

<p>Content: Science: Weather Conditions</p>	<p>Grade: 4th</p>	<p>Timeline: 45 minutes 10/19/15-10/23/15</p>
<p>Science Standard(s):</p> <p>4.1.1 Observe that results of repeated scientific investigations are seldom exactly the same.</p> <p>4.1.2 Form and support a hypothesis after collecting information by gathering specimens or observing an experiment.</p> <p>4.1.3 Differentiate between evidence gathered through observations and inferences, and use the evidence to develop a line of reasoning.</p> <p>4.3.3 Describe motion in reference to space and time. Ex: Measure and graph motions of objects (ball, toy car) with reference to time.</p> <p>4.4.7 Describe , compare, and contrast objects in the universe. Ex: solar systems, galaxies, stars</p> <p>4.4.8 Describe the seasonal changes that occur as a result of the Earth’s orbit around the sun.</p> <p>CCSS ELA Standards:</p> <p>4.RI.4 Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject.</p> <p>4.RI.5 Describe the overall structure (chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in a text or part of a text.</p> <p>4.W.7 Conduct short research projects that build knowledge through investigation of different aspects of a topic.</p> <p>4.W.10 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.</p>		
<p>Lesson Overview:</p> <p>In this lesson, students will be able to recognize weather is predicted by observing the relationships among changes in Earth’s atmosphere. The never-ending processes of the water cycle connect the ocean to weather and precipitation. Ocean tides are the result of the cycles of the sun and moon. Observing the movement patterns of the moon and other objects in space was the beginning of astronomy.</p>	<p>Lesson Objective(s):</p> <p>In this lesson, students will be able to</p> <ul style="list-style-type: none"> • Review and analyze theories about processes that take place in Earth’s atmosphere as to their strength and weaknesses using scientific evidence and information. • Describe the composition of the Earth’s atmosphere. • Explain what is meant by air pressure. • Compare and contrast the layers of the atmosphere. • Identify the sun as a major source of energy for Earth and recognize that this star provides the energy needed generate wind and weather. • Explain what causes the greenhouse effect. • Compare and contrast air masses, and explain what happens when they pass over an area. • Construct a device to measure and observe changes in air pressure. • Explain how different weather conditions are measured. • Recognize symbols used on weather maps. 	

<p>Vocabulary: question, hypothesis, data, collect, analyze, conclusion, prediction, investigation, experiment, support, observation, inference, atmosphere, air pressure, troposphere, stratosphere, greenhouse effect, air mass, front, cirrus, cumulus, cumulonimbus, stratus, barometer, humidity, hygrometer</p>	<p>Focus Question(s):</p> <ul style="list-style-type: none"> • How are the objects in our universe the same and how are they different? • How does the relationship between Earth and the sun affect our seasons? • What constitutes a year on the various planets? Why are they different? • What predictable observable pattern occurs as a result of the interaction between the earth, sun, and moon?
---	--

<p>Description of Lesson (including instructional strategies): <i>Day 1: 10/19/15 Chapter 1: What Makes Up the Earth's Surface? p. D4-9</i> I can describe the composition of the Earth's atmosphere. I can explain what is meant by air pressure.</p> <p>Anticipatory Set: Teacher will explain to students that they will be learning about the earth's atmosphere. Have students scan the chapter. Guide them in identifying the lesson titles and major headings and use them to outline the chapter.</p> <p>Instruction and Strategies: Help students focus on the supporting facts and details for the main idea: The thin blanket of air that surrounds the earth is called the atmosphere. Earth's atmosphere is divided into four layers based on changes in temperature. The layers, starting with the one closest to Earth, are the troposphere, stratosphere, mesosphere, and thermosphere.</p> <ul style="list-style-type: none"> • Teacher will lead a whole class discussion; ask the class, what makes up the earth's surface? (The thin blanket of air that surrounds the earth is the atmosphere.) • Preview the vocabulary terms on p. D6 • Read as a class pages D4-D9. • Students will take notes as teacher discusses and lectures. • Teacher will ask comprehension questions throughout the lesson. • Students will copy and define the vocabulary terms on p. D6. • Have students copy and answer the review questions on p. D9. <p>Description of Lesson (including instructional strategies): <i>Day 2: 10/20/15 Chapter 2: How Do Air Masses Affect Weather? p. D12-D17</i> I can identify the sun as the major source of energy for Earth and recognize that this star provides the energy needed to generate wind and weather.</p> <p>Anticipatory Set: Teacher will explain to students that they will be learning about how air masses affect weather. Have students scan the chapter. Guide them in identifying the lesson titles and major headings and use them to outline the chapter.</p>
--

Instruction and Strategies:

Help students focus on the supporting facts and details for the main idea: The sun provides the energy to make weather. Air masses form over continents and oceans.

- Teacher will lead a whole class discussion; ask the class, what makes up the earth's surface? (The thin blanket of air that surrounds the earth is the atmosphere.)
- Preview the vocabulary terms on p. D12
- Read as a class pages D12-D17.
- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- Students will copy and define the vocabulary terms on p. D12.
- Have students copy and answer the review questions on p. D17.

Description of Lesson (including instructional strategies):

Day 3: 10/21/15 Chapter 3: How is Weather Predicted? p. D20-D23

I can explain that plants have adaptations to help them meet their basic needs.

Anticipatory Set:

Teacher will explain to students that they will be learning about how air masses affect weather. Have students scan the chapter. Guide them in identifying the lesson titles and major headings and use them to outline the chapter.

Instruction and Strategies:

Help students focus on the supporting facts and details for the main idea: The sun provides the energy to make weather. Air masses form over continents and oceans.

- Teacher will lead a whole class discussion; ask the class, how is weather predicted? (Meteorologists are scientists who study and measure weather conditions. These conditions include air pressure, air temperature, humidity, and wind speed and direction.)
- Preview the vocabulary terms on p. D20
- Read as a class pages D20-D23.
- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- Students will copy and define the vocabulary terms on p. D20.
- Have students copy and answer the review questions on p. D23.

Description of Lesson (including instructional strategies):

Day 4: 10/22/15 Science Technology: Red Sprites, Blue Jets, and E.L.V.E.S. p. D24-D25

I can evaluate the impact of research and technology on scientific thought, society, and the environment.

I can identify careers related to science.

Anticipatory Set:

Have students scan the chapter. Guide them in identifying the lesson title and then to outline the article.

Instruction and Strategies:

Help students focus on the supporting facts and details for the main idea: Sprites occur in the thermosphere, blue jets in the stratosphere. ELVES are spherical and their edges can extend up into the atmosphere.

- Read as a class pages D24-D25.
- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- Have students copy and answer the Think About It questions on p. D25.

Description of Lesson (including instructional strategies):

Day 5: 10/23/15 People in Science: Denise Stephenson-Hawk: Atmospheric Scientist p. D26

I can connect chapter concepts with the contributions of scientists.

Anticipatory Set:

Have students scan the chapter. Guide them in identifying the lesson title and then to outline the article.

Instruction and Strategies:

- Read as a class pages D26.
- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- Have students copy and answer the Think About It questions on p. D26.
- Rain Gauge: What is a way to measure rain and other precipitation? P. D27

Formative Assessment:

Students will complete the workbook pages from each lesson.

Closure:

Students will share with the rest of the class their understanding of weather conditions.

Independent Practice:

Students will work independently to complete the workbook assessment pages for each lesson.

Resources:

Harcourt Science- 4th Grade	water
Harcourt Science workbook	masking tape
Pencil	scissors
Paper	wire hanger
1-liter bottle, clear plastic	plastic jar

Accommodations:

Cooperative groups will consist of students of various levels so they can help each other. If needed, there can be a small group of students on which the teacher focuses his/her attention. Have ESL students learn new words by selecting words in the dictionary and using them in sentences.

<p>Content: Science: The Oceans</p>	<p>Grade: 4th</p>	<p>Timeline: 45 minutes 10/26/15-10/30/15</p>
<p>Science Standard(s):</p> <p>4.1.1 Observe that results of repeated scientific investigations are seldom exactly the same.</p> <p>4.1.2 Form and support a hypothesis after collecting information by gathering specimens or observing an experiment.</p> <p>4.1.3 Differentiate between evidence gathered through observations and inferences, and use the evidence to develop a line of reasoning.</p> <p>4.3.3 Describe motion in reference to space and time. Ex: Measure and graph motions of objects (ball, toy car) with reference to time.</p> <p>4.4.7 Describe , compare, and contrast objects in the universe. Ex: solar systems, galaxies, stars</p> <p>4.4.8 Describe the seasonal changes that occur as a result of the Earth’s orbit around the sun.</p> <p>CCSS ELA Standards:</p> <p>4.RI.4 Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject.</p> <p>4.RI.5 Describe the overall structure (chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in a text or part of a text.</p> <p>4.W.7 Conduct short research projects that build knowledge through investigation of different aspects of a topic.</p> <p>4.W.10 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.</p>		
<p>Lesson Over view:</p> <p>In this lesson, students will be able to recognize that nearly three-fourths of Earth is covered with a great body of salt water. It is always moving and full of life. Its currents bring warm temperatures to otherwise cold areas. Its depths hide great mountain ranges. And its nutrient-rich waters are home to all sorts of living things.</p>	<p>Lesson Objective(s):</p> <p>In this lesson, students will be able to</p> <ul style="list-style-type: none"> • Demonstrate how fresh water can be extracted from salt water. • Define and describe the processes involved in the water cycle. • Describe the composition of ocean water. • Demonstrate how some ocean currents form. • Compare and contrast waves, tides, and currents. • Explain, in detail, what causes tides to rise and fall. • Describe features of the ocean floor. • Explain how new ocean floor forms. • Evaluate the impact of research and technology on scientific thought, society, and the environment. • Identify careers related to science. 	
<p>Vocabulary:</p> <p>question, hypothesis, data, collect, analyze, conclusion, prediction, investigation, experiment, support, observation, inference, water cycle, evaporation, condensation,</p>	<p>Focus Question(s):</p> <ul style="list-style-type: none"> • How are the objects in our universe the same and how are they different? • How does the relationship between Earth and the sun affect our seasons? • What constitutes a year on the various planets? Why 	

precipitation, wave, storm surge, tide, surface current, deep ocean current, shore zone, continental shelf, abyssal plain, trench, mid-ocean ridge

are they different?

