

Unit 2—Weather (FOSS® Weather & Water)

Essential Question: How do matter and energy interact to produce weather patterns?

General Skills: *quoted from the NYS Core Curriculum (Note: Correlation is provided at the “Investigation” level.)*

1. Follow safety procedures in the classroom and laboratory.
2. Safely and accurately use the following measurement tools: metric ruler, balance, graduated cylinder, thermometer
3. Use appropriate units for measured or calculated values.
4. Recognize and analyze patterns and trends.
5. Classify objects according to an established scheme and a student-generated scheme.
6. Sequence events.
7. Identify cause-and-effect relationships.

Physical Setting Skills: *quoted from the NYS Core Curriculum (Note: Correlation is provided at the “Investigation” level.)*

1. Given the latitude and longitude of a location, indicate its position on a map and determine the latitude and longitude of a given location on a map.
7. Generate and interpret field maps including topographic and weather maps.
8. Predict the characteristics of an air mass based on the origin of the air mass.
9. Measure weather variables such as wind speed and direction, relative humidity, barometric pressure, etc.
10. Determine the density of liquids, and regular- and irregular-shaped solids.

Major Understandings: *quoted from NYS Performance Indicator (Note: Correlation is provided at the “Lesson” level, i.e., Investigation & Part.)*

Note: PS 1.1e, 1.1h, 1.1i are covered in Investigation 3 but NOT part of NYC Core Curriculum. Remove alignment notation if desired. Remove Major Understandings from this section if alignment notation is removed.)

PS 1.1 Explain daily, monthly, and seasonal changes on Earth.

- 1.1e Most objects in the solar system have a regular and predictable motion. These motions explain such phenomena as a day, a year, phases of the Moon, eclipses, tides, meteor showers and comets.
- 1.1h The apparent motions of the Sun, Moon, planets, and stars across the sky can be explained by Earth’s rotation and revolution. Earth’s rotation causes the length of one day to be approximately 24 hours. This rotation also causes the Sun and Moon to appear to rise in the eastern horizon and to set along the western horizon. Earth’s revolution around the Sun defines the length of the year as 365¼ days.
- 1.1i The tilt of the Earth’s axis of rotation and the revolution of Earth around the Sun cause seasons on Earth. The length of daylight varies depending on latitude and season.

PS 2.1 Explain how the atmosphere (air), hydrosphere (water), and lithosphere (land) interact, evolve, and change.

- 2.1a Nearly all the atmosphere is confined to a thin shell surrounding Earth. The atmosphere is a mixture of gases, including nitrogen and oxygen with small amounts of water vapor, carbon dioxide, and other trace gases. The atmosphere is stratified into layers, each having distinct properties. Nearly all weather occurs in the lowest layer of the atmosphere.
- 2.1c The rock at Earth’s surface forms a nearly continuous shell around Earth called the lithosphere.
- 2.1d The majority of the lithosphere is covered by a relatively thin layer of water called the hydrosphere.
- 2.1j Water circulates through the atmosphere, lithosphere, and hydrosphere in what is known as the water cycle.

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PS 2.2 Describe volcano and earthquake patterns, the rock cycle, and weather and climate changes.

- 2.2i Weather describes the conditions of the atmosphere at a given location for a short period of time.
- 2.2k The uneven heating of Earth's surface is the cause of weather.
- 2.2l Air masses form when air remains nearly stationary over a large section of Earth's surface and takes on the conditions of temperature and humidity of that location. Weather conditions at a location are determined primarily by temperature, humidity and pressure of air masses over that location.
- 2.2m Most local weather condition changes are caused by movement of air masses.
- 2.2n The movement of air masses is determined by prevailing winds and upper air currents.
- 2.2o Fronts are boundaries between air masses. Precipitation is likely to occur at these boundaries.
- 2.2q Hazardous weather conditions include thunderstorms, tornadoes, hurricanes, ice storms, and blizzards. Humans can prepare for and respond to these conditions if given sufficient warning.
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- 2.2r Substances enter the atmosphere naturally and from human activity. Some of these substances include dust from volcanic eruptions and greenhouse gases such as carbon dioxide, methane, and water vapor. These substances can affect weather, climate, and living things.

PS 3.1 Observe and describe properties of materials, such as density, conductivity and solubility.

- 3.1a. Substances have characteristic properties. Some of these properties include color, odor, phase at room temperature, density, solubility, heat and electrical conductivity, hardness, and boiling and freezing points.
- 3.1c The motion of particles helps to explain the phases (states) of matter as well as changes from one phase to another. The phase in which matter exists depends on the attractive forces among its particles.
- 3.1f A solid has a definite shape and volume. Particles resist a change in position.
- 3.1h Density can be described as the amount of matter that is in a given amount of space. If two objects have equal volume, but one has more mass, the one with more mass is denser.

PS 3.2 Distinguish between chemical and physical change.

- 3.2a During a physical change a substance keeps its chemical composition and properties. Examples of physical changes include freezing, melting, condensation, boiling, evaporation, tearing, and crushing.

PS 4.1 Describe the sources and identify the transformations of energy observed in everyday life.

- 4.1a The Sun is a major source of energy for Earth. Other sources of energy include nuclear and geothermal energy.
- 4.1c Most activities in everyday life involve one form of energy being transformed into another. For example, chemical energy in gasoline is transformed into mechanical energy in an automobile engine. Energy, in the form of heat, is almost always one of the products of energy transformations.
- 4.1d Different forms of energy include heat, light, electrical, mechanical, sound, nuclear, and chemical. Energy is transformed in many ways.

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PS 4.2 Observe and describe heating and cooling events.

- 4.2a Heat moves in predictable ways, flowing from warmer objects to cooler ones, until both reach the same temperature.
- 4.2b Heat can be transferred through matter by the collisions of atoms and/or molecules (conduction) or through space (radiation). In a liquid or gas, currents will facilitate the transfer of heat (convection).
- 4.2c During a phase change, heat energy is absorbed or released. Energy is absorbed when a solid changes to a liquid and when a liquid changes to a gas. Energy is released when a gas changes to a liquid and when a liquid changes to a solid.
- 4.2d Most substances expand when heated and contract when cooled. Water is an exception, expanding when changing to ice.

PS 4.4 Observe and describe the properties of sound, light, magnetism, and electricity.

- 4.4a Different forms of electromagnetic energy have different wavelengths. Some examples of electromagnetic energy are microwaves, infrared light, visible light, ultraviolet light, X-rays, and gamma rays.
- 4.4b Light passes through some materials, sometimes refracting in the process. Materials absorb and reflect light, and may transmit light. To see an object, light from that object, emitted by or reflected from it, must enter the eye.

PS4.5 Describe situations that support the principle of conservation of energy.

- 4.5a Energy cannot be created or destroyed, but only changed from one form into another.
- 4.5b Energy can change from one form to another, although in the process some energy is always converted to heat. Some systems transform energy with less loss of heat than others.

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IMPORTANT NOTES

FOSS® Weather & Water Multimedia:

The FOSS® CD-ROM based multimedia component is an integral part of the course. It may be accessed through your browser and Internet connection *or* using the CD-ROM installed on your computer. In either case you will need to use a large screen monitor or LCD projector when making presentations to the entire class.

It is essential that you review the installation requirements (Teacher Guide, CD-ROM User Guide pp. 475 – 506) check system requirements and necessary “plug-in” software, install the CD and review ALL interactive components on the computer that you will be using in the classroom (and have the installation completed on other computers (ex.: computer lab) PRIOR TO PRESENTING THE LESSON. Request local technical support to complete installation if you have problems. Emails for additional technical assistance requests should be sent through the link at the bottom of the FOSSweb Welcome Page (www.fossweb.com/index.php).

The Multimedia is used throughout the course and you will need to be able to switch between the variety of formats (VCR/computer) and decide how your students will best benefit from the different instructional formats (group instruction, computer lab, classroom computers, learning centers, reinforcement though home study).

To illustrate, in Week 1 of Weather & Water the following types of multimedia will be used:

- Video segments showing specific examples of weather are viewed and students review and generate questions about the weather.
- Local Student data that is recorded in Investigation 1 may be transferred to (Excel) spreadsheets to produce graphs of the weather results.
- In Part 2 students contact the National Weather Service (www.crh.noaa.gov/national_clickmap.html).
- In Investigation 2, Part 1 the CD-ROM/Multimedia *Gas in a Syringe* animation is used to show gas under pressure.

As an alternate or in addition to the CD-ROM, you may access the Multimedia via the Internet through the FOSS® website (www.fossweb.com/NYC/modules3-6/grade6.html). At the Weather & Water page click on the *Weather & Water Multimedia* link where you will register for a username and password that will be shared with your students and allow student access from any networked computer. Daily use of the Multimedia through the Internet is a great option if you have a reliable network connection. In other cases using the online Multimedia will be the preferred option for use in the computer lab.

You will need a VCR and monitor to view videos included in this kit (*Wonders of Weather, Water Works: Careers in Hydrology.*)

Homework / Extra Practice for FOSS® Weather & Water:

Homework for the Middle School FOSS® modules can take a variety of forms. Throughout the unit specific homework is assigned as a step in “*Guiding the Investigation.*” The teacher may decide to assign readings for homework as prompted at the end of an investigation to support and extend experiment content. The readings and/or the questions posed after the readings, **reflections in student notebooks** and FOSS® Response Sheets can all be used as homework. Other suggestions for extra practice with challenging concepts are included in the “*Extending the Experience*” section of some investigations.

