Core Ideas, Topics and Titles	Established Goals	Understanding of Concepts	Essential Questions	Students Outcomes
		GRADE THREE		
Core Idea: Mechanical Waves, PS4A **Topic: Water Waves** **Title: *Row, Row, Row Your Boat***	• Investigate patterns of motion that can be made in water by disturbing the surface.	• It takes energy to make waves. • When waves move across the water's surface the water goes up and down and a small object, floating on the water, goes up and down and forward and backward.	• What are waves? • How do waves travel when an object is dropped in water?	• Demonstrate how waves move around an object. • Demonstrate how waves can be made in water by disturbing the surface.
Core Idea: Mechanical Waves, PS4A, PS4.C **Topic: Coding with Sound** **Title: *Do You Hear What I Hear?* (Part One)**	• Sound travels in waves through air, in water and through solids. • Sound can make matter vibrate, and vibrating matter can make sound. • People use their senses to learn about the world about them.	• The vibration of different objects creates identifiable sounds. • Sound can convey information.	• How can you tell sounds apart? • What sounds are used to send, or convey information in the world around you?	• Compare sounds to develop sound discrimination. • Describe sounds using their identifiable properties.
Core Idea: Mechanical Waves, PS4.A **Topic: Designing a Code** **Title: *Dropping In* (Part Two)**	• The human ear and brain are very good at detecting and decoding patterns of information in sound and distinguishing them from random noise.	• Identifiable properties of sound can be used to make a code to send a message. • Sound can convey information. • A sound code can be used to develop a basic communication system.	• How can you tell sounds apart? • What other sounds are used to give information? • How can sounds be used to create a communication system?	• Indentify parts necessary to create a successful communications system using sound. • Observe sounds made by objects when dropped. • Compare sounds to develop sound discrimination. • Create a code to use in a communication system. • Communicate with others using a drop code.

Core Idea: Electromagnetic Radiation, PS4B **Topic: Light and Lenses** **Title: *Shine The Light* (Part 1)**	• Investigate the properties of light. (refraction and reflection)	• Light waves react with matter. • Path of light is blocked by an object. • Path of light bends at the surface of a prism.	• What is light? • How does light move? • What can light pass through? • What happens when light bends? • Why does light bend? • Can you predict/change the path of a wave of light? •	• Use a prism to direct light. • Change the path of light waves. • Determine whether the light waves are reflected or refracted.
Core Idea: Information Technologies and Instrumentation, PS4C **Topic: Light and Lenses** **Title: *Shine The Light* (Part 2)**	• Investigate the design and properties of concave and convex lenses as they relate to light.	• Different shape lenses create different images. • Multiple lenses can create multiple images.	• How a lenses is shaped? • How do concave and convex lenses make things look? • What happens to an image when you use multiple lenses at the same time? •	• Visually recognize the difference between concave and convex lenses. • Explain how convex lenses cause rays of light to converge and concave lenses cause rays to diverge.