- What predictable observable pattern occurs as a result of the interaction between the earth, sun, and moon?

Description of Lesson (including instructional strategies):

Day 1: 10/26/15 Chapter 1: What Role Do Oceans Play in the Water Cycle? p. D34-37

I can define and describe the processes involved in the water cycle.

Anticipatory Set:

Teacher will explain to students that they will be learning about the water cycle. Have students scan the chapter. Guide them in identifying the lesson titles and major headings and use them to outline the chapter.

Instruction and Strategies:

Help students focus on the supporting facts and details for the main idea: The waters of the ocean provide fresh water for Earth through the water cycle.

- Teacher will lead a whole class discussion; ask the class, what is the water cycle? (The waters of the ocean provide fresh water for Earth through the water cycle.)
- Preview the vocabulary terms on p. D34
- Read as a class pages D34-D37.
- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- Students will copy the vocabulary terms, define, and draw a picture for each on p. D34.
- Have students copy and answer the review questions on p. D37.
- Art: Have students create a water cycle mobile.

Materials:

- blue, yellow, and white construction paper
- glue
- scissors
- cotton balls
- crayons
- string/yarn



The Water Cycle Song

(Tune: She'll be coming around the mountain)

Water travels in a cycle, yes it does.
 Water travels in a cycle, yes it does.

It goes up as evaporation,
 And forms clouds as condensation,
 Then comes down as precipitation,
 Yes it does!

Description of Lesson (including instructional strategies):

Day 2: 10/27/15 Chapter 2: *What are the Motions of the Oceans?* p. D40-D45

I can explain about the ocean waves and currents.

Anticipatory Set:

Teacher will explain to students that they will be learning about the ocean movements.

Have students scan the chapter. Guide them in identifying the lesson titles and major headings and use them to outline the chapter.

Instruction and Strategies:

Help students focus on the supporting facts and details for the main idea: Ocean waves form as wind blows over the water's surface.

- Teacher will lead a whole class discussion; ask the class, what are the motions of the oceans? (The thin blanket of air that surrounds the earth is the atmosphere.)
- Preview the vocabulary terms on p. D40

- Read as a class pages D40-D45.
- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- Students will copy and define the vocabulary terms on p. D40.
- Have students copy and answer the review questions on p. D45.

Description of Lesson (including instructional strategies):

Day 3: 10/28/15 Chapter 3: What is the Ocean Floor Like? p. D48-D53

I can describe the features of the ocean floor.

Anticipatory Set:

Teacher will explain to students that they will be learning about the ocean floor.

Have students scan the chapter. Guide them in identifying the lesson titles and major headings and use them to outline the chapter.

Instruction and Strategies:

Help students focus on the supporting facts and details for the main idea: Many of the features found on dry land also are found on the floors of Earth's oceans.

- Teacher will lead a whole class discussion; ask the class, what is the ocean floor? (Many of the features found on dry land are also found on the floors of Earth's oceans. Plate movement also causes the formation of new ocean floor.)
- Preview the vocabulary terms on p. D48
- Read as a class pages D48-D53.
- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- Students will copy and define the vocabulary terms on p. D48.
- Have students copy and answer the review questions on p. D53.

Description of Lesson (including instructional strategies):

Day 4: 10/29/15 Science Technology: Deep Flight II. p. D54-D55

I can evaluate the impact of research and technology on scientific thought, society, and the environment.

I can identify careers related to science.

Anticipatory Set:

Have students scan the chapter. Guide them in identifying the lesson title and then to outline the article.

Instruction and Strategies:

Help students focus on the supporting facts and details for the main idea: The deep ocean is a wilderness that could be a source of many valuable resources.

- Read as a class pages D54-D55.
- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- Have students copy and answer the Think About It questions on p. D55.

Description of Lesson (including instructional strategies):

Day 5: 10/30/15 People in Science: Rachel Carson: Marine Biologist p. D56

I can connect chapter concepts with the contributions of scientists.

Anticipatory Set:

Have students scan the chapter. Guide them in identifying the lesson title and then to outline the article.

Instruction and Strategies:

- Read as a class pages D56.
- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- Have students copy and answer the Think About It questions on p. D56.
- Measuring Density: What are the relative densities of different solutions? P. D57

Formative Assessment:

Students will complete the review questions from each lesson.

Closure:

Students will share with the rest of the class their understanding of the oceans.

Independent Practice:

Students will work independently to complete the review questions for each lesson.

Resources:

Harcourt Science- 4th Grade	water	unsharpened pencil w/eraser
masking tape	glue	tall narrow jar
Pencil	scissors	safety goggles
Blue, white, yellow construction paper	string/yarn	
Crayons	cotton balls	
Salt	spoon	

Accommodations:

Cooperative groups will consist of students of various levels so they can help each other. If needed, there can be a small group of students on which the teacher focuses his/her attention. Have ESL students learn new words by selecting words in the dictionary and using them in sentences.

<p>Content: Science: Planets and Other Objects in Space</p>	<p>Grade: 4th</p>	<p>Timeline: 45 minutes 11/04/15-11/06/15</p>
<p>Science Standard(s):</p> <p>4.1.1 Observe that results of repeated scientific investigations are seldom exactly the same. 4.1.2 Form and support a hypothesis after collecting information by gathering specimens or observing an experiment. 4.1.3 Differentiate between evidence gathered through observations and inferences, and use the evidence to develop a line of reasoning. 4.3.3 Describe motion in reference to space and time. Ex: Measure and graph motions of objects (ball, toy car) with reference to time. 4.4.7 Describe, compare, and contrast objects in the universe. Ex: solar systems, galaxies, stars 4.4.8 Describe the seasonal changes that occur as a result of the Earth’s orbit around the sun.</p> <p>CCSS ELA Standards:</p> <p>4.RI.4 Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject. 4.RI.5 Describe the overall structure (chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in a text or part of a text. 4.W.7 Conduct short research projects that build knowledge through investigation of different aspects of a topic. 4.W.10 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.</p>		
<p>Lesson Overview:</p> <p>In this lesson, students will be able to explain how Earth and the planets move by observing constellations and patterns of change in the night sky. Telescopes and space probes have extended these observations far out into space.</p>	<p>Lesson Objective(s):</p> <p>In this lesson, students will be able to</p> <ul style="list-style-type: none"> • Describe the motions of Earth and the moon. • Explain how these motions cause phases of the moon. • Relate a day and year to the motions of Earth. • Describe the causes of the seasons. • Demonstrate two motions of planets- rotation and revolution. • Describe some characteristics of the star that is at the center of our solar system. • Distinguish among planets, asteroids, and comets. • Construct scale models of the solar system. • Explain how the planets are divided into two groups- Inner planets and outer planets • Analyze and critique theories regarding the formation of planets’ moons and rings. 	
<p>Vocabulary:</p> <p>question, hypothesis, data, collect, analyze, conclusion, prediction, investigation, experiment, support, observation, inference, satellite, orbit, phases, revolution, axis,</p>	<p>Focus Question(s):</p> <ul style="list-style-type: none"> • How are the objects in our universe the same and how are they different? • How does the relationship between Earth and the sun affect our seasons? • What constitutes a year on the various planets? Why 	

rotation, solar system, star, planet, asteroid, comet, inner planets, outer planets, gas giants, telescope, space probe

are they different?

- What predictable observable pattern occurs as a result of the interaction between the earth, sun, and moon?

Description of Lesson (including instructional strategies):

Day 1: 11/04/15 Chapter 1: How Do Earth and Its Moon Move? p. D62-67

I can describe the motions of the Earth and the moon.

I can explain how the motions cause phases of the moon.

I can describe the causes of the seasons.

Anticipatory Set:

Teacher will explain to students that they will be learning about how the earth and its moon move.

Have students scan the chapter. Guide them in identifying the lesson titles and major headings and use them to outline the chapter.

Instruction and Strategies:

Help students focus on the supporting facts and details for the main idea: As the moon orbits the earth, Earth is spinning on an imaginary axis. As Earth rotates it also revolves around the sun.

- Teacher will lead a whole class discussion; ask the class, How do Earth and its Moon move? (As the moon orbits the earth, Earth is spinning on an imaginary axis. As Earth rotates it also revolves around the sun.)
- Preview the vocabulary terms on p. D62
- Read as a class pages D62-D67.
- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- Students will copy the vocabulary terms, define, and draw a picture for each on p. D64.
- Have students copy and answer the review questions on p. D67.

Description of Lesson (including instructional strategies):

Day 2: 11/05/15 Chapter 2: How Do Objects Move in the Solar System? p. D70-D73

I can explain the way objects move in our solar system.

Anticipatory Set:

Teacher will explain to students that they will be learning about how objects move in the solar system. Have students scan the chapter. Guide them in identifying the lesson titles and major heading

and use them to outline the chapter.

Instruction and Strategies:

Help students focus on the supporting facts and details for the main idea: Our planet is made up of the sun, nine planets, and their moons, asteroids, and comets. Each planet revolves in an elliptical orbit around the sun and rotates on its own axis.

- Teacher will lead a whole class discussion; ask the class, how do objects move in our solar system? (Our planet is made up of the sun, nine planets, and their moons, asteroids, and comets. Each planet revolves in an elliptical orbit around the sun and rotates on its own axis.)
- Preview the vocabulary terms on p. D70
- Read as a class pages D70-D73.

- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- Students will copy and define the vocabulary terms on p. D70.
- Have students copy and answer the review questions on p. D73.

Description of Lesson (including instructional strategies):

Day 3: 11/06/15 Chapter 3: What are the Planets Like? p. D76-D81

I can describe the planets in our solar system.

Anticipatory Set:

Teacher will explain to students that they will be learning about the planets.

Have students scan the chapter. Guide them in identifying the lesson titles and major headings and use them to outline the chapter.

Instruction and Strategies:

Help students focus on the supporting facts and details for the main idea: The inner planets- Mercury, Venus, Earth and Mars are small and rocky. The outer planets- Jupiter, Saturn, Uranus and Neptune are gas giants.

- Teacher will lead a whole class discussion; ask the class, what are the planets like? (The inner planets-Mercury, Venus, Earth and Mars are small and rocky. The outer planets- Jupiter, Saturn, Uranus and Neptune are gas giants..)
- Preview the vocabulary terms on p. D76
- Read as a class pages D76-D81.
- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- Students will copy and define the vocabulary terms on p. D76.
- Have students copy and answer the review questions on p. D81.
- Teacher will ask comprehension questions throughout the lesson.
- Have students copy and answer the Think About It questions on p. D55.
- **Art: Solar System Project**

Formative Assessment:

Students will complete the review questions from each lesson.

Closure:

Students will share with the rest of the class their understanding of the planets and other objects in space.

Independent Practice:

Students will work independently to complete the review questions for each lesson.

Resources:

Harcourt Science- 4th Grade	paper	construction paper
masking tape	glue	crayons/markers/paint
Pencil	scissors	poster board/box/hanger

SOLAR SYSTEM PROJECT

2ND QUARTER | 4TH Grade

Instructions

Create a model of our solar system that includes the 9 planets: **Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune and Pluto**. It also needs to include the sun and the asteroid belt. All The planets can be hung from a hanger, hung inside a box or mounted on a poster board. The ideas are endless. Be creative and have fun.

Materials

- Poster board, box or hanger (for mounting the planets)
- Crayons, marker or paint (for coloring the planets)
- Glue
- Paper (for labeling the names of the celestial bodies)
- Construction paper, paper or foam balls (for the planets)

Due Date:

Rubric/Evaluation

	REQUIREMENTS
50	The planets and sun are properly named and ordered
25	Project is creative and neat
25	Project was turned in on time
Total: 100	

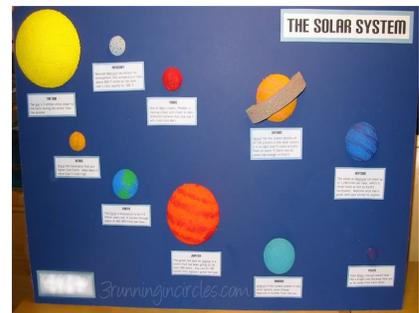
Project Samples



BOX



HANGER



POSTER BOARD

<p>Content: Science: Planets and Other Objects in Space Continuation</p>	<p>Grade: 4th</p>	<p>Timeline: 45 minutes 11/09/15-11/13/15</p>
<p>Science Standard(s):</p> <p>4.1.1 Observe that results of repeated scientific investigations are seldom exactly the same.</p> <p>4.1.2 Form and support a hypothesis after collecting information by gathering specimens or observing an experiment.</p> <p>4.1.3 Differentiate between evidence gathered through observations and inferences, and use the evidence to develop a line of reasoning.</p> <p>4.3.3 Describe motion in reference to space and time. Ex: Measure and graph motions of objects (ball, toy car) with reference to time.</p> <p>4.4.7 Describe , compare, and contrast objects in the universe. Ex: solar systems, galaxies, stars</p> <p>4.4.8 Describe the seasonal changes that occur as a result of the Earth’s orbit around the sun.</p> <p>CCSS ELA Standards:</p> <p>4.RI.4 Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject.</p> <p>4.RI.5 Describe the overall structure (chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in a text or part of a text.</p> <p>4.W.7 Conduct short research projects that build knowledge through investigation of different aspects of a topic.</p> <p>4.W.10 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.</p>		
<p>Lesson Overview:</p> <p>In this lesson, students will be able to explain how Earth and the planets move by observing constellations and patterns of change in the night sky. Telescopes and space probes have extended these observations far out into space.</p>	<p>Lesson Objective(s):</p> <p>In this lesson, students will be able to</p> <ul style="list-style-type: none"> • Describe the motions of Earth and the moon. • Explain how these motions cause phases of the moon. • Relate a day and year to the motions of Earth. • Describe the causes of the seasons. • Demonstrate two motions of planets- rotation and revolution. • Describe some characteristics of the star that is at the center of our solar system. • Distinguish among planets, asteroids, and comets. • Construct scale models of the solar system. • Explain how the planets are divided into two groups- Inner planets and outer planets • Analyze and critique theories regarding the formation of planets’ moons and rings. 	
<p>Vocabulary:</p> <p>question, hypothesis, data, collect, analyze, conclusion, prediction, investigation, experiment, support, observation, inference, satellite, orbit, phases, revolution, axis,</p>	<p>Focus Question(s):</p> <ul style="list-style-type: none"> • How are the objects in our universe the same and how are they different? • How does the relationship between Earth and the sun affect our seasons? • What constitutes a year on the various planets? Why 	

<p>rotation, solar system, star, planet, asteroid, comet, inner planets, outer planets, gas giants, telescope, space probe</p>	<p>are they different?</p> <ul style="list-style-type: none"> • What predictable observable pattern occurs as a result of the interaction between the earth, sun, and moon?
<p>Description of Lesson (including instructional strategies): Day 3: 11/09/15 Chapter 3: What are the Planets Like? p. D76-D81 (continuation) I can describe the planets in our solar system.</p> <p>Anticipatory Set: Teacher will explain to students that they will be learning about the planets. Have students scan the chapter. Guide them in identifying the lesson titles and major headings and use them to outline the chapter.</p> <p>Instruction and Strategies: Help students focus on the supporting facts and details for the main idea: The inner planets- Mercury, Venus, Earth and Mars are small and rocky. The outer planets- Jupiter, Saturn, Uranus and Neptune are gas giants.</p> <ul style="list-style-type: none"> • Teacher will lead a whole class discussion; ask the class, what are the planets like? (The inner planets-Mercury, Venus, Earth and Mars are small and rocky. The outer planets- Jupiter, Saturn, Uranus and Neptune are gas giants.) • Teacher will review the students on the different planets. • Students will review their notes as teacher discusses and lectures. • Teacher will ask comprehension questions throughout the lesson. • Music Link: Twinkle, Twinkle, Little Planet? Have each group pick one planet and write a song that describes the facts currently known about the planet. Suggest students use the “Twinkle, Twinkle, Little Star” for their songs. Ask volunteers to sing their songs to the class. • Planet Riddles Worksheet <p>Description of Lesson (including instructional strategies): Day 2: 11/10/15 Chapter 4: How Do People study the Solar System? p. D84-D89 I can construct and use a simple telescope.</p> <p>Anticipatory Set: Teacher will explain to students that they will be learning about how people study the solar system. Have students scan the chapter. Guide them in identifying the lesson titles and major headings and use them to outline the chapter.</p> <p>Instruction and Strategies: Help students focus on the supporting facts and details for the main idea: A telescope is a device people use to observe distant objects. Crewed missions and space probes are other ways to study objects in space.</p> <ul style="list-style-type: none"> • Teacher will lead a whole class discussion; ask the class, how do people study the solar system? (A telescope is a device people use to observe distant objects. Crewed missions and space probes are other ways to study objects in space.) • Preview the vocabulary terms on p. D84 • Read as a class pages D84-D89. 	

- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- Students will copy and define the vocabulary terms on p. D84.
- Have students copy and answer the review questions on p. D89.

Description of Lesson (including instructional strategies):

Day 3: 11/12/15 Chapter 4: How Do People study the Solar System? p. D84-D89 (continuation)

I can construct and use a simple telescope.

Anticipatory Set:

Teacher will explain to students that they will be learning about how people study the solar system. Have students scan the chapter. Guide them in identifying the lesson titles and major headings and use them to outline the chapter.

Instruction and Strategies:

Help students focus on the supporting facts and details for the main idea: A telescope is a device people use to observe distant objects. Crewed missions and space probes are other ways to study objects in space.

- Teacher will lead a whole class discussion; ask the class, how do people study the solar system? (A telescope is a device people use to observe distant objects. Crewed missions and space probes are other ways to study objects in space.)
- Review the vocabulary terms on p. D84
- Review pages D84-D89.
- Teacher will ask comprehension questions throughout the lesson.
- **Telescopes:** Have students construct a simple telescope and use it to observe some objects in space.

Materials: toilet paper rolls, tape, crayons/markers



Description of Lesson (including instructional strategies):

Day 4: 11/13/15 Science through Time: Discovering the Planets p.D90-D91

I can connect the chapter concepts with the history of science.

Anticipatory Set:

Have students scan the chapter. Guide them in identifying the lesson titles and major headings and use them to outline the chapter.

Instruction and Strategies:

Help students focus on the supporting facts and details for the main idea: What observation tools

helped people study their chosen planet.

- Read as a class pages D90-D91.
- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- Have students copy and answer the Think About It questions on p. D91.

People in Science: Clyde Tombaugh: Astronomer, Inventor p. D92

I can connect chapter concepts with the contributions of scientists.

Anticipatory Set:

Have students scan the chapter. Guide them in identifying the lesson title and then to outline the article.