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IMPORTANT NOTES

Science Materials Supplied by the Teacher/School for FOSS® Weather & Water:

The FOSS® Middle School modules are designed to be used in classrooms where a teacher sees several sections of students working on the same unit of study each day. Typically this takes place in the ‘science lab’ (See Materials section of the Teacher Guide, pp. 27-32.) The kit provides consumable equipment for five classes of 32 students. Teachers using this unit will have consumable materials for 160 student uses. Materials supplied by the teacher (listed on p. 30) include common classroom supplies, perishable materials and science equipment frequently found in the middle school setting. Review this list to determine if you need any additional materials.

The section of this Pacing Guide called “**Science Materials Supplied by the Teacher**” details the equipment, tools, resources and other significant items needed for the daily lesson. It does not include common classroom supplies like paper, pencils, marking pens, staplers, etc.

Time on Task in FOSS® Weather & Water:

- For YEAR ONE of the new Science Curriculum adoption the 6th grade Pacing Calendar has been designed to incorporate **all** parts of the curriculum into the classroom instruction time. Specific comments have been added to note portions of investigations that may be moved out of direct instruction time and used as reinforcement (as homework or at the teacher’s discretion). It is recommended that teachers modulate the use of the variety of instructional experiences to address student learning styles, classroom management and student interest. As noted on p. 26 of the Teacher Guide, the first time user of the FOSS® Weather and Water Course is encouraged to follow the path of the Teacher Guide. In future years, modifications that will enhance student understanding will be well grounded in curriculum objectives and teacher experiences.
- Students new to the FOSS® Middle School modules benefit from the initial use of the Student Resource Book during class time. Spend some time with students examining the format of the Resource Book as it differs from the traditional textbook format with which they are familiar. As you proceed through the course, you will be reminded in the Teacher Guide that you will need to decide whether to assign the reading and questions as homework or devote class time to the reading.
- Investigation 3: Seasons and Sun, Parts 1 – 3 (Lessons 8, 9, 10, 11, 12) address important concepts in the Physical Settings Skills and lay the foundation for understanding of the angle of the sun and how beam spreading reduces the intensity of solar radiation (See TG p. 92 “Why Do I have to Learn This?”). These Investigations also introduce standards (noted in each lesson) that are not cited in the Grade 6 NYC Core Curriculum. These standards are covered at Grade 8. While the lessons 9 thru 12 are not standard specific, seasons, beam spreading and solar radiation introduce important concepts that lead to Investigation 4: Heat Transfer, exploring radiation, differential heating of the Earth’s surface and conduction. If any portion of these investigations are omitted consideration should be given to returning to any portion of Investigation 3 at the end of the FOSS® Weather and Water Course to enhance student understanding of movement of air masses.

End of Unit 2, Mid-Year City Test and Full Kit Option Schools using FOSS® Weather & Water:

- The anticipated calendar year benchmark for the end of Unit 2 is January 15.
- The YEAR ONE ADOPTION benchmark is completion of Investigation 7: *The Water Planet* Lesson 37.
- Full kit option schools should begin Unit 3 by continuing with FOSS® Weather and Water Investigations 8 & 9 to complete the course.

Note that preparation notes for Units 3 & 4: FOSS® Populations and Ecosystems are included in the “Advance Planning/Notes to Teachers” (see Lesson 46)

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WEEK 1	<p>Lesson 1 (45 min) Objective(s): Pre-assessment</p>	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> • General Skills: • Physical Setting Skills: • PS 	
	<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide, Assessment, pp. 417-421, 446-451. – Teacher Guide Overview, pp. 1-26 taking note of <ul style="list-style-type: none"> p. 14 Reading & Writing in Science p. 16 Management Strategies p. 20 Using FOSS Technology p. 21 Classroom Safety p. 22 Weather & Water Course Matrix – Teacher Guide Materials, pp. 27-32 taking note of <ul style="list-style-type: none"> p. 30 Materials Supplied by the Teacher p. 31 Calibrating Weather Tools – Must be done several days before Lesson 3-Investigation 1: What is Weather? Part 2: Local Weather. – Prepare to take outdoor weather tool reading in Lesson 3. 	<p>Investigation/Activity</p> <p>Administer Pretest: Summative Assessment TG pp. 469-474</p>	<p>Science Materials Supplied by the Teacher</p> <p>AV Equipment</p> <p>Determine the Multimedia set-up that best fits your classroom setting. See FOSS® Weather & Water Teacher Guide, page 20.</p>

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	<p>Lesson 2 (45 min) Objective(s): Content</p> <ul style="list-style-type: none"> Weather is the condition of Earth’s atmosphere at a given time in a given place. Severe weather has the potential to cause death and destruction in the environment. Meteorology is the science of weather, and meteorologists are the people who study Earth’s weather. 	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> General Skills: 1, 2, 3 Physical Setting Skills: 9 PS 2.2i, 2.2q 	
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">WEEK 1 (continued)</p>	<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> Teacher Guide Overview, pp. 33-42 taking note of: pp. 34-35 Inv. 1 “At A Glance” p. 41 Finding Weather Information (see also p. 49 Review Weather-Data Resources). Teacher Guide Materials & Getting Ready, pp. 43-44 taking note of p. 43 Step 1. Plan to show VIDEO p. 44 Step 5. Plan for optional readings. Teacher Guide, Assessment, pp. 417-421. Reminder: pp. 31 Calibrating Weather Tools – Must be done several days before Lesson 3-Investigation 1: What is Weather? Part 2: Local Weather. Prepare to take outdoor weather tool reading in Lesson 3. 	<p style="text-align: center;">Investigation/Activity</p> <p>Investigation 1: <i>What is Weather?</i> Part 1: <i>Into the Weather, Steps #1-14</i></p> <ul style="list-style-type: none"> Teacher Guide pp. 45-47 Student Lab Notebook, p. 1 Transparency of Student Lab Notebook p.1 (make 1 for each class) Special Teacher Master p. Video – <i>Wonders of Weather Part 4 – Things That Fall From the Sky Part 2 – Hurricanes</i> Assessment Master, p. 453: Assessment Chart for Investigation 1, Part 1 – Quick Write Assessment Scoring Guide. p. 422 <p><i>FOSS Weather & Water Resource Book: Naming Hurricanes pp. 3-4</i></p> <p>Optional Readings: <i>FOSS Weather & Water Resource Book: Mr. Tornado pp. 67-68</i> <i>Severe Weather pp. 69-76</i></p>	<p style="text-align: center;">Science Materials Supplied by the Teacher</p> <p>AV Equipment</p> <ul style="list-style-type: none"> Extension cord Overhead projector Multimedia set-up for CD-ROM VCR with monitor

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	<p>Lesson 3 (45 min) Objective(s): Process Use weather instruments to measure temperature, atmospheric pressure, humidity, wind direction, and wind speed. Building Explanations Describe weather instruments and the weather factors that they measure.</p>	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> • General Skills: 1, 2, 3 • Physical Setting Skills: 9 • PS 2.2i 	
<p>WEEK 1 (continued)</p>	<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Reminder: pp. 31 Calibrating Weather Tools – <i>Must be done several days before Lesson 3- Investigation 1: What is Weather? Part 2: Local Weather.</i> – Teacher Guide Overview, pp. 33-42 taking note of: pp. 34-35 Inv. 1 “At A Glance” p. 41 Finding Weather Information. – Teacher Guide Materials & Getting Ready, pp. 48-50 taking note of p. 49 Step 1. Review Weather-Data Resources. p. 50 Step 6. Consider Multimedia. – Teacher Guide, Assessment, pp. 417-421. 	<p style="text-align: center;">Investigation/Activity</p> <p>Investigation 1: What is Weather? Part 2: Local Weather, Steps #1-14</p> <ul style="list-style-type: none"> – Teacher Guide pages 51-53 – Student Lab Notebook, p. 1 – Transparency of Student Lab Notebook, p.1 (make 1 for each class) – Special Teacher Master No. 1, p. 355 – Assessment Master, p. 453: Assessment Chart for Investigation 1, Part 2 – Teacher Observation: Use of Weather Measurement Tools. – <i>FOSS Weather & Water Resource Book: Naming Hurricanes</i> pp. 3-4 <p>Extending the Experience: Teacher Guide pages 54-56</p> <p>Consider these enrichment activities AT ANY TIME DURING THE MODULE. These experiences may be suitable for enrichment, homework or for a lesson plan to be delivered by a substitute teacher when a hands-on investigation may not be appropriate.</p>	<p style="text-align: center;">Science Materials Supplied by the Teacher</p> <p>AV Equipment</p> <ul style="list-style-type: none"> • Extension cord • Overhead projector

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WEEK 1 (continued)	<p>Lesson 4 (45 min) Objective(s): Content Air is matter, it occupies space, has mass, and can be compressed. Process</p> <ul style="list-style-type: none"> • Conduct experiments to determine that air has mass. • Use a molecular model to compare a gas at standard pressure and a gas under increased pressure. • Explain how experimental results provide evidence that air has mass. 		<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> • General Skills: 1, 2, 3 • Physical Setting Skills: • PS 3.1a
	<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide Overview, pp. 57-68 taking note of: pp. 58-9 Inv. 2 “At A Glance” p. 41 Finding Weather Information. – Teacher Guide Materials & Getting Ready, pp. 69-70 taking note of p. 70 Step 3. Preview Multimedia p. 70 Step 4. Consider Reading as classwork or homework. – Teacher Guide, Assessment, pp. 417-421. 	<p style="text-align: center;">Investigation/Activity</p> <p>Investigation 2: <i>Where’s the Air?</i> Part 1: <i>The Air Around Us, Steps #1-11</i></p> <ul style="list-style-type: none"> – Teacher Guide pages 71-73 – Student Lab Notebook, p. 3, <i>Air Investigations Teacher Master Answer sheet: pp. 375</i> – CD-ROM/Multimedia: Matter and Energy—Gas in a Syringe – Assessment Master, p. 453: Assessment Chart for Investigation 2, Parts 2.1 – Air Investigations – <i>FOSS Weather & Water Resource Book: What’s in the Air?</i> pp. 6-7. <i>Teacher Master Answer Sheet: p. 376.</i> 	<p style="text-align: center;">Science Materials Supplied by the Teacher</p> <p>Masking tape (2) Metal forks</p> <p>AV Equipment</p> <ul style="list-style-type: none"> • Multimedia set-up for CD-ROM

