Unit 3 - How Energy Powers Our World
Pacing Guide

*Informational writing standards are now being covered in science. Please use these resources to address the informational writing standards. These lessons can be incorporated at any point during the unit.

Unit & Lesson #	Focus	Standards Addressed	Day	Overview	Writing Activities	Additional Activities
Electricity, Light, & Heat Anchor Phenomenon	Energy & Modeling	4-PS3-2	1	The anchor phenomenon for this unit is a mysterious set of three glowing towers in the desert. Students generate observations and questions about the phenomenon and create an initial conceptual model to explain what is happening.	Mystery Tower See-Think-Wonder Chart	
Electricity, Light, & Heat Lesson 1 What's the best way to light up a city?	Renewable Energy & Natural Resources	4-ESS3-1	2	In this lesson, students explore how a city's electricity is derived from natural resources such as coal, sunlight, wind, and water. They investigate how using these different energy sources affects the environment.		

			3	In the activity, Power this Town, students obtain and combine information about different types of renewable energy, and evaluate the advantages and disadvantages of each energy source. Wrap-up slides & teacher-led discussion.	Wind, Sun, & Water Energy	
			4	Anchor Connection Students wonder: How does the electricity go from the towers to places where people use electricity? Students learn: There are many different ways that people generate electricity. The three towers in the desert are one example.	Science Journal entry to answer anchor connection question.	
			5	Lesson 1 Assessment Extensions		

				include: readings.		
Electricity, Light, & Heat Lesson 2 What if there were no electricity?	Energy Transfer & Engineering	4-PS3-2 4-PS3-4 3-5-ETS1-1 3-5-ETS1-3	6	In this lesson, students are introduced to electricity as a form of energy.		
			7	In the activity, Build a Flashlight, students investigate how electrical energy requires a circuit and make their own mini flashlights from LEDs, button batteries, and strips of aluminum foil. Along the way, they'll learn about the anatomy of a battery, begin to see how circuits work, and discover how handy an on-off switch can be. Wrap-up slides & teacher-led discussion.		
			8	Anchor Connection Students wonder: How do the towers even make electricity?	Science Journal entry to answer anchor connection question.	

				Students learn: Regardless of which way that humans generate electricity, they have to figure out a way to distribute that electricity out to the places where it is used.		
			9	Lesson 2 Assessment Extensions include: Readings, activities, and videos.		
Electricity, Light, & Heat Lesson 3 How long did it take to travel across the country before cars and planes?	Heat Energy & Energy Transfer	4-PS3-2 4-PS3-4	10	In this session, students explore how heat is another form of energy that can make things go.		
			11	In part 1 of the activity, Heat Spinner, students first make a paper Heat Spinner and observe how air can create movement. Then, students use their Heat Spinners to experiment with a heat source (an incandescent bulb) and discover how heat energy can make the		

				spinner move in different ways.		
			12	In part 2 of the activity, students use their Heat Spinners to experiment with a heat source (an incandescent bulb) and discover how heat energy can make the spinner move in different ways. Wrap-up slides & teacher-led discussion.		
			13	Anchor Connection Students wonder: How are the towers different from other ways of using solar energy? Students learn: The solar towers generate electricity in a sequence of steps.	Science Journal entry to answer anchor connection question.	
			14	Lesson 3 Assessment Extensions include: Reading,		

				activity, and discussion.		
Electricity, Light, & Heat Unit Assessment			15	Electricity, Light, & Heat Unit Assessment		
Electricity, Light, & Heat Performance Task Can we get energy from the Sun at night?		4-ESS3-1	16	In the performance task, students obtain and combine information about various types of renewable energy resources and discover surprising things that they have in common. Students obtain and combine details about different types of power generation via informational texts and images. Encourage your students to work together and support one another as they work through the resources. The performance task begins with a brief unit review and moves into a step-by-step walkthrough of the student	Energy Readings	