Instruction and Strategies:

- Read as a class pages D92.
- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- Have students copy and answer the Think About It questions on p. D92.
- Sundial: How can you make an instrument that uses the sun to tell time? P. D93

Formative Assessment:

Students will complete the review questions from each lesson.

Closure:

Students will share with the rest of the class their understanding of the planets and other objects in space.

Independent Practice:

Students will work independently to complete the review questions for each lesson.

Resources:

Harcourt Science- 4th Grade	paper	
masking tape	glue	crayons/markers/paint
Pencil	scissors	toilet paper/paper towel rolls

Content: Science: Mass and Physical Change	Grade: 4 th	Timeline: 45 minutes 11/16/15-11/20/15
<p>Science Standard(s):</p> <p>4.1.1 Observe that results of repeated scientific investigations are seldom exactly the same.</p> <p>4.1.2 Form and support a hypothesis after collecting information by gathering specimens or observing an experiment.</p> <p>4.1.3 Differentiate between evidence gathered through observations and inferences, and use the evidence to develop a line of reasoning.</p> <p>4.3.3 Describe motion in reference to space and time. Ex: Measure and graph motions of objects (ball, toy car) with reference to time.</p> <p>4.4.7 Describe , compare, and contrast objects in the universe. Ex: solar systems, galaxies, stars</p> <p>4.4.8 Describe the seasonal changes that occur as a result of the Earth’s orbit around the sun.</p> <p>CCSS ELA Standards:</p> <p>4.RI.4 Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject.</p> <p>4.RI.5 Describe the overall structure (chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in a text or part of a text.</p> <p>4.W.7 Conduct short research projects that build knowledge through investigation of different aspects of a topic.</p> <p>4.W.10 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.</p>		
<p>Lesson Overview:</p> <p>In this lesson, students will be able to explain how Earth and the planets move by observing constellations and patterns of change in the night sky. Telescopes and space probes have extended these observations far out into space.</p>	<p>Lesson Objective(s):</p> <p>In this lesson, students will be able to</p> <ul style="list-style-type: none"> • Describe the motions of Earth and the moon. • Explain how these motions cause phases of the moon. • Relate a day and year to the motions of Earth. • Describe the causes of the seasons. • Demonstrate two motions of planets- rotation and revolution. • Describe some characteristics of the star that is at the center of our solar system. • Distinguish among planets, asteroids, and comets. • Construct scale models of the solar system. • Explain how the planets are divided into two groups- Inner planets and outer planets • Analyze and critique theories regarding the formation of planets’ moons and rings. 	
<p>Vocabulary:</p> <p>question, hypothesis, data, collect, analyze, conclusion, prediction, investigation, experiment, support, observation, inference, satellite, orbit, phases, revolution, axis,</p>	<p>Focus Question(s):</p> <ul style="list-style-type: none"> • How are the objects in our universe the same and how are they different? • How does the relationship between Earth and the sun affect our seasons? • What constitutes a year on the various planets? Why 	

rotation, solar system, star, planet, asteroid, comet, inner planets, outer planets, gas giants, telescope, space probe

are they different?

- What predictable observable pattern occurs as a result of the interaction between the earth, sun, and moon?

Description of Lesson (including instructional strategies):

Day 1: 11/16/15 Chapter 1: What are the Planets Like? p. D76-D81

I can describe the planets in our solar system.

Anticipatory Set:

Teacher will explain to students that they will be learning about the planets.

Have students scan the chapter. Guide them in identifying the lesson titles and major headings and use them to outline the chapter.

Instruction and Strategies:

Help students focus on the supporting facts and details for the main idea: The inner planets- Mercury, Venus, Earth and Mars are small and rocky. The outer planets- Jupiter, Saturn, Uranus and Neptune are gas giants.

- Teacher will lead a whole class discussion; ask the class, what are the planets like? (The inner planets-Mercury, Venus, Earth and Mars are small and rocky. The outer planets- Jupiter, Saturn, Uranus and Neptune are gas giants.)
- Teacher will review the students on the different planets.
- Students will review their notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- **Music Link: Twinkle, Twinkle, Little Planet?**
Have each group pick one planet and write a song that describes the facts currently known about the planet. Suggest students use the “Twinkle, Twinkle, Little Star” for their songs. Ask volunteers to sing their songs to the class.
- **Planet Riddles Worksheet**

Description of Lesson (including instructional strategies):

Day 2: 11/17/15 Chapter 4: How Do People study the Solar System? p. D84-D89

I can construct and use a simple telescope.

Anticipatory Set:

Teacher will explain to students that they will be learning about how people study the solar system. Have students scan the chapter. Guide them in identifying the lesson titles and major headings and use them to outline the chapter.

Instruction and Strategies:

Help students focus on the supporting facts and details for the main idea: A telescope is a device people use to observe distant objects. Crewed missions and space probes are other ways to study objects in space.

- Teacher will lead a whole class discussion; ask the class, how do people study the solar system? (A telescope is a device people use to observe distant objects. Crewed missions and space probes are other ways to study objects in space.)
- Preview the vocabulary terms on p. D84
- Read as a class pages D84-D89.

- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- Students will copy and define the vocabulary terms on p. D84.
- Have students copy and answer the review questions on p. D89.

Description of Lesson (including instructional strategies):

Day 3: 11/18/15 Chapter 4: How Do People study the Solar System? p. D84-D89 (continuation)

I can construct and use a simple telescope.

Anticipatory Set:

Teacher will explain to students that they will be learning about how people study the solar system. Have students scan the chapter. Guide them in identifying the lesson titles and major headings and use them to outline the chapter.

Instruction and Strategies:

Help students focus on the supporting facts and details for the main idea: A telescope is a device people use to observe distant objects. Crewed missions and space probes are other ways to study objects in space.

- Teacher will lead a whole class discussion; ask the class, how do people study the solar system? (A telescope is a device people use to observe distant objects. Crewed missions and space probes are other ways to study objects in space.)
- Review the vocabulary terms on p. D84
- Review pages D84-D89.
- Teacher will ask comprehension questions throughout the lesson.
- **Telescopes:** Have students construct a simple telescope and use it to observe some objects in space.

Materials: toilet paper rolls, tape, crayons/markers

Description of Lesson (including instructional strategies):

Day 4: 11/19/15 Science through Time: Discovering the Planets p.D90-D91

I can connect the chapter concepts with the history of science.

Anticipatory Set:

Have students scan the chapter. Guide them in identifying the lesson titles and major headings and use them to outline the chapter.

Instruction and Strategies:

Help students focus on the supporting facts and details for the main idea: What observation tools helped people study their chosen planet.

- Read as a class pages D90-D91.
- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- Have students copy and answer the Think About It questions on p. D91.

Day 5: 11/20/15 People in Science: Clyde Tombaugh: Astronomer, Inventor p. D92

I can connect chapter concepts with the contributions of scientists.

Anticipatory Set:

Have students scan the chapter. Guide them in identifying the lesson title and then to outline the article.

Instruction and Strategies:

- Read as a class pages D92.
- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- Have students copy and answer the Think About It questions on p. D92.
- Sundial: How can you make an instrument that uses the sun to tell time? P. D93

Formative Assessment:

Students will complete the review questions from each lesson.

Closure:

Students will share with the rest of the class their understanding of the planets and other objects in space.

Independent Practice:

Students will work independently to complete the review questions for each lesson.

Resources:

Harcourt Science- 4th Grade

paper

masking tape

glue

crayons/markers/paint

Pencil

scissors

toilet paper/paper towel rolls

<p>Content: Science: Matter and Its Changes Review</p>	<p>Grade: 4th</p>	<p>Timeline: 45 minutes 11/23/15-11/25/15</p>
<p>Science Standard(s): 4.3.1 Demonstrate that the mass of a whole object is always the same as the sum of the mass of its parts. Mass is a measure of how much matter is in an object. 4.3.2 Investigate, observe, and explain that heat is produced when one object rubs against another, such as one’s hands rubbing together.</p> <p>CCSS ELA Standards: 4.RI.1 Refer to key details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text. 4.RI.2 Determine the main idea of a text and explain how it is supported by key details; summarize the text. 4.RI.3 Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text. 4.RI.4 Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area. 4.W.4 Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1-3 above.)</p>		
<p>Lesson Overview:</p> <p>In this lesson, students will be able to explain how mass, volume, solubility, and density are basic properties of matter. These properties of solids, liquids, and gases depend directly on the structure and arrangement of the particles that make up matter.</p>	<p>Lesson Objective(s):</p> <p>In this lesson, students will be able to</p> <ul style="list-style-type: none"> • Conclude that matter has three forms: solid, liquid, and gas. • Recognize that heat can cause change in the state of matter. • Conduct tests, compare data, and draw conclusions about states of matter. • Use numerical data to measure, describe, and compare physical properties of matter. • Conduct tests, compare data, and draw conclusions about mass, volume, and density. • Identify buoyancy as a physical property of matter. • Conduct tests, compare data, and draw conclusions about buoyancy of different materials. • Recognize that some materials combine to form solutions. • Describe a physical change. • Identify a chemical change. • Recognize that chemical and physical changes are used in the manufacturing of steel. 	
<p>Vocabulary: question, hypothesis, data, collect, analyze, conclusion, prediction, investigation, experiment, support, observation, inference, matter, mass, solid, liquid, gas, volume, density,</p>	<p>Focus Question(s):</p> <ul style="list-style-type: none"> • How is mass affected when a physical change occurs? • How is heat produced? • How can heat change the property of a substance? 	

solution, dissolve, solubility, buoyancy, physical change, chemical change, reactions	
---	--

Description of Lesson (including instructional strategies):

Day 1: 11/23/15 What are the Three States of Matter? p. E4

- I can conclude that matter has three forms: solid, liquid, and gas.
- I can recognize that heat can cause change in the state of matter.

Anticipatory Set:

Teacher will explain to students that they will be learning about the three states of matter.