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<p>Lesson 5 (45 min)</p> <p>Objective(s):</p> <p>Content Air is matter, it occupies space, has mass, and can be compressed.</p> <p>Process</p> <ul style="list-style-type: none"> • Conduct experiments to determine that air has mass. • Use a molecular model to compare a gas at standard pressure and a gas under increased pressure. • Explain how experimental results provide evidence that air has mass. 	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> • General Skills: 1, 2, 3 • Physical Setting Skills: • PS 3.1a 	
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide Overview, pp. 57-68 taking note of: pp. 58-9 Inv. 2 “At A Glance” p. 68 “Why Do I Have to Learn This?” – Teacher Guide Materials & Getting Ready, pp. 69-70 taking note of p. 70 Step 3. Preview Multimedia p. 70 Step 4. Consider Reading (after Lesson 6) as classwork or homework. – Teacher Guide, Assessment, pp. 417-421. – <i>Prepare the Atmosphere posters for Part 2.</i> 	<p>Investigation/Activity</p> <p>Investigation 2: <i>Where’s the Air?</i> Part 1: <i>The Air Around Us, Steps #12-24</i></p> <ul style="list-style-type: none"> – Teacher Guide pages 73-75 – Student Lab Notebook, p. 3, <i>Air Investigations Teacher Master Answer Sheet: pp. 375</i> – Assessment Master, p. 453: Assessment Chart for Investigation 2, Parts 2.1 – Air Investigations – <i>FOSS Weather & Water Resource Book: What’s in the Air?</i> p. 6-7 <i>Teacher Master Answer Sheet: p. 376</i> 	<p>Science Materials Supplied by the Teacher</p> <p>Masking tape (2) Metal forks</p> <p>AV Equipment</p>

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	<p>Lesson 6 (45 min) Objective(s): Content</p> <ul style="list-style-type: none"> • The atmosphere is the layers of gases surrounding Earth. • Weather happens in the troposphere, the layer of the atmosphere closest to Earth’s surface. • The troposphere is a mixture of nitrogen (78%), oxygen (21%), and other gases (1%), including water vapor. 	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> • General Skills: 1, 2, 3 • Physical Setting Skills: • PS 	
<p>WEEK 2</p>	<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide Overview, pp. 57-68 taking note of: pp. 58-9 Inv. 2 “At A Glance” p. 68 “Why Do I Have to Learn This?” – Teacher Guide Materials & Getting Ready, pp. 76-77 taking note of p. 77 Step 1. Preview the Atmosphere Posters p. 77 Step 2. Preview Multimedia p. 77 Step 3. Consider Reading (after Lesson 6) as classwork or homework. – Teacher Guide, Assessment, pp. 417-421. 	<p style="text-align: center;">Investigation/Activity</p> <p>Investigation 2: <i>Where’s the Air?</i> Part 2: <i>Earth’s Atmosphere, Steps #1-10</i></p> <ul style="list-style-type: none"> – Teacher Guide pages 78-80 – Student Lab Notebook, p. 5, <i>Earth’s Atmosphere Questions Teacher Master Answer Sheet: pp. 377</i> – Transparency No. 1 – Earth’s Atmosphere Questions – CD-ROM/Multimedia: Atmospheric Data→Elevator to Space – Assessment Master, p.453: Assessment Chart for Investigation 2, Part 2.2 – Earth’s Atmosphere – <i>FOSS Weather & Water Resource Book: A Thin Blue Veil</i> p. 8-11 <i>Teacher Master Answer Sheet: pp. 378</i> 	<p style="text-align: center;">Science Materials Supplied by the Teacher</p> <p>AV Equipment</p> <ul style="list-style-type: none"> • Overhead projector • Multimedia set-up for CD-ROM

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<p>Lesson 7 (45 min) Objective(s): Content</p> <ul style="list-style-type: none"> • The atmosphere is the layers of gases surrounding Earth. • Weather happens in the troposphere, the layer of the atmosphere closest to Earth’s surface. • The troposphere is a mixture of nitrogen (78%), oxygen (21%), and other gases (1%), including water vapor. 	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> • General Skills: 1, 2, 3 • Physical Setting Skills: • PS 2.1a 	
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide Overview, pp. 57-68 taking note of: pp. 58-9 Inv. 2 “At A Glance” p. 68 “Why Do I Have to Learn This?” – Teacher Guide Materials & Getting Ready, pp. 76-77 taking note of p. 77 Step 4 & 5. Plan Assessment p. 81 Extending the Experience – Teacher Guide, Assessment, pp. 417-421. 	<p>Investigation/Activity</p> <p>Investigation 2: Where’s the Air? Part 2: Earth’s Atmosphere, Steps #11-12</p> <ul style="list-style-type: none"> – Teacher Guide pages 80 – Student Lab Notebook, p. 5, <i>Earth’s Atmosphere Questions Teacher Master Answer Sheet: pp. 377</i> – Transparency No. 1 – Earth’s Atmosphere Questions – Assessment Master, p.453: Assessment Chart for Investigation 2, Part 2.2 – Earth’s Atmosphere – Mid-summative Exam 1-2, pages 458-459 Assessment Scoring Guide, pages 423-424 <p>Extending the Experience: Teacher Guide pages 81-82</p> <ul style="list-style-type: none"> – Consider these enrichment activities ESPECIALLY #1 – Weigh the Air in a Soccer Ball to reinforce the air mass question investigated in Part 1. 	<p>Science Materials Supplied by the Teacher</p> <p>AV Equipment</p> <ul style="list-style-type: none"> • Overhead projector

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<p>Lesson 8 (45 min) Objective(s): Process Graph monthly day-length data for a single location to look for a pattern.</p>	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> • General Skills: 1, 3, 4, 7, 8 • Physical Setting Skills: 1 (see Investigation/Activity Note) • PS 2.1c (see Investigation/Activity Note) 	
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide Overview, pp. 83-92 taking note of: pp. 84-85 Inv. 3 “At A Glance” pp. 92 “Why Do I Have to Learn This?” – Teacher Guide Materials & Getting Ready, pp. 93-94 taking note of p. 94 Step 1. Acquire Sunrise/Sunset Data for Your Location. p. 94 Step 2. Consider Reading as classwork or homework. – Teacher Guide, Assessment, pp. 417-421 	<p>Investigation/Activity</p> <p>Investigation 3: <i>Seasons and Sun</i> Part 1: <i>How Much Sunshine? Steps #1-9</i></p> <ul style="list-style-type: none"> – Teacher Guide pages 95-96 – Student Lab Notebook, p. 7, <i>Sunrise/Sunset Times for 2000 Teacher Answer Master Sheet: pp. 379</i> – Transparency No. 2 – Sunrise/Sunset Times for 2000 – Assessment Master, p.454: Assessment Chart for Investigation 3, Part 3.1, Seasons & Graphing – Self-Assessment: Quick Write Assessment Scoring Guide, Quick Write, page 425 – <i>FOSS Weather & Water Resource Book: Wendy and her Worldwide Weather Watchers. pp. 12-16 Teacher Master Answer Sheet: p. 380</i> <p>Note:</p> <ul style="list-style-type: none"> – <i>Using a world map or globe, locate cities from the above reading to meet Physical Setting Skills No. 1.</i> – <i>Introduce the term “lithosphere” to meet PS 2.1c</i> 	<p>Science Materials Supplied by the Teacher</p> <p>AV Equipment</p> <ul style="list-style-type: none"> • Overhead projector

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WEEK 2 (continued)	<p>Lesson 9 (45 min) (see: “Time on Task in FOSS® Weather & Water”) Objective(s): Content Earth’s axis of rotation tilts at an angle of 23.5° and always points at the North Star. Process</p> <ul style="list-style-type: none"> • Use an Earth globe and light bulb to model daily and seasonal variations in day length. • Explain how the tilt of the Earth’s axis and Earth’s revolution around the Sun produce seasons. • Discuss seasonal variation in day length as a consequence of axis tilt, rotation, and revolution. 		<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> • General Skills: 1, 3, 4, 7, 8 • Physical Setting Skills:
	<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide Overview, pp. 83-92 taking note of: pp. 84-85 Inv. 3 “At A Glance” p. 92 “Why Do I Have to Learn This?” – Teacher Guide Materials & Getting Ready, pp. 97-98 taking note of p. 98 Step 1. Acquire Globes. p. 98 Step 2. Plan Light Source. p. 98 Step 3. Preview Multimedia. – Teacher Guide, Assessment, pp. 417-421. 	<p style="text-align: center;">Investigation/Activity</p> <p>Investigation 3: <i>Seasons and Sun</i> Part 2: <i>Sun Earth System Steps #1-14</i></p> <ul style="list-style-type: none"> – Teacher Guide pages 99-102 – Student Lab Notebook, p. 9, <i>Seasonal Changes Teacher Master Answer Sheet: pp. 381-382</i> – Transparency No. 3 – Day Length Questions – Transparency No. 4 – Sun-Earth System – Assessment Master, p.454: Assessment Chart for Investigation 3, Part 2 – <i>FOSS Weather & Water Resource Book: Seasons</i> p. 17-19 	<p style="text-align: center;">Science Materials Supplied by the Teacher</p> <p>Globe(s) Lamp with bare bulb Colorful sticky dots</p> <p>AV Equipment</p> <ul style="list-style-type: none"> • Overhead projector