				worksheets. In addition to the information contained within the lessons in this unit, you can provide your students with books, websites, or other resources that they can use to gather information about renewable energy resources. While not necessary, it is a great opportunity for students to extend the depth and breadth of their knowledge.		
Sound, Waves, and Communication Anchor Phenomenon Seeing Sound	Sound Waves & Conceptual Modeling	4-PS4-1 4-PS4-3	17	The anchor phenomenon for this unit is a music video by composer Nigel Stanford, that showcases a series of devices that make sound waves visible. Students generate observations and questions about the phenomenon and create an initial conceptual model to explain	Seeing Sound See-Think-Wonder Chart	

				what is happening.		
Sound, Waves, and Communication Lesson 1 How could you send a secret code?	Pattern Transfer & Technology	4-PS4-3 3-5-ETS1-3	18	In this session, students explore how digital devices encode complex information so that it can be transferred over long distances.		
			19	In the hands-on activity, Secret Snacks, students generate their own codes in order to transfer information across the classroom. Then, they compare their codes and evaluate which worked best given the criteria and constraints. Teacher-led discussion.		
			20	Anchor Connection Students wonder: What is sound? Students learn: The speaker and metal plate both	Science Journal entry to answer anchor connection question.	

				vibrate and make sounds when they receive an electrical signal. The electrical signal carries the sound as a code.		
			21	Lesson 1 Assessment Extensions include: Readings & mini-lessons		
Sound, Waves, and Communication Lesson 2 How far can a whisper travel?	Sound, Vibration, & Engineering	4-PS4-1 3-5-ETS1-2	22	In this session, students learn about the connection between sounds and vibration.		
			23	In the hands-on activity, Paper Cup Telephone, students make telephones using cups and string. Students then modify the design of their telephones using different types of supplies to see if they can improve the sound quality. Wrap-up slides & teacher-led discussion.	Paper Cup Telephone	

			24	Anchor Connection Students wonder: How do sound vibrations travel if we can't see the medium it's traveling through? Students learn: The sound vibrates the metal plate and changes the pattern as the sound changes. The plate is vibrating the most where there is less powder and vibrating the least in places where the powder is collecting.	Science Journal entry to answer anchor connection question.	
			25	Lesson 2 Assessment Extensions include: Readings, activities, and videos.		
Sound, Waves, and Communication Lesson 3 What would happen if you screamed in outer	Sound & Vibrations	4-PS4-1	26	In this session, students explore the role that air plays in enabling a sound vibration to travel.		
			27	In the hands-on activity, Act Out a		

space?				Sound, students do two short activities that explore sound vibrations. Students experiment with sound to understand how it moves through the air and then consider what would happen in an environment like space where there is no air. Wrap-up slides & teacher-led discussion.		
			28	Anchor Connection Students wonder: Do high and low sounds vibrate the same way? Students learn: The sound vibrations travel through water from the edge of the dish towards the center; in the same way the vibrations travel through air.	Science Journal entry to answer anchor connection question.	
			29	Lesson 3		

				Assessment Extensions include: Readings, activities, and videos.		
Sound, Waves, and Communication Lesson 4 Why are some sounds high and some sounds low?	Sound Waves & Wavelength	4-PS4-1	30	In this session, students discover that sound is a wave.		
			31	In the hands-on activity, Making Waves, students draw the waves that different sounds make using a virtual oscilloscope, a machine that shows images of sound waves. Then they vibrate a rope to make waves that look like the ones made by the oscilloscope. Teacher-led discussion.		
			32	Anchor Connection Students learn: The pattern of flames on the Ruben's Tube changes when the pitch of the sound	Science Journal entry to answer anchor connection question.	

				changes. The pattern of flames shows the wavelength of the sounds made.		
			33	Lesson 4 Assessment Extensions include: Readings, activities, and videos.		
Sound, Waves, & Communication Unit Assessment			34	Sound, Waves, & Communication Unit Assessment		
Sound, Waves, & Communication Performance Task How can you make sound waves visible?	Sound Waves & Engineering	4-PS4-1	35	In the Performance Task, students will design and build a device that uses the vibrations of sound to make visible patterns.		
Unit 3 Benchmark			36	LPS Unit 4 Benchmark (Given via LinkIt!)		