Have students scan the chapter. Guide them in identifying the lesson titles and major headings and use them to outline the chapter.

Instruction and Strategies:

Help students focus on the supporting facts and details for the main idea: Matter takes up space.

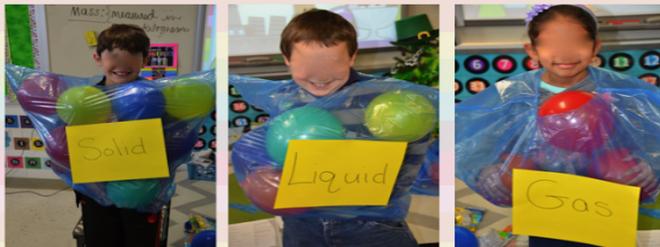
- Teacher will lead a whole class discussion; ask the class,
 - What are the three states of matter?
 - Can you give an example of each?
- Review the vocabulary terms on p. E6
- Have students complete the Investigation: **Molecules in Matter:**
Materials: 3 trash bags, balloons, tape and paper
 - Challenge students to observe molecules in matter. Place a trash bag around three students. Fill one bag with lots of balloons so that they would not move around (solid). In another bag, place a few balloons so that they would move around one another (liquid). In the last bag, place only three balloons so that they would move quickly all over the place (gas). Then, one at a time, have each student jump up and down. Have the other students make observations and discuss what occurred in each state of matter. Then classify the different matter as solid, liquid, or gas.
 - Explain to the students that the particles in a solid are close together, like neat and even stacks of tiny balls. Each particle moves back and forth at one point. When matter is a liquid, its particles slip and slide around each other. They move from place to place but they still stay close to each other. Particles in gases move fast and do not stay close together.
- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.

MOLECULES IN MATTER



I began this observation by place trash bags around three students I stuffed one bag with lots of balloons so that they would not move around (solid) In the second bag, I place a few balloons so that they would move around one another (liquid) And in the final bag, I placed only three balloons so they would move quickly all over the place (gas). Then, (one at a time), each student jumped up and down and all around. As they were jumping, my other students were making observations and showing what they saw with their fruit loops.

MOLECULES IN MATTER



After we made our observations, we discussed what occurred in each state of matter. Then, we classified our matter friends as a solid, liquid, or gas {you can use the labels provided in the unit}

Description of Lesson (including instructional strategies):

Day 2: 11/24/15 What is Matter?

- I can conclude that matter has three forms: solid, liquid, and gas.
- I can recognize that heat can cause change in the state of matter.

Anticipatory Set:

Teacher will explain to students that they will be learning about the three states of matter. Have students scan the chapter. Guide them in identifying the lesson titles and major headings and use them to outline the chapter.

Instruction and Strategies:

Help students focus on the supporting facts and details for the main idea: Matter takes up space.

- Teacher will lead a whole class discussion; ask the class,
 - What are the three states of matter?
 - Can you give an example of each?
- Review the vocabulary terms on p. E6
- Have students complete the Investigation: **States of Matter with Cheerios**

Materials: States of matter worksheet, cheerios, glue and a pencil

- Challenge students to explain what they observed in molecules in matter from the previous lesson. Provide students with cheerios to use as a representation of particles. Cereal that is glued closely together and would not move around is solid.

place a few cereal close together but not tight so that they would move around one another is liquid. Last, place only three pieces of cereal so that they would move quickly all over the place is a gas. Then classify the different matter as solid, liquid, or gas. Have them write down the physical properties of each matter and provide examples of each.

- Explain to the students that the particles in a solid are close together, like neat and even stacks of tiny balls. Each particle moves back and forth at one point. When matter is a liquid, its particles slip and slide around each other. They move from place to place but they still stay close to each other. Particles in gases move fast and do not stay close together.
- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.



Description of Lesson (including instructional strategies):

Day 3: 11/25/15 Chapter 4: What are Chemical and Physical Changes? p. E26

- I can use numerical data to measure, describe, and compare physical properties of matter.
- I can conduct tests, compare data, and draw conclusions about mass, volume, and density.

Anticipatory Set:

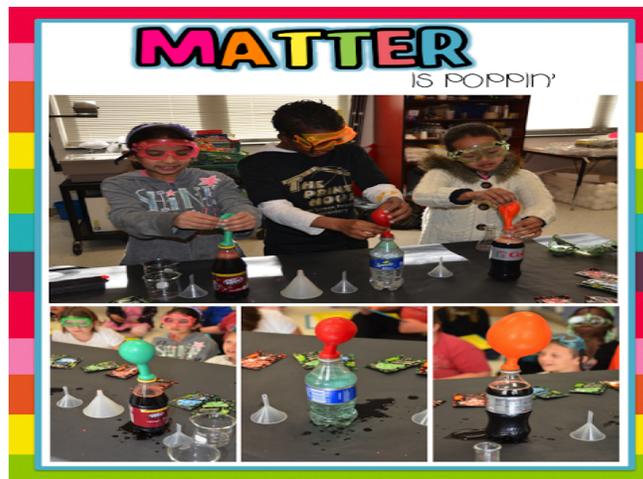
Teacher will explain to students that they will be learning about chemical and physical changes. Have students scan the chapter. Guide them in identifying the lesson titles and major headings and use them to outline the chapter.

Instruction and Strategies:

Help students focus on the supporting facts and details for the main idea: Matter takes up space.

- Teacher will lead a whole class discussion; ask the class,
 - What are the three states of matter?
 - Can you give an example of each?
- Review the vocabulary terms on p. E26
- Have students complete the Investigation: **Molecules in Matter:**
Materials: 3 different types of soda, balloons, safety goggles, funnel and pop rocks candy

- Challenge the students to observe what happens inside the soda as the liquid reacts with the candy. Using a funnel, place an entire package of pop rocks into a balloon. Place the balloon over the mouth of a bottle of soda. ***Make sure not to drop the pop rocks into the soda!*** Stretch the mouth of the balloon over the mouth of the bottle, but make sure the candy content does not fall into the soda. Grab the balloon and pour the candy into the soda.
 - Explain to the students that the balloons should be inflating, even if the change is only slight. Each of the tiny candy contains a small amount of the gas “carbon dioxide”. These tiny carbon dioxide bubbles make the popping sound you hear when they burst free from their candy shells. The soda contains pressurized carbon dioxide gas, which causes the balloon to inflate. When the candy is dropped into the soda, some carbon dioxide is able to escape from the soda and because the gas has nowhere to go in the bottle, it rises into the balloon.
- Students will take notes as teacher discusses and lectures.
 - Teacher will ask comprehension questions throughout the lesson.



Formative Assessment:

Students will complete the review questions from each lesson.

Closure:

Students will share with the rest of the class their understanding of matter and its changes.

Independent Practice:

Students will work independently to complete the review questions for each lesson.

Resources:

- | | | | |
|-------------------------------|-----------------------------|------------------|--------------|
| - Harcourt Science- 4th Grade | - paper | - balloon | - glue |
| - pop rocks candy | - 3 different types of soda | - safety goggles | - trash bags |
| - cheerios cereal | - Pencil | - funnel | |

states of matter

name _____

Use the pieces of cereal to show a representation of the particles in each state of matter.

Solid

Liquid

Gas

Content: Science: Heat- Energy on the Move	Grade: 4 th	Timeline: 45 minutes 11/30/15-12/04/15
--	-------------------------------	--

<p>Science Standard(s):</p> <p>4.3.1 Demonstrate that the mass of a whole object is always the same as the sum of the mass of its parts. Mass is a measure of how much matter is in an object.</p> <p>4.3.2 Investigate, observe, and explain that heat is produced when one object rubs against another, such as one’s hands rubbing together.</p> <p>4.3.4 Investigate, observe, and explain that things that give off light often also give off heat. - Heat: a form of energy characterized by random motion at the molecular level.</p> <p>4.3.5 Observe and describe the things that give off heat, such as people, animals, and the Sun.</p> <p>4.3.6 Explain that energy in fossil fuels comes from plants that grew long ago. - Fossil Fuel: a fuel, such as natural gas or coal that was formed a long time ago from decayed plants and animals.</p> <p>4.3.7 Describe how using one form of energy produces another form of energy. Ex: gasoline fuels motors to produce motion, heat boils water to produce steam, solar light, is captured to produce electricity.</p> <p>CCSS ELA Standards:</p> <p>4.RI.1 Refer to key details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.</p> <p>4.RI.2 Determine the main idea of a text and explain how it is supported by key details; summarize the text.</p> <p>4.RI.3 Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.</p> <p>4.RI.4 Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.</p> <p>4.W.4 Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1-3 above.)</p>
--

<p>Lesson Overview:</p> <p>In this lesson, students will be able to explain how adding thermal energy causes melting and boiling. Convection, conduction, and radiation are part of the ways we use thermal energy every day.</p>	<p>Lesson Objective(s):</p> <p>In this lesson, students will be able to</p> <ul style="list-style-type: none"> • Recognize that thermal energy is the motion of particles of matter. • Observe and record changes in the states of matter caused by the addition or reduction of thermal energy. • Explain how thermal energy and temperature differ. • Explain that adding or removing heat from a substance change its state of matter. • Identify conduction as a physical property of matter. • Recognize that thermal energy can be transferred from object to another. • Analyze information about temperature by using thermometers. • Identify ways to produce and use thermal energy. • Explain that the energy that comes from the sun to Earth can be used by people. • Evaluate the impact of research and technology on science thought, society, and the environment. • Identify careers related to science.
--	--

<p>Vocabulary: question, hypothesis, data, collect, analyze, conclusion, prediction, investigation, experiment, support, observation, inference, matter, mass, solid, liquid, gas, energy, kinetic energy, thermal energy, temperature, heat, conduction, convection, radiation, infrared radiation, fuel, solar energy</p>	<p>Focus Question(s):</p> <ul style="list-style-type: none"> • How is mass affected when a physical change occurs? • How is heat produced? • What are objects that produce heat? • What is a fossil fuel? • What does one form of energy produce another form of energy? • How can heat change the property of a substance?
--	--

Description of Lesson (including instructional strategies):

Day 1: 11/30/15 Chapter 1: How Does Heat Affect Matter? p. E40–E45

- I can recognize that thermal energy is the motion of particles of matter.
- I can explain how thermal energy and temperature differ.