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<p>Lesson 10 (45 min) (see: “Time on Task in FOSS® Weather & Water”)</p> <p>Objective(s):</p> <p>Content Earth’s axis of rotation tilts at an angle of 23.5° and always points at the North Star.</p> <p>Process</p> <ul style="list-style-type: none"> • Use an Earth globe and light bulb to model daily and seasonal variations in day length. • Explain how the tilt of the Earth’s axis and Earth’s revolution around the Sun produce seasons. • Discuss seasonal variation in day length as a consequence of axis tilt, rotation, and revolution. 	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> • General Skills: 1, 3, 4, 7, 8 • Physical Setting Skills: 	
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide Overview, pp. 83-92 taking note of: pp. 84-85 Inv. 3 “At A Glance” pp. 92 “Why Do I Have to Learn This?” – Teacher Guide Materials & Getting Ready, pp. 97-98 taking note of p. 98 Step 3. Preview Multimedia. – Teacher Guide, Assessment, pp. 417-421. 	<p>Investigation/Activity</p> <p>Investigation 3: <i>Seasons and Sun</i> Part 2: <i>Sun Earth System Steps #15-16</i></p> <ul style="list-style-type: none"> – Teacher Guide page 102 – Student Lab Notebook, p. 9, <i>Seasonal Changes Teacher Answer Master Sheet: pp. 381-382</i> – Student Lab Notebook, p. 11, <i>Response Sheet – Seasons and Sun Teacher Answer Master Sheet: p. 383</i> – CD-ROM/Multimedia→Seasons – Assessment Master, p. 454: Assessment Chart for Investigation 3, Part 3.3, Assessment Scoring Guide, pages 425-426 	<p>Science Materials Supplied by the Teacher</p> <p>Globe(s) Lamp with bare bulb Colorful sticky dots</p> <p>AV Equipment</p> <ul style="list-style-type: none"> • Overhead projector • Multimedia set-up for CD-ROM

Grade 6

<p>Lesson 11 (45 min) (see: “Time on Task in FOSS® Weather & Water”)</p> <p>Objective(s):</p> <p>Content</p> <ul style="list-style-type: none"> • The angle at which light from the Sun strikes the surface of Earth is the solar angle. • Beam spreading is the increase in the area covered by a beam of light as the solar angle decreases. <p>Process</p> <ul style="list-style-type: none"> • Use light sources and surfaces to model beam spreading. • Explain how beam spreading reduces the intensity of solar radiation. 	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> • General Skills: 1, 3, 4, 7, 8 • Physical Setting Skills: 	
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide Overview, pp. 83-92 taking note of: pp. 84-85 Inv. 3 “At A Glance” pp. 92 “Why Do I Have to Learn This?” – Teacher Guide Materials & Getting Ready, pp. 103-105 taking note of p. 104 Step 1. Prepare for Beam-Spreading Demonstration. – Teacher Guide, Assessment, pp. 417-421. 	<p>Investigation/Activity</p> <p>Investigation 3: <i>Seasons and Sun</i> Part 3: <i>Sun Angle and Solar Heating Steps #1-13</i></p> <ul style="list-style-type: none"> – Teacher Guide page 106-110 – Student Lab Notebook, p. 13, <i>Beam Spreading Teacher Answer Master Sheet: pp. 384</i> – Transparency No. 5 – Solar Angle – Transparency No. 6 – Solar Angle on Earth – Transparency No. 7 – Sunlight on Earth’s Surface – Assessment Master, p. 454: Assessment Chart for Investigation 3, Part 3.3 Self-Assessment: Quick Write and Response Sheet Assessment Scoring Guide, pages 425-426 – Mid-summative Exam 3, page 460 Assessment Scoring Guide, pages 427 	<p>Science Materials Supplied by the Teacher</p> <p>Flashlight Meterstick Rubber bands/Masking tape Globe on a stand</p> <p>AV Equipment</p> <ul style="list-style-type: none"> • Overhead projector

Grade 6

<p>Lesson 12 (45 min) (see: “Time on Task in FOSS® Weather & Water”)</p> <p>Objective(s):</p> <p>Content</p> <ul style="list-style-type: none"> • The angle at which light from the Sun strikes the surface of Earth is the solar angle. • Beam spreading is the increase in the area covered by a beam of light as the solar angle decreases. <p>Process</p> <ul style="list-style-type: none"> • Use light sources and surfaces to model beam spreading. • Explain how beam spreading reduces the intensity of solar radiation. 	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> • General Skills: 1, 3, 4, 7, 8 • Physical Setting Skills: 	
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide Overview, pp. 83-92 taking note of: pp. 84-85 Inv. 3 “At A Glance” pp. 92 “Why Do I Have to Learn This?” – Teacher Guide Materials & Getting Ready, pp. 103-105 taking note of p. 105 Step 3. Plan for Self-Assessment – Teacher Guide, Assessment, pp. 417-421 	<p>Investigation/Activity</p> <p>Investigation 3: <i>Seasons and Sun</i> Part 3: <i>Sun Angle and Solar Heating Step #14</i></p> <ul style="list-style-type: none"> – Teacher Guide page 110 – Student Lab Notebook, p. 13, <i>Beam Spreading Teacher Answer Master Sheet: pp. 384</i> – Assessment Master, p. 454: Assessment Chart for Investigation 3, Part 3.3 Self-Assessment: Quick Write and Response Sheet Assessment Scoring Guide, pages 425-426 – Mid-summative Exam 3, page 460 Assessment Scoring Guide, pages 427 <p>Extending the Experience: Teacher Guide pages 111-112 Consider these enrichment activities ESPECIALLY #2 – Compare Cities, and #4 – Investigate Day Length and Sunsets on CD-ROM</p>	<p>Science Materials Supplied by the Teacher</p> <p>AV Equipment</p> <ul style="list-style-type: none"> • Overhead projector • Multi-media set-up for CD-ROM

Grade 6

<p>Lesson 13 (45 min)</p> <p>Objective(s):</p> <p>Content</p> <ul style="list-style-type: none"> • The Sun is the major source of energy that heats the atmosphere. • Heat is kinetic energy of atoms and molecules. • Energy moves from one material to another by radiation and conduction. • Thermometers measure the temperature of materials. <p>Process</p> <ul style="list-style-type: none"> • Use thermometers to measure the temperature of materials. • Measure the heating and cooling of earth materials when moved into and out of sunshine. • Explain how radiant energy from the Sun heats solid and liquid materials. 	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> • General Skills: 1, 2, 3, 4, 7, 8 • Physical Setting Skills: 9 • PS 4.1a, 4.1c, 4.1d, 4.2a, 4.2b 	
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide Overview, pp. 113-120 taking note of: pp. 114-115 Inv. 4 “At A Glance” p. 120 “Why Do I Have to Learn This?” – Teacher Guide Materials & Getting Ready, pp. 121-124 taking note of p.122 Step 2. Plan for a Weather-Report Transparency. p. 122 Step 4. Practice Setting Up the Experiment. p. 123 Step 7. Plan for Cloudy Days. p. 124 Step 8. Preview Multimedia. – Teacher Guide, Assessment, pp. 417-421. 	<p>Investigation/Activity</p> <p>Investigation 4: <i>Heat Transfer</i> Part 3: <i>Heating the Earth, Steps #1-7</i></p> <ul style="list-style-type: none"> – Teacher Guide pages 125-126 – Student Lab Notebook, p. 14, <i>Earth-Materials Temperatures Chart</i> – Student Lab Notebook, p. 15, <i>Earth-Materials Temperatures Graph</i> – Transparency No. 8 – Setting Up Earth Materials – Transparency No. 9 – Earth-Materials Temperatures Chart – Transparency No. 10 – Earth-Materials Temperatures Graph – Transparency No. 11 – Earth-Materials Temperatures Questions – Assessment Master, p. 454: Assessment Chart for Investigation 4, Part 4.1: Graphing 	<p>Science Materials Supplied by the Teacher</p> <p>Newspaper Watch or Stopwatch Water Pitcher (2) Shallow Basins</p> <p>Optional: see pp. 123 1-4 Infrared Heat Lamps (250 Watt) 1-4 Lamp fixtures with ceramic sockets</p> <p>AV Equipment</p> <ul style="list-style-type: none"> • Overhead projector

