrate and analyze the relationships among forces and motion. Describe, examine, and apply the laws of conservation of momentum and energy	Machines do not reduce the amount of work that is done, they only change the direction of the force, multiply the force or multiply the distance through which the force is applied. See strand one for full text.	How does energy cause change? What happens when a machine is used to do work? Does using this machine make my work easier? How is this machine designed to do work?	Structured Response and Application	

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Chapter 11 Energy and Its Conservation	15 Days	<p>Physical Science: 2.3 Matter and Energy</p> <p>Describe, examine, and apply the laws of conservation of momentum and energy.</p>	<p>The total amount of matter and energy remains constant, even though their form and location undergo continual change.</p> <p>Although the various forms of energy seem very different, each can be measured in a way that makes it possible to keep track of how much of one form is converted into another.</p> <p>See strand one for full text.</p>	<p>How does energy cause change?</p> <p>Where does energy come from? Where does it go?</p> <p>How does energy, matter, and momentum remain constant in a closed system?</p> <p>How does energy flow and how is it transmitted?</p>	Structured Response and Application	
Chapter 20 Static Electricity	15 Days	<p>Physical Science: 2.1 Chemical and Physical Properties of Matter</p> <p>Observe, describe, and measure the physical properties of matter at both the atomic and subatomic levels.</p> <p>Physical Science: 2.2 Motions and Forces</p> <p>Describe, examine, and analyze the characteristics of forces.</p>	<p>The characteristics of atomic or molecular structure determine the ways in which substances react.</p> <p>The interaction between energy and matter creates forces (pushes and pulls) that produce predictable patterns of change.</p> <p>See strand one for full text.</p>	<p>How do the properties of a substance determine its use?</p> <p>How does the structure of the atom affect the physical and chemical properties of the atom?</p> <p>How are forces produced? What role do forces play here?</p>	Structured Response and Application	