Anticipatory Set:

Teacher will explain to students that they will be learning about how heat affects matter. Have students scan the chapter. Guide them in identifying the lesson titles and major headings and use them to outline the chapter.

Instruction and Strategies:

Help students focus on the supporting facts and details for the main idea: Energy is the ability to cause change.

- Teacher will lead a whole class discussion; ask the class,
 - What is energy?
 - What are some ways you use energy?
 - How can heat cause changes in matter?
- Have students complete the Investigation: Changes in a Heated Balloon p. E40
Materials: desk lamp, bulb, safety goggles, 3 rubber balloons, string, ruler, stopwatch or clock with second hand
- Preview the vocabulary terms on p. E42
- Read as a class pages E40-E45.
- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- Students will copy and define the vocabulary terms on p. E42.
- Have students' copy and answer the review questions on p. E45.

Description of Lesson (including instructional strategies):

Day 2: 12/01/15 Chapter 2: How Can Thermal Energy Be Transferred? p. E46-E53

- I can explain that adding or removing heat from a substance can change its state of matter.
- I can identify conduction as a physical property of matter.
- I can recognize that thermal energy can be transferred from one object to another.

Anticipatory Set:

Teacher will explain to students that they will be learning about how thermal energy can be transferred. Have students scan the chapter. Guide them in identifying the lesson titles and major headings and use them to outline the chapter.

Instruction and Strategies:

Help students focus on the supporting facts and details for the main idea: Heat is the transfer of thermal energy from one piece of matter to another.

- Teacher will lead a whole class discussion; ask the class,
 - How do you use thermal energy?
 - What happens to the particles in matter if thermal energy is increased?
- Have students complete the Investigation: Hot Air
Materials: sheet of construction paper, scissors, straight pin, piece of thread, desk lamp, bulb
- Preview the vocabulary terms on p. E48
- Read as a class pages E46-E53.
- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- Students will copy and define the vocabulary terms on p. E48.
- Have students' copy and answer the review questions on p. E53.
- Art Link: **Design A Hot Air Balloon** p. E51

Have students work in small groups to design miniature hot-air balloons that can actually be made to stay in the air by using the thermal energy from a light bulb. Suggest that students select materials that have little mass for making their balloons. Have students share their completed designs with their classmates.

Description of Lesson (including instructional strategies):

Day 3: 12/02/15 Chapter 3: How Is Thermal Energy Produced and Used? p. E54-E59

- I can analyze information about temperature by using thermometers.
- I can identify ways to produce and use thermal energy.
- I can explain that the energy that comes from the sun to Earth can be used by people.

Anticipatory Set:

Teacher will explain to students that they will be learning about how thermal energy is produced and used. Have students scan the chapter. Guide them in identifying the lesson titles and major headings and use them to outline the chapter.

Instruction and Strategies:

Help students focus on the supporting facts and details for the main idea: Much of the thermal energy used by people today comes from burning fuels that contain carbon.

- Teacher will lead a whole class discussion; ask the class,
 - How does thermal energy differ from temperature?
 - How is thermal energy transferred?
- Have students complete the Investigation: Temperatures in a Solar Cooker p. E54
Materials: 2 sheets of graph paper, shoe box lid, aluminum foil, thermometer, clock, scissors, poster board, glue, string
- Preview the vocabulary terms on p. E56
- Read as a class pages E54-E59.
- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- Students will copy and define the vocabulary terms on p. E54.
- Have students' copy and answer the review questions on p. E59.

- **Observing Effects of Solar Energy p. E57:**
 - Discuss with students that some radiation given off by the sun helps heat homes. Explain that a roof's color can affect how much the sun's radiation heats a home. Challenge students to analyze the effect of color on solar energy.
 - Provide groups of students with empty shoeboxes. Have each group place a thermometer inside its box and cover the box with a different color paper. Put all the boxes in a sunny location. After twenty-five minutes, have each group record the temperatures in the box. Have groups combine their data in a class chart.
 - Students should see that boxes covered with dark-colored paper became warmer than did boxes covered with light colored paper.
Materials: shoeboxes, construction paper, thermometer, clock, pencil

Description of Lesson (including instructional strategies):

Day 4: 12/03/15 Science and Technology: Refrigerants. p. E60-E61

- I can evaluate the impact of research and technology on scientific thought, society, and the environment.
- I can identify careers related to science.

Anticipatory Set:

Have students scan the chapter. Guide them in identifying the lesson title and then to outline the article.

Instruction and Strategies:

- Read as a class pages E60-E61.
- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- Have students' copy and answer the Think About It questions on p. E61.

Description of Lesson (including instructional strategies):

Day 5: 12/04/15 People in Science- Frederick McKinley Jones: Inventor p. E62

- I can connect chapter concepts with the contributions of scientists.

Anticipatory Set:

Have students scan the chapter. Guide them in identifying the lesson title and then to outline the article.

Instruction and Strategies:

- Read as a class pages E62.
- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- Have students' copy and answer the Think About It questions on p. E62.
- **Compare Conductors:** Which materials conduct thermal energy faster? p.E63 (TE)
Materials: 3 thermometers, warm tap water, tape, jar, plastic, wood, and metal spoons of about the same size

Formative Assessment:

Students will complete the review questions from each lesson.

Closure:

Students will share with the rest of the class their understanding of heat- energy on the move.

Independent Practice:

Students will work independently to complete the review questions for each lesson.

Resources:

- Harcourt Science- 4th Grade, paper, shoeboxes, construction paper, thermometer, clock, pencil 2 sheets of graph paper, shoe box lid, aluminum foil, thermometer, clock, scissors, poster board, glue, string sheet of construction paper, scissors, straight pin, piece of thread, desk lamp, bulb desk lamp, bulb, safety goggles, 3 rubber balloons, string, ruler, stopwatch or clock with second hand, 3 thermometers, warm tap water, tape, jar, plastic, wood, and metal spoons of about the same size

Content: Science: Sound	Grade: 4 th	Timeline: 45 minutes 12/07/15-12/11/15
<p>Science Standard(s):</p> <p>4.3.1 Demonstrate that the mass of a whole object is always the same as the sum of the mass of its parts. Mass is a measure of how much matter is in an object.</p> <p>4.3.2 Investigate, observe, and explain that heat is produced when one object rubs against another, such as one’s hands rubbing together.</p> <p>4.3.4 Investigate, observe, and explain that things that give off light often also give off heat. - Heat: a form of energy characterized by random motion at the molecular level.</p> <p>4.3.5 Observe and describe the things that give off heat, such as people, animals, and the Sun.</p> <p>4.3.6 Explain that energy in fossil fuels comes from plants that grew long ago. - Fossil Fuel: a fuel, such as natural gas or coal that was formed a long time ago from decayed plants and animals.</p> <p>4.3.7 Describe how using one form of energy produces another form of energy. Ex: gasoline fuels motors to produce motion, heat boils water to produce steam, solar light, is captured to produce electricity.</p> <p>CCSS ELA Standards:</p> <p>4.RI.1 Refer to key details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.</p> <p>4.RI.2 Determine the main idea of a text and explain how it is supported by key details; summarize the text.</p> <p>4.RI.3 Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.</p> <p>4.RI.4 Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.</p> <p>4.W.4 Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1-3 above.)</p>		
<p>Lesson Overview:</p> <p>In this lesson, students will be able to explain how sound waves are regular patterns of change in matter. Properties of sounds can be changed in predictable ways. Sounds interact with matter in predictable ways.</p>	<p>Lesson Objective(s):</p> <p>In this lesson, students will be able to</p> <ul style="list-style-type: none"> • Collect and analyze data about how sounds are made. • Recognize that sound energy can be carried from one p to another by waves. • Observe how sounds differ. • Compare and contrast loudness and pitch. • Recognize that sound travels at different speeds through different media. • Describe how an echo forms. • Explain what causes a sonic boom. • Identify careers related to science. 	
<p>Vocabulary:</p> <p>question, hypothesis, data, collect, analyze, conclusion, prediction, investigation, experiment, support, observation, inference, sound, comparison, sound wave, amplitude, wavelength, loudness, pitch, speed of</p>	<p>Focus Question(s):</p> <ul style="list-style-type: none"> • How is mass affected when a physical change occurs? • How is heat produced? • What are objects that produce heat? • What is a fossil fuel? • What does one form of energy produce another form of energy? 	

sound, echo, sonic boom

- How can heat change the property of a substance?

Description of Lesson (including instructional strategies):

Day 1: 12/07/15 Lesson 1: What is Sound? p. E66–E75

- I can collect and analyze data about how sounds are made.
- I can recognize that sound energy can be carried from one place to another by waves.

Anticipatory Set:

Teacher will explain to students that they will be learning about sound. Have students scan the chapter. Guide them in identifying the lesson titles and major headings and use them to outline the chapter.

Instruction and Strategies:

Help students focus on the supporting facts and details for the main idea: Sound is made by vibrating objects.