Grade 6

<p>Lesson 14 (45 min)</p> <p>Objective(s):</p> <p>Content</p> <ul style="list-style-type: none"> • The Sun is the major source of energy that heats the atmosphere. • Heat is kinetic energy of atoms and molecules. • Energy moves from one material to another by radiation and conduction. • Thermometers measure the temperatures of materials. <p>Process</p> <ul style="list-style-type: none"> • Use thermometers to measure the temperatures of materials. • Measure the heating and cooling of earth materials when moved into and out of sunshine. • Explain how radiant energy from the Sun heats solid and liquid materials. 		<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> • General Skills: 1, 2, 3, 4, 7, 8 • Physical Setting Skills: 9 • PS 4.1a, 4.1c, 4.1d, 4.2a, 4.2b
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide Overview, pp. 113-120 taking note of: pp. 114-115 Inv. 4 “At A Glance” p. 120 “Why Do I Have to Learn This?” – Teacher Guide Materials & Getting Ready, pp. 121-124, and Conducting The Investigation, pp. 127-128 taking note of pp. 122 Step 4. Practice Setting Up the Experiment. pp. 123 Step 7. Plan for Cloudy Days. pp. 124 Step 8. Preview Multimedia. pp.127 Step 11 & 12 Graphing. – Teacher Guide, Assessment, pp. 417-421. 	<p>Investigation/Activity</p> <p>Investigation 4: <i>Heat Transfer</i> Part 1: <i>Heating the Earth, Steps #8-19</i></p> <ul style="list-style-type: none"> – Teacher Guide pages 127-130 – Student Lab Notebook, p. 14, <i>Earth-Materials Temperatures Chart</i> – Student Lab Notebook, p. 15, <i>Earth-Materials Temperatures Graph</i> – Transparency No. 8 – Setting Up Earth Materials – Transparency No. 9 – Earth-Materials Temperatures Chart – Transparency No. 10 – Earth-Materials Temperatures Graph – Transparency No. 11 – Earth-Materials Temperatures Questions – CD-ROM/Multimedia: Matter and Energy→Heat & Energy: <i>Radiation</i> – Assessment Master, p. 454: Assessment Chart for Investigation 4, Part 4.1: Graphing – <i>FOSS Weather & Water Resource Book: Thermometer: A Device to Measure Temperature.</i> p. 20-21 	<p>Science Materials Supplied by the Teacher</p> <p>AV Equipment</p> <ul style="list-style-type: none"> • Overhead projector • Multimedia set-up for CD-ROM

Grade 6

<p>Lesson 15 (45 min) Objective(s): Content</p> <ul style="list-style-type: none"> Heat is kinetic energy of atoms and molecules. Energy moves from one material to another by conduction. <p>Process</p> <ul style="list-style-type: none"> Design and conduct experiments to observe heat transfer by conduction through solids and liquids. Describe heat transfer through multiple materials in terms of molecular activity. Describe how the atmosphere is heated. 	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> General Skills: 1, 2, 3, 4, 7, 8 Physical Setting Skills: 9 PS 4.1d, 4.2a, 4.2b, 4.2c 		
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> Teacher Guide Overview, pp. 113-120 taking note of: pp. 114-115 Inv. 4 “At A Glance” p. 120 “Why Do I Have to Learn This?” Teacher Guide Materials & Getting Ready, pp. 131-132 taking note of p. 132 Step 2. Consider Hot and Cold Water. p. 132 Step 3. Prepare Hot “Salt Water.” p. 132 Step 4. Preview Multimedia. Teacher Guide, Assessment, pp. 417-421. 	<p>Investigation/Activity</p> <p>Investigation 4: <i>Heat Transfer</i> Part 2: <i>Conduction, Steps #1-13</i></p> <ul style="list-style-type: none"> Teacher Guide pages 133-136 Student Lab Notebook, p. 17, <i>Heat Conduction Teacher Answer Master Sheet: pp. 385</i> Transparency No. 12 – Hot-Water Inquiry Transparency No. 13 – Hot-Water Setup CD-ROM/Multimedia: Matter and Energy→Molecules in Solids, Liquids, and Gases Matter and Energy→Heat and Energy, <i>Conduction</i> Assessment Master, p. 454: Assessment Chart for Investigation 4, Part 4.2: Heat Conduction Student Sheet <i>Teacher Answer Master Sheet: pp. 385</i> 	<p>Science Materials Supplied by the Teacher</p> <p>Hot “salt” water Hot water Cold water Tape Paper towels</p> <p>AV Equipment</p> <ul style="list-style-type: none"> Overhead projector Multimedia set-up for CD-ROM 	

Grade 6

<p>Lesson 16 (45 min)</p> <p>Objective(s):</p> <p>Content</p> <ul style="list-style-type: none"> Heat is kinetic energy of atoms and molecules. Energy moves from one material to another by conduction. <p>Process</p> <ul style="list-style-type: none"> Design and conduct experiments to observe heat transfer by conduction through solids and liquids. Describe heat transfer through multiple materials in terms of molecular activity. Describe how the atmosphere is heated. 	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> General Skills: 1, 2, 3, 4, 7, 8 Physical Setting Skills: 9 PS 4.1d, 4.2a, 4.2b, 4.2c 	
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> Teacher Guide Overview, pp. 113-120 taking note of: pp. 114-115 Inv. 4 “At A Glance” p. 120 “Why Do I Have to Learn This?” Teacher Guide Materials & Getting Ready, pp. 131-132 taking note of p. 132 Step 2. Consider Hot and Cold Water. p. 132 Step 3. Prepare Hot “Salt Water.” p. 132 Step 4. Preview Multimedia. p. 132 Step 7. Plan Mid-Summative Assessment. Teacher Guide, Assessment, pp. 417-421. 	<p>Investigation/Activity</p> <p>Investigation 4: <i>Heat Transfer</i> Part 2: <i>Conduction, Steps #14-25</i></p> <ul style="list-style-type: none"> Teacher Guide pages 136-139 Student Lab Notebook, p. 19, <i>Conduction Through Materials</i> Teacher Answer Master Sheet: pp. 386 Transparency No. 14 – Conduction Through Materials CD-ROM/Multimedia: Matter and Energy→Thermometer Animation Video Resources→Conduction Through Metals Assessment Master, p. 454: <i>FOSS Weather & Water Resource Book: Heating the Atmosphere</i> p. 22-26 <i>Teacher Master Answer Sheet: pp. 387</i> 	<p>Science Materials Supplied by the Teacher</p> <p>Hot “salt” water Hot water Cold water Tape Paper towels</p> <p>AV Equipment</p> <ul style="list-style-type: none"> Overhead projector Multimedia set-up for CD-ROM

Grade 6

<p>Lesson 17 (45 min)</p> <p>Objective(s):</p> <p>Content</p> <ul style="list-style-type: none"> Heat is kinetic energy of atoms and molecules. Energy moves from one material to another by conduction. <p>Process</p> <ul style="list-style-type: none"> Design and conduct experiments to observe heat transfer by conduction through solids and liquids. Describe heat transfer through multiple materials in terms of molecular activity. Describe how the atmosphere is heated. 	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> General Skills: 1, 2, 3, 4, 7, 8 Physical Setting Skills: 9 PS 4.1d, 4.2a, 4.2b, 4.2c <p><i>PS 4.4a, 4.4b (see Investigation/Activity Note)</i></p>	
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> Teacher Guide Overview, pp. 113-120 taking note of: pp. 114-115 Inv. 4 “At A Glance” p. 120 “Why Do I Have to Learn This?” Teacher Guide Materials & Getting Ready, pp. 131-132 taking note of p. 132 Step 7. Plan Mid-Summative Assessment. Teacher Guide, Assessment, pp. 417-421. 	<p>Investigation/Activity</p> <p>Investigation 4: <i>Heat Transfer</i> Part 2: <i>Conduction, Steps #26-27</i></p> <ul style="list-style-type: none"> Teacher Guide pages 139 Assessment Master, p. 454: Assessment Chart for Investigation 4, Mid-summative Exam 4 Mid-summative exam 4, page 461-462 Assessment Scoring Guide, pages 428-429 <i>FOSS Weather & Water Resource Book: Heating the Atmosphere</i> p. 22-26 <i>Teacher Answer Master Sheet: pp. 387</i> <p>Extending the Experience: Teacher Guide pages 140</p> <ul style="list-style-type: none"> Consider these enrichment activities ESPECIALLY #2 – Heat Capacity Simulation on CD-ROM <p><i>Note: PS 4.4a and 4.4b may be explored at this time (see Teacher Guide pp. 116-119 for content support) OR these concepts can be deferred to the end of the unit see: Investigation 9: Weather and Climate Part 4: Global Warming</i></p>	<p>Science Materials Supplied by the Teacher</p> <p>AV Equipment</p> <ul style="list-style-type: none"> Overhead projector Multimedia set-up for CD-ROM

Grade 6

<p>Lesson 18 (45 min)</p> <p>Objective(s):</p> <p>Content</p> <ul style="list-style-type: none"> Density is the ratio of a mass to its volume. If two solutions have equal volumes but differ in mass, the one with the greater mass is denser. <p>Process</p> <ul style="list-style-type: none"> Layer salt solutions to determine their relative density. Use mass and volume data to calculate densities (g/cc). Explain density as a ratio between a mass and its volume. 	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> General Skills: 1, 2, 3, 4, 7, 8 Physical Setting Skills: 10 PS 3.1a, 3.1h 	
<p>Advanced Planning/Notes to Teachers</p> <p>–Teacher Guide Overview, pp. 141-151 taking note of: pp. 142-143 Inv. 5 “At A Glance” pp. 151 “Why Do I Have to Learn This?”</p> <p>– Teacher Guide Materials & Getting Ready, pp. 152-155 taking note of pp. 153 Steps 1-4. Solution Preparation. pp. 154 Step 5-6. Demonstration and Props. pp. 154 Step 7. Obtain an Accurate Balance. pp. 155 Step 8-10. Calculating Density.</p> <p>– Teacher Guide, Assessment, pp. 417-421.</p>	<p>Investigation/Activity</p> <p>Investigation 5: <i>Convection</i> Part 1: <i>Density of Fluids, Steps #1-8</i></p> <ul style="list-style-type: none"> – Teacher Guide pages 156-157 – Student Lab Notebook, p. 21, <i>Liquid Layers Teacher Answer Master Sheet: pp. 388</i> – Assessment Master, p. 455: Assessment Chart for Investigation 5 	<p>Science Materials Supplied by the Teacher</p> <p>(2) ½ liter plastic bottles (4) 2 liter plastic bottles Mineral Oil (250 ml) Lamp oil (blue) (250 ml) (<i>may be difficult to buy locally due to fire codes — easily obtained via online ordering via camping or specialty sites</i>) Balance (accurate 0.1g or electronic) Calculators</p>

