

Unit 2—Energy

Essential Question: What are some of the ways energy can be changed from one form to another?

Major Understandings:

- 4.1a** Energy exists in various forms: heat, electric, sound, chemical, mechanical, light.
- 4.1b** Energy can be transferred from one place to another.
- 4.1c** Some materials transfer energy better than others (heat and electricity).
- 4.1d** Energy and matter interact: water is evaporated by the Sun’s heat; a bulb is lighted by means of electrical current; a musical instrument is played to produce sound; dark colors may absorb light, light colors may reflect light.
- 4.1f** Heat can be released in many ways, for example: by burning, rubbing (friction), or combining one substance with another.
- 4.1g** Interactions with forms of energy can be either helpful or harmful.
- 4.2a** Everyday events involve one form of energy being changed to another.
- animals convert food to heat and motion
 - the Sun’s energy warms the air and water
- 4.2b** Humans utilize interactions between matter and energy.
- chemical to electrical, light, and heat: battery and bulb
 - electrical to sound (e.g., doorbell buzzer)
 - mechanical to sound (e.g., musical instruments, clapping)
 - light to electrical (e.g., solar-powered calculator)

Grade 3

WEEK 1	Lessons 1 and 2 (90 min) Objective(s): <ul style="list-style-type: none"> To assess children’s prior knowledge of energy. To define energy. To gather temperature data over time. 		Alignment with NYS Core Curriculum: 4.1a-d; 4.2a, 4.2b
	Advanced Planning/ Notes to Teachers Science Background: What Is Combustion? Science Background: Energy	Investigation/Activity Unit E Chapter 12 Opener: Energy Pp. 404-405 Unit E 12.1 What Is Energy? Pp. 406-407	Homework/Extra Practice Reading Support and HW: p. 87 Investigate Further: Lab Manual 146 Transparency: IS 38
	Lesson 3 and 4 (90 min) Objective(s): <ul style="list-style-type: none"> To gather temperature data over time. To define energy. To explain the difference between kinetic and potential energy. 		Alignment with NYS Core Curriculum: 4.1a-d, 4.2b
	Advanced Planning/ Notes to Teachers	Investigation/Activity Unit E 12.1 What Is Energy? Pp. 408-411	Homework/Extra Practice Transparency: RS 38 InstaLab: Energy In Motion

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WEEK 2	Lesson 5 and 6 (90 min) Objective(s): <ul style="list-style-type: none"> To gather temperature data over time. To define energy. To explain the difference between kinetic and potential energy. To measure the amount of energy transferred from sunlight to an object. To identify the sources and types of energy people use for different purposes. To define temperature. 		Alignment with NYS Core Curriculum: 4.1a-d, 4.2b; 4.1a-c, 4.2a, b
	Advanced Planning/ Notes to Teachers Science Background: Conserving Energy Science Background: Using Energy	Investigation/Activity Unit E 12.1 What Is Energy? Pp. 412-413 Unit E 12.2 How Can Energy Be Used? Pp. 414-415	Homework/Extra Practice Reading Support and HW: pp. 88-89
	Lesson 7 and 8 (90 min) Objective(s): <ul style="list-style-type: none"> To measure the amount of energy transferred from sunlight to an object. To identify the sources and types of energy people use for different purposes. To define temperature. 		Alignment with NYS Core Curriculum: 4.1a-c; 4.2 a, b
	Advanced Planning/ Notes to Teachers	Investigation/Activity Unit E 12.2 How Can Energy Be Used? Pp. 416-417	Homework/Extra Practice InstaLab: A Model Thermometer Reading Skill Mini Lesson Transparency: RS 39

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WEEK 3	Lesson 9 and 10 (90 min) Objective(s): <ul style="list-style-type: none"> To measure the amount of energy transferred from sunlight to an object. To identify the sources and types of energy people use for different purposes. To define temperature. 		Alignment with NYS Core Curriculum: 4.1 a-c, 4.2a,b; 4.1g
	Advanced Planning/ Notes to Teachers Science Background: Fossil Fuels	Investigation/Activity Unit E 12.2 How Can Energy Be Used? Pp. 418-419 Unit E 12.3 Why Is Energy Important? Pp. 420-421	Homework/Extra Practice Reading Support and HW: Pp. 90-91 Investigate Further: Lab Manual p. 152 Transparency: IS 40
	Lesson 11 and 12 (90 min) Objective(s): <ul style="list-style-type: none"> To describe static electricity. To know that electricity must move through a complete circuit to operate a device. To distinguish insulators from conductors and give examples. 		Alignment with NYS Core Curriculum: 4.1g, 4.1a,b,c,d, 4.1f
	Advanced Planning/ Notes to Teachers Scientific Background: What is electricity? Scientific Background: The Van de Graaf Generator	Investigation/Activity Unit E 12.3 Why Is Energy Important? Pp. 422-425 Unit E 13.1 What Is Electricity? Pp. 432-435	Homework/Extra Practice Transparency: RS 40 InstaLab: Save Fossil Fuels Reading Support and HW: Pp. 92-93 Transparency: RS 40 Investigate Further: Manual, p. 55