- Teacher will lead a whole class discussion; ask the class,
 - What is energy?
 - Is sound a form of energy?
- Have students complete the Investigation: Sound from a Ruler p. E68
Materials: plastic ruler
- Preview the vocabulary terms on p. E68
- Read as a class pages E66-E75.
- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- Students will copy and define the vocabulary terms on p. E68.
- Have students' copy and answer the review questions on p. E75.
- **Observing Sound Traveling p. E71**
 - Invite students to hear sound through a string. Provide pairs of students with two paper cups and string. Have them make a small hole in the bottom of each cup and feed the string through the opening (from outside to inside) and make a knot around a paper clip.
 - Ask each student to take one cup and walk away from his/her partner until the string is tight. Have one student speak softly into one cup while the other holds the other cup to his/her ear. Have the student listening describe what happens. *The student can be heard.*
 - Have students switch roles and repeat. Ask students to conclude what this shows about how sound travels. *Sound can travel through solids.* Challenge students to test other solids for their abilities to conduct sound.
Materials: two paper cups, string, paper clip

Description of Lesson (including instructional strategies):

Day 2: 12/08/15 Holiday

Description of Lesson (including instructional strategies):**Day 3: 12/09/15 Lesson 2: Why Do Sounds Differ? p. E76-E81**

- I can observe how sounds differ.
- I can compare and contrast loudness and pitch.

Anticipatory Set:

Teacher will explain to students that they will be learning about why sounds differ. Have students scan the chapter. Guide them in identifying the lesson titles and major headings and use them to outline the chapter.

Instruction and Strategies:

Help students focus on the supporting facts and details for the main idea: Loudness is a measure of the sound energy reaching the ears.

- Teacher will lead a whole class discussion; ask the class,
 - What is sound?
 - How does sound travel?
- Have students complete the Investigation: Making Different Sounds p. E76
Materials: safety goggles, foam cup, long rubber band, paper clip, ruler, masking tape
- Preview the vocabulary terms on p. E78
- Read as a class pages E76-E81.
- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- Students will copy and define the vocabulary terms on p. E78.
- Have students' copy and answer the review questions on p. E81.

Description of Lesson (including instructional strategies):**Day 4: 12/10/15 Lesson 3: How Do Sound Waves Travel? p. E82-E89**

- I can recognize that sound travels at different speeds through different media.
- I can describe how an echo forms.
- I can explain what causes a sonic boom.

Anticipatory Set:

Teacher will explain to students that they will be learning about how sound waves travel. Have students scan the chapter. Guide them in identifying the lesson titles and major headings and use them to outline the chapter.

Instruction and Strategies:

Help students focus on the supporting facts and details for the main idea: Sound waves travel at different speeds through different materials.

- Teacher will lead a whole class discussion; ask the class,
 - What are two ways sounds can differ from one another?
 - What causes sound?
- Have students complete the Investigation: Hearing Sounds p. E82
Materials: large metal spoon, metal pot, red crayon
- Preview the vocabulary terms on p. E84
- Read as a class pages E82-E89.

- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- Students will copy and define the vocabulary terms on p. E84.
- Have students' copy and answer the review questions on p. E89.
- **Observing Sound Absorption:**
 - Challenge students to decrease the loudness of an alarm clock. Provide groups with an alarm clock, a shoe box lid, and assorted materials, such as empty foam and cardboard egg cartons, cotton batting, aluminum foil, and newspaper.
 - Have them turn the alarm clock on and put the clock in the empty box with the lid on. Ask students to record their observations, paying attention to the clock's loudness. Direct each group to completely cover the inside of the box and the lid with one of the provided materials and again set off the clock.
 - Have them compare these observations with those made earlier and explain any differences. *The materials with rough surfaces absorbed or refracted the sounds, making them less loud.*
 - Challenge students to choose and test other materials for sound absorption.
Materials: alarm clock, a shoe box lid, and assorted materials, such as empty foam and cardboard egg cartons, cotton batting, aluminum foil, and newspaper

Description of Lesson (including instructional strategies):

Day 5: 12/11/15 Science and Technology: Active Noise Control. p. E90-E91

- I can evaluate the impact of research and technology on scientific thought, society, and the environment.
- I can identify careers related to science.

Anticipatory Set:

Have students scan the chapter. Guide them in identifying the lesson title and then to outline the article.

Instruction and Strategies:

- Read as a class pages E90-E91.
- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- Have students' copy and answer the Think About It questions on p. E91.

Description of Lesson (including instructional strategies):

People in Science- Amar Gopal Bose: Sound Engineer p. E92

- I can connect chapter concepts with the contributions of scientists.

Anticipatory Set:

Have students scan the chapter. Guide them in identifying the lesson title and then to outline the article.

Instruction and Strategies:

- Read as a class pages E92.
- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- Have students' copy and answer the Think About It questions on p. E92.
- **Sounds of Water Glass:** How do water glasses make sounds with different pitches? p.E93 (TE)

Materials: 4 or 5 identical water glasses, water, metal spoon

Formative Assessment:

Students will complete the review questions from each lesson.

Closure:

Students will share with the rest of the class their understanding of sound.

Independent Practice:

Students will work independently to complete the review questions for each lesson.

Resources:

Harcourt Science- 4th Grade, paper, plastic ruler, pencil, safety goggles, foam cup, long rubber band, paper clip, ruler, masking tape, large metal spoon, metal pot, red crayon, alarm clock, a shoe box lid, and assorted materials, such as empty foam and cardboard egg cartons, cotton batting, aluminum foil, and newspaper, 4 or 5 identical water glasses, water, metal spoon

Content: Science: Sound	Grade: 4 th	Timeline: 45 minutes 12/14/15-12/18/15
<p>Science Standard(s):</p> <p>4.3.1 Demonstrate that the mass of a whole object is always the same as the sum of the mass of its parts. Mass is a measure of how much matter is in an object.</p> <p>4.3.2 Investigate, observe, and explain that heat is produced when one object rubs against another, such as one’s hands rubbing together.</p> <p>4.3.4 Investigate, observe, and explain that things that give off light often also give off heat. - Heat: a form of energy characterized by random motion at the molecular level.</p> <p>4.3.5 Observe and describe the things that give off heat, such as people, animals, and the Sun.</p> <p>4.3.6 Explain that energy in fossil fuels comes from plants that grew long ago. - Fossil Fuel: a fuel, such as natural gas or coal that was formed a long time ago from decayed plants and animals.</p> <p>4.3.7 Describe how using one form of energy produces another form of energy. Ex: gasoline fuels motors to produce motion, heat boils water to produce steam, solar light, is captured to produce electricity.</p> <p>CCSS ELA Standards:</p> <p>4.RI.1 Refer to key details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.</p> <p>4.RI.2 Determine the main idea of a text and explain how it is supported by key details; summarize the text.</p> <p>4.RI.3 Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.</p> <p>4.RI.4 Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.</p> <p>4.W.4 Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1-3 above.)</p>		
<p>Lesson Overview:</p> <p>In this lesson, students will be able to explain how sound waves are regular patterns of change in matter. Properties of sounds can be changed in predictable ways. Sounds interact with matter in predictable ways.</p>	<p>Lesson Objective(s):</p> <p>In this lesson, students will be able to</p> <ul style="list-style-type: none"> • Collect and analyze data about how sounds are made. • Recognize that sound energy can be carried from one p to another by waves. • Observe how sounds differ. • Compare and contrast loudness and pitch. • Recognize that sound travels at different speeds through different media. • Describe how an echo forms. • Explain what causes a sonic boom. • Identify careers related to science. 	
<p>Vocabulary:</p> <p>question, hypothesis, data, collect, analyze, conclusion, prediction, investigation, experiment, support, observation, inference, sound, comparison, sound wave, amplitude, wavelength, loudness, pitch, speed of</p>	<p>Focus Question(s):</p> <ul style="list-style-type: none"> • How is mass affected when a physical change occurs? • How is heat produced? • What are objects that produce heat? • What is a fossil fuel? • What does one form of energy produce another form of energy? 	

sound, echo, sonic boom

- How can heat change the property of a substance?

Description of Lesson (including instructional strategies):

Day 1: 12/14/15 Lesson 1: What is Sound? p. E66–E75

- I can collect and analyze data about how sounds are made.
- I can recognize that sound energy can be carried from one place to another by waves.

Anticipatory Set:

Teacher will explain to students that they will be learning about sound. Have students scan the chapter. Guide them in identifying the lesson titles and major headings and use them to outline the chapter.

Instruction and Strategies:

Help students focus on the supporting facts and details for the main idea: Sound is made by vibrating objects.

- Teacher will lead a whole class discussion; ask the class,
 - What is energy?
 - Is sound a form of energy?
- Have students complete the Investigation: Sound from a Ruler p. E68
Materials: plastic ruler
- Preview the vocabulary terms on p. E68
- Read as a class pages E66-E75.
- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- Students will copy and define the vocabulary terms on p. E68.
- Have students' copy and answer the review questions on p. E75.
- **Observing Sound Traveling p. E71**
 - Invite students to hear sound through a string. Provide pairs of students with two paper cups and string. Have them make a small hole in the bottom of each cup and feed the string through the opening (from outside to inside) and make a knot around a paper clip.
 - Ask each student to take one cup and walk away from his/her partner until the string is tight. Have one student speak softly into one cup while the other holds the other cup to his/her ear. Have the student listening describe what happens. *The student can be heard.*
 - Have students switch roles and repeat. Ask students to conclude what this shows about how sound travels. *Sound can travel through solids.* Challenge students to test other solids for their abilities to conduct sound.
Materials: two paper cups, string, paper clip

Description of Lesson (including instructional strategies):

Day 2: 12/15/15 Lesson 2: Why Do Sounds Differ? p. E76-E81

- I can observe how sounds differ.
- I can compare and contrast loudness and pitch.

Anticipatory Set:

Teacher will explain to students that they will be learning about why sounds differ. Have students scan the chapter. Guide them in identifying the lesson titles and major headings and use them to outline the chapter.