Grade 6

<p>Lesson 19 (45 min)</p> <p>Objective(s):</p> <p>Content</p> <ul style="list-style-type: none"> Density is the ratio of a mass to its volume. If two solutions have equal volumes but differ in mass, the one with the greater mass is denser. <p>Process</p> <ul style="list-style-type: none"> Layer salt solutions to determine their relative density. Use mass and volume data to calculate densities (g/cc). Explain density as a ratio between a mass and its volume. 	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> General Skills: 1, 3, 4, 7, 8 Physical Setting Skills: 10 PS 3.1a, 3.1h 	
<p>Advanced Planning/Notes to Teachers</p> <p>–Teacher Guide Overview, pp. 141-151 taking note of: pp. 142-143 Inv. 5 “At A Glance” p. 151 “Why Do I Have to Learn This?”</p> <p>– Teacher Guide Materials & Getting Ready, pp. 152-155 taking note of p. 153 Steps 1-4. Solution Preparation. p. 154 Step 5-6. Demonstration and Props. p. 154 Step 7. Obtain an Accurate Balance. p. 155 Step 8-10. Calculating Density.</p> <p>– Teacher Guide, Assessment, pp. 417-421.</p>	<p>Investigation/Activity</p> <p>Investigation 5: <i>Convection</i> Part 1: <i>Density of Fluids, Steps #1-8</i></p> <ul style="list-style-type: none"> – Teacher Guide pages 156-157 – Student Lab Notebook, p. 21, <i>Liquid Layers Teacher Answer Master Sheet: pp. 388</i> – Assessment Master, p. 455: Assessment Chart for Investigation 5 	<p>Science Materials Supplied by the Teacher</p> <p>(2) ½ liter plastic bottles (4) 2 liter plastic bottles Mineral Oil (250 ml) Lamp oil (blue) (250 ml) Balance (accurate 0.1g or electronic) Colored pencils Calculators</p> <p>AV Equipment</p> <ul style="list-style-type: none"> Overhead projector

Grade 6

<p>Lesson 20 (45 min)</p> <p>Objective(s):</p> <p>Content</p> <ul style="list-style-type: none"> Density is the ratio of a mass to its volume. If two solutions have equal volumes but differ in mass, the one with the greater mass is denser. <p>Process</p> <ul style="list-style-type: none"> Layer salt solutions to determine their relative density. Use mass and volume data to calculate densities (g/cc). Explain density as a ratio between a mass and its volume. 	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> General Skills: 1, 3, 4, 7, 8 Physical Setting Skills: 10 PS 3.1a, 3.1h 	
<p>Advanced Planning/Notes to Teachers</p> <ul style="list-style-type: none"> Teacher Guide Overview, pp. 141-151 taking note of: pp. 142-143 Inv. 5 “At A Glance” p. 151 “Why Do I Have to Learn This?” Teacher Guide Materials & Getting Ready, pp. 152-155 taking note of p. 154 Step 5. Demonstration Bottles. p. 155 Steps 8-10. Calculating Density. Teacher Guide, Assessment, pp. 417-421. 	<p>Investigation/Activity</p> <p>Investigation 5: <i>Convection</i> Part 1: <i>Density of Fluids, Steps #19-24</i></p> <ul style="list-style-type: none"> Teacher Guide pages 160-162 Student Lab Notebook, p. 23, <i>Calculating Density</i> <i>Teacher Answer Master Sheet: pp. 389</i> Student Lab Notebook, p. 25, <i>Response Sheet – Convection</i> <i>Teacher Answer Master Sheet: p.390</i> Assessment Master, p. 455: Assessment Chart for Investigation 5, Part 5.1 Assessment Scoring Guide, pages 430-431 <i>FOSS Weather & Water Resource Book: Density</i> p. 27-31 <i>Teacher Master Answer Sheet: pp. 391</i> 	<p>Science Materials Supplied by the Teacher</p> <p>(2) ½ liter plastic bottles (4) 2-liter plastic bottles Mineral Oil (250 ml) Lamp oil (blue) (250 ml) Balance (accurate 0.1g or electronic) Calculators</p> <p>AV Equipment</p> <ul style="list-style-type: none"> Overhead projector

Grade 6

<p>Lesson 21 (45 min)</p> <p>Objective(s):</p> <p>Content</p> <ul style="list-style-type: none"> As matter heats up, it expands, causing the matter to become less dense. Convection is the circulation of fluid (liquid or gas) that results from energy transfer; warm masses rise and cool masses sink. <p>Process</p> <ul style="list-style-type: none"> Describe how materials of different densities interact. Observe convection in a liquid environment. Explain how energy transfer drives the process of convection. 	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> General Skills: 1, 3, 4, 7, 8 Physical Setting Skills: 10 PS 3.1a, 3.1h, 3.1c, 3.1h, 3.2a, 4.2a, 4.2b, 4.2d 	
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> Teacher Guide Overview, pp. 141-151 taking note of: pp. 142-143 Inv. 5 “At A Glance” p. 151 “Why Do I Have to Learn This?” Teacher Guide Materials & Getting Ready, pp. 163-164 taking note of p. 164 Step 1. Plan for Water – Room Temperature, Ice Water and Hot Water. p. 155 Steps 8-10. Calculating Density. Teacher Guide, Assessment, pp. 417-421. 	<p>Investigation/Activity</p> <p>Investigation 5: <i>Convection</i> Part 2: <i>Convection in Water, Steps #1-17</i></p> <ul style="list-style-type: none"> Teacher Guide pages 165-168 Student Lab Notebook, p. 27, <i>Layering Hot and Cold Water Teacher Answer Master Sheet: pp. 392</i> Assessment Master, p. 455: Assessment Chart for Investigation 5, Part 5.2 Layering Hot and Cold Water Student Sheet <i>Teacher Answer Master Sheet: pp. 392</i> <i>FOSS Weather & Water Resource Book: Convection</i> p. 32-33 	<p>Science Materials Supplied by the Teacher</p> <ul style="list-style-type: none"> (1) 2-liter soda bottle (2) Pitchers water Ice <p>AV Equipment</p>

Grade 6

<p>Lesson 22 (45 min)</p> <p>Objective(s):</p> <p>Content Convection is the circulation of fluid (liquid or gas) that results from energy transfer; warm masses rise and cool masses sink.</p> <p>Process</p> <ul style="list-style-type: none"> • Observe convection in a gas environment. • Describe how materials of different densities interact. • Explain how energy transfer drives the process of convection. 	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> • General Skills: 1, 3, 4, 7, 8 • Physical Setting Skills: 10 • PS 4.2a, 4.2b, 4.2c, 4.2d, 4.5a, 4.5b 	
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide Overview, pp. 141-151 taking note of: pp. 142-143 Inv. 5 “At A Glance” p. 151 “Why Do I Have to Learn This?” – Teacher Guide Materials & Getting Ready, pp. 163-164 taking note of p. 170 Step 1. Get Ice. p. 170 Step 3. Practice with a Convection Chamber; see <u>Video Resources: Convection Chamber.</u> – Teacher Guide, Assessment, pp. 417-421. 	<p>Investigation/Activity</p> <p>Investigation 5: <i>Convection</i> Part 3: <i>Convection in Air, Steps #1-10</i></p> <ul style="list-style-type: none"> – Teacher Guide pages 172-174 – Student Lab Notebook, p. 29, <i>Convection Chamber Teacher Answer Master Sheet: pp. 393</i> – CD-ROM/Multimedia: Matter and Energy→Heat and Energy, <i>Convection</i> – Assessment Master, p. 455: Assessment Chart for Investigation 5, Part 5.3 Convection Chamber Student Sheet <i>Teacher Answer Master Sheet: pp. 393</i> 	<p>Science Materials Supplied by the Teacher</p> <p>(2) Incense platform Matches (2) Flashlights Ice Cubes (1) Small plastic bag</p> <p>AV Equipment</p> <ul style="list-style-type: none"> • Multimedia set-up for CD-ROM

Grade 6

<p>Lesson 23 (45 min)</p> <p>Objective(s):</p> <p>Content Convection is the circulation of fluid (liquid or gas) that results from energy transfer; warm masses rise and cool masses sink.</p> <p>Process</p> <ul style="list-style-type: none"> • Observe convection in a gas environment. • Describe how materials of different densities interact. • Explain how energy transfer drives the process of convection. 	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> • General Skills: 1, 3, 4, 7, 8 • Physical Setting Skills: 10 • PS 4.2a, 4.2b, 4.2c, 4.2d, 4.5a, 4.5b (3.1f – see Investigation/Activity Note) 	
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide Overview, pp. 141-151 taking note of: pp. 142-143 Inv. 5 “At A Glance” pp. 151 “Why Do I Have to Learn This?” – Teacher Guide Materials & Getting Ready, pp. 163-164 taking note of pp. 170 Step 3. <i>Practice with a Convection Chamber; see Video Resources: Convection Chamber.</i> – Teacher Guide, Assessment, pp. 417-421. 	<p>Investigation/Activity</p> <p>Investigation 5: <i>Convection</i> Part 3: <i>Convection in Air, Step #11</i></p> <ul style="list-style-type: none"> – Teacher Guide pages 174 – Student Lab Notebook, p. 29, Convection Chamber <i>Teacher Answer Master Sheet: pp. 393</i> – Transparency No. 15 – Calculating Density – Assessment Master, p. 455: Assessment Chart for Inv. 5, Part 5.3: Convection Chamber Student Sheet <i>Teacher Answer Master Sheet: pp. 393</i> – Assessment Chart for Inv. 5, Mid-summative Exam 5 – Mid-summative exam 5, page 463-464 Assessment Scoring Guide, pages 432-433 <p>Extending the Experience: Teacher Guide pages 175 – Practice Calculating Density</p> <p>Note: <i>PS 3.1f can be met calculating the density of solids, see illustration on p. 146 for more ideas.</i></p>	<p>Science Materials Supplied by the Teacher</p> <p>Calculators</p> <p>AV Equipment</p> <ul style="list-style-type: none"> • Multimedia set-up for CD-ROM