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WEEK 4	Lesson 13 and 14 (90 min) Objective(s): <ul style="list-style-type: none"> To describe static electricity. To know that electricity must move through a complete circuit to operate a device. To distinguish insulators from conductors and give examples. 		Alignment with NYS Core Curriculum: 4.1a,b,c,d, 4.1f
	Advanced Planning/ Notes to Teachers	Investigation/Activity Unit E 13.1 What Is Electricity? Pp. 436-439	Homework/Extra Practice InstaLab: Make It Light Reading Support and HW: Pp. 95-96
	Lesson 15 and 16 (90 min) Objective(s): <ul style="list-style-type: none"> To learn about the different forms of energy. To demonstrate that when a warm object is in contact with a cool one, the warm object loses heat and the cool one gains heat. To define heat and temperature. To compare conductors and insulators. 		Alignment with NYS Core Curriculum: 4.1a,b,c,d, 4.1f, 4.2a, 4.2b
	Advanced Planning/ Notes to Teachers Science Background: Heat vs. Temperature	Investigation/Activity Unit E 14.1 What Is Heat? Pp. 458-461	Homework/Extra Practice Reading Support and HW: P. 101

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WEEK 5	Lesson 17 and 18 (90 min) Objective(s): <ul style="list-style-type: none"> To learn about the different forms of energy. To demonstrate that when a warm object is in contact with a cool one, the warm object loses heat and the cool one gains heat. To define heat and temperature. To compare conductors and insulators. 		Alignment with NYS Core Curriculum: 4.1a,b,c,d 4.1f 4.2a 4.2b	
	Advanced Planning/ Notes to Teachers	Investigation/Activity Unit E 14.1 What Is Heat? Pp. 462-465		Homework/Extra Practice Transparency: RS 44 InstaLab: Feeling the Heat
	Lesson 19 and 20 (90 min) Objective(s): To review key concepts covered in Unit 2		Alignment with NYS Core Curriculum:	
	Advanced Planning/ Notes to Teachers Science Background: Is air matter?	Investigation/Activity Review and Test Prep		Homework/Extra Practice

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WEEK 6	Lesson 21 and 22 (90 min) Objective(s): <ul style="list-style-type: none"> To investigate the path of light. To define reflection and refraction. To understand shadows. 		Alignment with NYS Core Curriculum: 4.1a, 4.2b	
	Advanced Planning/ Notes to Teachers Science Background: Light Energy	Investigation/Activity Unit E 14.2 What Is Light? Pp. 466-469		Homework/Extra Practice Lab Manual: p. 167 Transparency: IS 45 InstaLab: What do you see? Transparency: RS 45
	Lesson 23 and 24 (90 min) Objective(s): <ul style="list-style-type: none"> To investigate the path of light. To define reflection and refraction. To understand shadows. 		Alignment with NYS Core Curriculum: 4.1a,b	
	Advanced Planning/ Notes to Teachers Science Up Close	Investigation/Activity Unit E.14.2 What Is Light? Pp. 470-471		Homework/Extra Practice Reading Support and HW: Pp. 104 and 105

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WEEK 7	Lesson 25 and 26 (90 min) Objective(s): <ul style="list-style-type: none"> To investigate how white light can be split into colored light. To describe how objects absorb light in different amounts. To explain how colored lights combine to make other colors. 		Alignment with NYS Core Curriculum: 4.1a 4.1c 4.2b
	Advanced Planning/ Notes to Teachers Science Background: Dyes and Pigments	Investigation/Activity Unit E.14.3 How are light and color related? Pp. 472-473	Homework/Extra Practice Investigate Further Lab Manual, p. 170 Transparency: IS 46
	Lesson 27 and 28 (90 min) Objective(s): <ul style="list-style-type: none"> To investigate how white light can be split into colored light. To describe how objects absorb light in different amounts. To explain how colored lights combine to make other colors. 		Alignment with NYS Core Curriculum: 4.1a 4.1c 4.2b
	Advanced Planning/ Notes to Teachers	Investigation/Activity Unit E.14.3 How Are Light and Color Related? Pp. 474-479	Homework/Extra Practice Insta Lab: Cover Up Transparency: RS 46 Reading Support and HW: Pp. 106 and 107

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WEEK 8	Lesson 29 and 30 (90 min) Objective(s): <ul style="list-style-type: none"> To investigate how a maraca makes sound. To identify vibrations as the source of sound, and define loudness and pitch. To explain how hearing works. 		Alignment with NYS Core Curriculum: 4.1a 4.1b 4.1c
	Advanced Planning/ Notes to Teachers Science Background: Sound Energy	Investigation/Activity Unit F 14.4 What Is Sound? Pp. 480-481	Homework/Extra Practice Investigate Further: Lab Manual. p. 143 Transparency: IS 47
	Lesson 31 and 32 (90 min) Objective(s): <ul style="list-style-type: none"> To investigate how a maraca makes sound. To identify vibrations as the source of sound, and define loudness and pitch. To explain how hearing works. 		Alignment with NYS Core Curriculum: 4.1a 4.1b 4.1c
	Advanced Planning/ Notes to Teachers	Investigation/Activity Unit F 14.4 What Is Sound? Pp. 482-485	Homework/Extra Practice Reading Support and HW: Pp. 108-109 InstaLab: Big Ears

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WEEK 9	Lesson 33 and 34 (90 min) Objective(s): To review key concepts covered in Unit 2		Alignment with NYS Core Curriculum: 4.1a-d, 4.1f-g, 4.2a-b
	Advanced Planning/ Notes to Teachers	Investigation/Activity Review and Test Prep	Homework/Extra Practice
	Lesson 35 and 36 (90 min) Objective(s):		Alignment with NYS Core Curriculum:
	Advanced Planning/ Notes to Teachers	Investigation/Activity Assessment	Homework/Extra Practice