Instruction and Strategies:

Help students focus on the supporting facts and details for the main idea: Loudness is a measure of the sound energy reaching the ears.

- Teacher will lead a whole class discussion; ask the class,
- What is sound?
- How does sound travel?
- Have students complete the Investigation: Making Different Sounds p. E76
Materials: safety goggles, foam cup, long rubber band, paper clip, ruler, masking tape
- Preview the vocabulary terms on p. E78
- Read as a class pages E76-E81.
- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- Students will copy and define the vocabulary terms on p. E78.
- Have students' copy and answer the review questions on p. E81.

Description of Lesson (including instructional strategies):

Day 3: 12/16/15 Lesson 3: How Do Sound Waves Travel? p. E82-E89

- I can recognize that sound travels at different speeds through different media.
- I can describe how an echo forms.
- I can explain what causes a sonic boom.

Anticipatory Set:

Teacher will explain to students that they will be learning about how sound waves travel. Have students scan the chapter. Guide them in identifying the lesson titles and major headings and use them to outline the chapter.

Instruction and Strategies:

Help students focus on the supporting facts and details for the main idea: Sound waves travel at different speeds through different materials.

- Teacher will lead a whole class discussion; ask the class,
- What are two ways sounds can differ from one another?
- What causes sound?
- Have students complete the Investigation: Hearing Sounds p. E82
Materials: large metal spoon, metal pot, red crayon
- Preview the vocabulary terms on p. E84
- Read as a class pages E82-E89.
- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- Students will copy and define the vocabulary terms on p. E84.
- Have students' copy and answer the review questions on p. E89.
- **Observing Sound Absorption:**
 - Challenge students to decrease the loudness of an alarm clock. Provide groups with an alarm clock, a shoe box lid, and assorted materials, such as empty foam and cardboard egg cartons, cotton batting, aluminum foil, and newspaper.

- Have them turn the alarm clock on and put the clock in the empty box with the lid on. Ask students to record their observations, paying attention to the clock's loudness. Direct each group to completely cover the inside of the box and the lid with one of the provided materials and again set off the clock.
- Have them compare these observations with those made earlier and explain any differences. *The materials with rough surfaces absorbed or refracted the sounds, making them less loud.*
- Challenge students to choose and test other materials for sound absorption.
Materials: alarm clock, a shoe box lid, and assorted materials, such as empty foam and cardboard egg cartons, cotton batting, aluminum foil, and newspaper

Description of Lesson (including instructional strategies):

Day 4: 12/17/15 Science and Technology: Active Noise Control. p. E90-E91

- I can evaluate the impact of research and technology on scientific thought, society, and the environment.
- I can identify careers related to science.

Anticipatory Set:

Have students scan the chapter. Guide them in identifying the lesson title and then to outline the article.

Instruction and Strategies:

- Read as a class pages E90-E91.
- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- Have students' copy and answer the Think About It questions on p. E91.

Description of Lesson (including instructional strategies):

Day 5: 12/18/15 People in Science- Amar Gopal Bose: Sound Engineer p. E92

- I can connect chapter concepts with the contributions of scientists.

Anticipatory Set:

Have students scan the chapter. Guide them in identifying the lesson title and then to outline the article.

Instruction and Strategies:

- Read as a class pages E92.
- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- Have students' copy and answer the Think About It questions on p. E92.
- **Sounds of Water Glass:** How do water glasses make sounds with different pitches? p.E93 (TE)
Materials: 4 or 5 identical water glasses, water, metal spoon

Formative Assessment:

Students will complete the review questions from each lesson.

Closure:

Students will share with the rest of the class their understanding of sound.

Independent Practice:

Students will work independently to complete the review questions for each lesson.

Resources:

Harcourt Science- 4th Grade, paper, plastic ruler, pencil, safety goggles, foam cup, long rubber band, paper clip, ruler, masking tape, large metal spoon, metal pot, red crayon, alarm clock, a shoe box lid, and assorted materials, such as empty foam and cardboard egg cartons, cotton batting, aluminum foil, and newspaper, 4 or 5 identical water glasses, water, metal spoon

Content: Science: Light	Grade: 4 th	Timeline: 45 minutes 01/04/15-01/08/15
<p>Science Standard(s):</p> <p>4.3.1 Demonstrate that the mass of a whole object is always the same as the sum of the mass of its parts. Mass is a measure of how much matter is in an object.</p> <p>4.3.2 Investigate, observe, and explain that heat is produced when one object rubs against another, such as one’s hands rubbing together.</p> <p>4.3.4 Investigate, observe, and explain that things that give off light often also give off heat. - Heat: a form of energy characterized by random motion at the molecular level.</p> <p>4.3.5 Observe and describe the things that give off heat, such as people, animals, and the Sun.</p> <p>4.3.6 Explain that energy in fossil fuels comes from plants that grew long ago. - Fossil Fuel: a fuel, such as natural gas or coal that was formed a long time ago from decayed plants and animals.</p> <p>4.3.7 Describe how using one form of energy produces another form of energy. Ex: gasoline fuels motors to produce motion, heat boils water to produce steam, solar light, is captured to produce electricity.</p> <p>CCSS ELA Standards:</p> <p>4.RI.1 Refer to key details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.</p> <p>4.RI.2 Determine the main idea of a text and explain how it is supported by key details; summarize the text.</p> <p>4.RI.3 Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.</p> <p>4.RI.4 Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.</p> <p>4.W.4 Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1-3 above.)</p>		
<p>Lesson Overview:</p> <p>In this lesson, students will be able to explain how light travels. What light can do and learn about its color.</p>	<p>Lesson Objective(s):</p> <p>In this lesson, students will be able to</p> <ul style="list-style-type: none"> • Observe how light travels. • Explain what light can do. • Observe rainbows. • Identify light and color. • Identify careers related to science. 	
<p>Vocabulary:</p> <p>question, hypothesis, data, collect, analyze, conclusion, prediction, investigation, experiment, support, observation, inference, reflection, refraction, absorption, opaque, translucent, transparent, prism, visible spectrum</p>	<p>Focus Question(s):</p> <ul style="list-style-type: none"> • How is mass affected when a physical change occurs? • How is heat produced? • What are objects that produce heat? • What does one form of energy produce another form of energy? • How can heat change the property of a substance? 	

Description of Lesson (including instructional strategies):

Day 1: 01/04/15 Lesson 1: How Does Light Behave? p. E98–E107

- I can collect and analyze data about how what makes shadows.
- I can recognize that water affects the path of light.

Anticipatory Set:

Teacher will explain to students that they will be learning about light. Have students scan the chapter. Guide them in identifying the lesson titles and major headings and use them to outline the chapter.

Instruction and Strategies:

Help students focus on the supporting facts and details for the main idea: Light energy can cause things to change.

- Teacher will lead a whole class discussion; ask the class,
- What is light?
- Have students complete the Investigation: How Light Travels p. E98
Materials: 3 index cards, ruler, pencil, clay, small lamp without a lampshade
- Preview the vocabulary terms on p. E100
- Read as a class pages E98-E107.
- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- Students will copy and define the vocabulary terms on p. E100.
- Have students' copy and answer the review questions on p. E107.

Description of Lesson (including instructional strategies):

Day 2: 01/05/15 Lesson 2: How are light and color related ? p. E108-E113

- I can observe how many colors are in light.
- I can explain what makes a rainbow.

Anticipatory Set:

Teacher will explain to students that they will be learning about light and color. Have students scan the chapter. Guide them in identifying the lesson titles and major headings and use them to outline the chapter.

Instruction and Strategies:

Help students focus on the supporting facts and details for the main idea: White light is made up of many colors mixed together.

- Teacher will lead a whole class discussion; ask the class,
- What makes a rainbow?
- Have students complete the Investigation: Making a Rainbow p. E108
Materials: small mirror, clear glasses, water, flashlight
- Preview the vocabulary terms on p. E110
- Read as a class pages E108-E113.
- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- Students will copy and define the vocabulary terms on p. E108.

- Have students' copy and answer the review questions on p. E113.

Description of Lesson (including instructional strategies):

Day 3: 01/06/15 Science Through Time: Discovering Light and Optics p. E114-E115

- I can evaluate the impact of research and technology on scientific thought, society, and the environment.
- I can identify careers related to science.

Anticipatory Set:

Have students scan the chapter. Guide them in identifying the lesson title and then to outline the article.

Instruction and Strategies:

- Read as a class pages E114-E115.
- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- Have students' copy and answer the Think About It questions on p. E115.

Description of Lesson (including instructional strategies):

Day 4: 01/07/15 People in Science- Lewis Howard Latimer: Inventor, Engineer p. E116

- I can connect chapter concepts with the contributions of scientists.

Anticipatory Set:

Have students scan the chapter. Guide them in identifying the lesson title and then to outline the article.

Instruction and Strategies:

- Read as a class pages E116.
- Students will take notes as teacher discusses and lectures.
- Teacher will ask comprehension questions throughout the lesson.
- Have students' copy and answer the Think About It questions on p. E116.

Description of Lesson (including instructional strategies):

Day 5: 12/18/15 Science Investigations

Colors: What colors are reflected off different colors of paper? p. E117

Materials: glue, strips of colored construction paper, prism

Make a Periscope: How can you see around a corner? p. E117

Materials: glue, aluminum foil, 2 index cards, shoe box, black construction paper, flashlight

Formative Assessment:

Students will complete the review questions from each lesson.

Closure:

Students will share with the rest of the class their understanding of light.

Independent Practice:

Students will work independently to complete the review questions for each lesson.

Resources:

Harcourt Science- 4th Grade, paper, glue, aluminum foil, 2 index cards, shoe box, black construction paper, flashlight, glue, strips of colored construction paper, prism, small mirror, clear glasses, water, flashlight, 3 index cards, ruler, pencil, clay, small lamp without a lampshade