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<p>Lesson 24 (45 min)</p> <p>Objective(s):</p> <p>Content Water changes from gas to liquid by condensation.</p> <p>Process Use ice water to cool air to produce condensation.</p>	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> • General Skills: 1, 2, 3, 4, 5, 8 • Physical Setting Skills: • PS 3.1c, 3.2a, 4.2c 	
<p>Advanced Planning/Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide Overview, pp. 177-189 taking note of: pp. 178-181 Inv. 6 “At A Glance” p. 189 “Why Do I Have to Learn This?” – Teacher Guide Materials & Getting Ready, pp. 190-191 taking note of p. 190 Step 1. Begin a Second Round of Weather Observations. p. 190 Step 2. Consider Humidity – Find local dew point. p. 190 Step 4. Plan for ICE. – Teacher Guide, Assessment, pp. 417-421. 	<p>Investigation/Activity</p> <p>Investigation 6: <i>Convection</i> Part 1: <i>Is Water Really There?, Steps #1-11</i></p> <ul style="list-style-type: none"> – Teacher Guide pages 192-193 – Student Lab Notebook, p. 1, <i>Class Weather Chart</i> – Assessment Master, p. 455: Assessment Chart for Inv. 6, Part 6.1: Teacher Observations: <ul style="list-style-type: none"> - Plan and conduct investigation - Construct explanation; - Communicate ideas 	<p>Science Materials Supplied by the Teacher</p> <p>Containers (pie plates, bottles, cups) (optional)</p> <p>Water</p> <p>Pitchers</p> <p>Ice</p> <p>Plastic wrap (optional)</p> <p>AV Equipment</p> <ul style="list-style-type: none"> • Overhead projector

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<p>Lesson 25 (45 min)</p> <p>Objective(s):</p> <p>Content Water changes from gas to liquid by condensation.</p> <p>Process Use ice water to cool air to produce condensation.</p>	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> • General Skills: 1, 2, 3, 4, 5, 8 • Physical Setting Skills: • PS 3.1c, 3.2a, 4.2c 	
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide Overview, pp. 177-189 taking note of: pp. 178-181 Inv. 6 “At A Glance” p. 189 “Why Do I Have to Learn This?” – Teacher Guide Materials & Getting Ready, pp. 194-195 taking note of p. 195 Step 1. Plan for Room Temperature Water. p. 195 Step 2. Cut Muslin. – Teacher Guide, Assessment, pp. 417-421. 	<p>Investigation/Activity</p> <p>Investigation 6: <i>Convection</i> Part 2: <i>Evaporation and Humidity, Steps #1-10</i></p> <ul style="list-style-type: none"> – Teacher Guide pages 196-198 – Student Lab Notebook, p. 31, <i>Relative Humidity Teacher Answer Master Sheet: p. 394</i> – Transparency No. 16 – Relative Humidity 	<p>Science Materials Supplied by the Teacher</p> <p>Watch or Stopwatch Water Pitchers</p> <p>AV Equipment</p> <ul style="list-style-type: none"> • Overhead projector

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<p>Lesson 26 (45 min)</p> <p>Objective(s):</p> <p>Content</p> <ul style="list-style-type: none"> Water changes from liquid to gas (vapor) by evaporation. Relative humidity is the percentage of water vapor in air compared to the amount of water vapor needed to saturate that air at a specific temperature. <p>Process</p> <p>Measure changes in temperature due to evaporation.</p>	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> General Skills: 1, 2, 3, 4, 5, 8 Physical Setting Skills: <ul style="list-style-type: none"> PS 3.1c, 3.2a, 4.2c 	
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> Teacher Guide Overview, pp. 177-189 taking note of: <ul style="list-style-type: none"> pp. 178-181 Inv. 6 “At A Glance” p. 189 “Why Do I Have to Learn This?” Teacher Guide Materials & Getting Ready, pp. 194-195 taking note of <ul style="list-style-type: none"> p. 195 Step 1. Plan for Room Temperature Water. p. 195 Step 2. Cut Muslin. Teacher Guide, Assessment, pp. 417-421. 	<p>Investigation/Activity</p> <p>Investigation 6: <i>Convection</i> Part 2: <i>Evaporation and Humidity, Steps #11-13</i></p> <ul style="list-style-type: none"> Teacher Guide pages 196-199 Student Lab Notebook, p. 31, <i>Relative Humidity Teacher Answer Master Sheet: pp. 394</i> Student Lab Notebook, p. 33, <i>Water in The Air Teacher Answer Master Sheet: pp. 395</i> Transparency No. 16 – Relative Humidity Assessment Master, p. 455: <ul style="list-style-type: none"> Assessment Chart for Inv. 6, Part 6.2: Response Sheet – Water in the Air <i>Teacher Answer Master Sheet: pp. 395</i> Assessment Scoring Guide, pages 434-435 	<p>Science Materials Supplied by the Teacher</p> <p>AV Equipment</p> <ul style="list-style-type: none"> Overhead projector

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- Locate Living Materials Cards – Part Nos. 270-4380 (Milkweed Bugs) and 270-4379 (Miniecosystem organisms)
- Plan to order Milkweed bugs so they arrive 7 – 10 days before you begin Populations and Ecosystems Investigation 1: Milkweed Bugs. Allow 4 weeks for delivery.

<p>Lesson 27 (45 min)</p> <p>Objective(s):</p> <p>Content</p> <ul style="list-style-type: none"> • Relative humidity is the percentage of water vapor in air compared to the amount of water vapor needed to saturate that air at a specific temperature. • Dew point is the temperature at which air is saturated with water vapor. <p>Process</p> <p>Determine dew point by cooling water in a container until condensation occurs on the container.</p>	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> • General Skills: 1, 2, 3, 4, 5, 8 • Physical Setting Skills: • PS 3.1a, 3.1c, 3.2a 	
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide Overview, pp. 177-189 taking note of: pp. 178-181 Inv. 6 “At A Glance” p. 189 “Why Do I Have to Learn This?” – Teacher Guide Materials & Getting Ready, pp. 200-201 taking note of p. 201 Step 1. Look Up Dew-Point for Your Area p. 201 Step 3. Think About the Math. – Teacher Guide, Assessment, pp. 417-421 	<p>Investigation/Activity</p> <p>Investigation 6: <i>Convection</i> Part 3: <i>Condensation and Dew Point, Steps #1-9</i></p> <ul style="list-style-type: none"> – Teacher Guide pages 202-204 – Student Lab Notebook, p. 35, <i>Dew-Point Questions Teacher Answer Master Sheet: pp. 396</i> – Transparency No. 17 – Humidity Calculator – Transparency No. 18 – Temperature Number Line (optional) – Assessment Master, p. 455: 	<p>Science Materials Supplied by the Teacher</p> <p>Water Ice cubes</p> <p>AV Equipment</p> <ul style="list-style-type: none"> • Overhead projector

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<p>Lesson 28 (45 min)</p> <p>Objective(s):</p> <p>Content</p> <ul style="list-style-type: none"> Relative humidity is the percentage of water vapor in air compared to the amount of water vapor needed to saturate that air at a specific temperature. Dew point is the temperature at which air is saturated with water vapor. <p>Process</p> <p>Determine dew point by cooling water in a container until condensation occurs on the container.</p>	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> General Skills: 1, 2, 3, 4, 5, 8 Physical Setting Skills: <ul style="list-style-type: none"> PS 3.1a, 3.1c, 3.2a 	
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> Teacher Guide Overview, pp. 177-189 taking note of: <ul style="list-style-type: none"> pp. 178-181 Inv. 6 “At A Glance” p. 189 “Why Do I Have to Learn This?” Teacher Guide Materials & Getting Ready, pp. 200-201 taking note of <ul style="list-style-type: none"> p. 201 Step 1. Look Up Dew-Point for Your Area. p. 201 Step 3. Think About the Math. Teacher Guide, Assessment, pp. 417-421. 	<p>Investigation/Activity</p> <p>Investigation 6: <i>Convection</i> Part 3: <i>Condensation and Dew Point, Steps #1-9</i></p> <ul style="list-style-type: none"> Teacher Guide pages 204-205 Student Lab Notebook, p. 35, <i>Dew-Point Questions Teacher Answer Master Sheet: pp. 396</i> Transparency No. 17 – Humidity Calculator Transparency No. 18 – Temperature Number Line (optional) Assessment Master, p. 455: <ul style="list-style-type: none"> Assessment Chart for Inv. 6, Part 6.3: Student Sheet – Dew-Point Questions <i>Teacher Answer Master Sheet: pp. 396</i> FOSS Weather & Water Resource Book: <ul style="list-style-type: none"> Dragon’s Breath p. 34-36 Teacher Master Answer Sheet: pp. 397 	<p>Science Materials Supplied by the Teacher</p> <p>Water</p> <p>AV Equipment</p> <ul style="list-style-type: none"> Overhead projector

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<p>Lesson 29 (45 min)</p> <p>Objective(s):</p> <p>Process</p> <ul style="list-style-type: none"> • Observe changes in temperature due to pressure change. • Use pressure to produce a cloud in a bottle. • Explain how dew and clouds form when humid air cools to its dew point and condenses. 	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> • General Skills: 1, 2, 3, 4, 5, 8 • Physical Setting Skills: • PS 3.1c, 3.2a, 4.2a 	
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide Overview, pp. 177-189 taking note of: pp. 178-181 Inv. 6 “At A Glance” p. 189 “Why Do I Have to Learn This?” – Teacher Guide Materials & Getting Ready, pp. 206-208 taking note of p. 207 Step 1. Collect 2-liter soda bottles. p. 207 Step 2. Preview Multimedia – Video Resources p. 207 Steps 3 and 4. PRACTICE ACTIVITIES! – Teacher Guide, Assessment, pp. 417-421. 	<p>Investigation/Activity</p> <p>Investigation 6: <i>Convection</i> Part 4: <i>Clouds and Precipitation, Steps #1-9</i></p> <ul style="list-style-type: none"> – Teacher Guide pages 209-210 – Student Lab Notebook, p. 37, <i>Pressure/Temperature Demonstration Teacher Answer Master Sheet: pp. 400</i> – Transparency No. 19 – Raindrops and Cloud Droplets – CD-ROM/Multimedia: Video Resources→Cloud in a Bottle – Assessment Master, p. 455: Assessment Chart for Inv. 6, Part 6.4: Student Sheet – Pressure Temperature Demonstration <i>Teacher Answer Master Sheet: pp. 400</i> 	<p>Science Materials Supplied by the Teacher</p> <p>(2-8) 2-liter soda bottles Masking Tape Matches Water</p> <p>AV Equipment</p> <ul style="list-style-type: none"> • Overhead projector • Multimedia set-up for CD-ROM

Grade 6

<p>Lesson 30 (45 min)</p> <p>Objective(s):</p> <p>Process</p> <ul style="list-style-type: none"> • Observe changes in temperature due to pressure change. • Use pressure to produce a cloud in a bottle. • Explain how dew and clouds form when humid air cools to its dew point and condenses. 	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> • General Skills: 1, 2, 3, 4, 5, 8 • Physical Setting Skills: • PS 3.1c, 3.2a, 4.2c 	
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide Overview, pp. 177-189 taking note of: pp. 178-181 Inv. 6 “At A Glance” p. 189 “Why Do I Have to Learn This?” – Teacher Guide Materials & Getting Ready, pp. 206-208 taking note of p. 207 Step 1. Collect 2-liter soda bottles. p. 207 Step 2. Preview Multimedia – <i>Video Resources</i> p. 207 Steps 3 and 4. PRACTICE ACTIVITIES! – Teacher Guide, Assessment, pp. 417-421. 	<p>Investigation/Activity</p> <p>Investigation 6: <i>Convection</i> Part 4: <i>Clouds and Precipitation, Steps #10-17</i></p> <ul style="list-style-type: none"> – Teacher Guide pages 211-213 – Transparency No. 19 – Raindrops and Cloud Droplets – CD-ROM/Multimedia: Video Resources→Cloud in a Bottle – Assessment Master, p. 455: 	<p>Science Materials Supplied by the Teacher</p> <p>(2-8) 2-liter soda bottles Masking Tape Matches Water</p> <p>AV Equipment</p> <ul style="list-style-type: none"> • Overhead projector • Multimedia set-up for CD-ROM

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<p>Lesson 31 (45 min)</p> <p>Objective(s):</p> <p>Process</p> <ul style="list-style-type: none"> • Observe changes in temperature due to pressure change. • Use pressure to produce a cloud in a bottle. • Explain how dew and clouds form when humid air cools to its dew point and condenses. 	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> • General Skills: 1, 2, 3, 4, 5, 8 • Physical Setting Skills: • PS 3.1c, 3.2a, 4.2c 	
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide Overview, pp. 177-189 taking note of: pp. 178-181 Inv. 6 “At A Glance” p. 189 “Why Do I Have to Learn This?” – Teacher Guide Materials & Getting Ready, pp. 206-208 taking note of p. 207 Step 1. Collect 2-liter soda bottles. p. 207 Step 2. Preview Multimedia – Video Resources p. 207 Step 3 and 4. PRACTICE ACTIVITIES! – Teacher Guide, Assessment, pp. 417-421. 	<p>Investigation/Activity</p> <p>Investigation 6: <i>Convection</i> Part 4: <i>Clouds and Precipitation, Steps #18-21</i></p> <ul style="list-style-type: none"> – Teacher Guide pages 213 – Transparency No. 19 – Raindrops and Cloud Droplets – CD-ROM/Multimedia: Video Resources, Cloud in a Bottle – Assessment Master, p. 455: Assessment Chart for Inv. 6, Part 6.4: Student Sheet – Pressure Temperature Demonstration <i>Teacher Answer Master Sheet: pp. 400</i> – <i>FOSS Weather & Water Resource Book: Raindrops and Cloud Droplets, p.80</i> – <i>FOSS Weather & Water Resource Book: Observing Clouds, pp. 37-42</i> <i>Teacher Answer Master Sheet pp. 398</i> 	<p>Science Materials Supplied by the Teacher</p> <p>(2-8) 2-liter soda bottles Masking Tape Matches Water</p> <p>AV Equipment</p> <ul style="list-style-type: none"> • Overhead projector • Multimedia set-up for CD-ROM

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<p>Lesson 32 (45 min)</p> <p>Objective(s):</p> <p>Content Dew point is the temperature at which air is saturated with water vapor.</p> <p>Process Predict cloud formation by analyzing radiosonde sounding data.</p>	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> • General Skills: 1, 2, 3, 4, 5, 8 • Physical Setting Skills: • PS 3.1a, 4.2c 	
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide Overview, pp. 177-189 taking note of: pp. 178-181 Inv. 6 “At A Glance” p. 189 “Why Do I Have to Learn This?” – Teacher Guide Materials & Getting Ready, pp. 214-215 taking note of p. 215 Step 1. Consider Optional Activity. p. 215 Step 2. Preview Multimedia. – Teacher Guide, Assessment, pp. 417-421. 	<p style="text-align: center;">Investigation/Activity</p> <p>Investigation 6: <i>Convection</i> Part 5: <i>Weather Balloons, Steps #1-4</i></p> <ul style="list-style-type: none"> – Teacher Guide pages 216-217 – Student Lab Notebook, p. 39, <i>Weather Balloon Simulation Teacher Answer Master Sheet: pp. 399</i> – Student Lab Notebook, p. 40, <i>Upper-Air Sounding Graph Teacher Answer Master Sheet: pp. 402-405</i> – Student Lab Notebook, p. 41, <i>Temperature Number Line</i> – Transparency No. 18 – Temperature Number Line – Transparency No. 20 – Upper-Air Sounding Graph – Transparency No. 21 – Upper-Air Sounding Graph for Oakland – Transparency No. 22 – Upper-Air Sounding Graph for Oakland (finished) – CD-ROM/Multimedia: Control Room→Atmospheric Data, Weather Balloon Launch Video & Simulation – Assessment Master, p. 455: Assessment Chart for Inv. 6, Part 6.5: Self-Assessment – Quick Write from Investigation 1 <i>Teacher Answer Master Sheet: pp. 422</i> – <i>FOSS Weather & Water Resource Book: Weather Balloons and Upper-Air Soundings, pp.43-44</i> <i>Teacher Answer Master Sheet pp. 401</i> 	<p style="text-align: center;">Science Materials Supplied by the Teacher</p> <p>Colored pencils</p> <p>AV Equipment</p> <ul style="list-style-type: none"> • Overhead projector • Multimedia set-up for CD-ROM

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<p>Lesson 33 (45 min) Objective(s): Content Dew point is the temperature at which air is saturated with water vapor. Process Predict cloud formation by analyzing radiosonde sounding data.</p>	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> • General Skills: 1, 2, 3, 4, 5, 8 • Physical Setting Skills: • PS 3.1a, 4.2c 	
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide Overview, pp. 177-189 taking note of: pp. 178-181 Inv. 6 “At A Glance” p. 189 “Why Do I Have to Learn This?” – Teacher Guide Materials & Getting Ready, pp. 214-215 taking note of p. 215 Step 1. Consider Optional Activity. p. 215 Step 2. Preview Multimedia. – Teacher Guide, Assessment, pp. 417-421. 	<p style="text-align: center;">Investigation/Activity</p> <p>Investigation 6: <i>Convection</i> Part 5: <i>Weather Balloons, Steps #5-14</i></p> <ul style="list-style-type: none"> – Teacher Guide pages 217-222 – Student Lab Notebook, p. 39, <i>Weather Balloon Simulation Teacher Answer Master Sheet: pp. 399</i> – Student Lab Notebook, p. 40, <i>Upper-Air Sounding Graph Teacher Answer Master Sheet: pp. 402-405</i> – Student Lab Notebook, p. 41, <i>Temperature Number Line</i> – Transparency No. 18 – Temperature Number Line – Transparency No. 20 – Upper-Air Sounding Graph – Transparency No. 21 – Upper-Air Sounding Graph for Oakland – Transparency No. 22 – Upper-Air Sounding Graph for Oakland (finished) – CD-ROM/Multimedia: Control Room→Atmospheric Data, Weather Balloon Launch Video & Simulation – Assessment Master, p. 455: Assessment Chart for Inv. 6, Part 6.5: Self-Assessment – Quick Write from Investigation 1 <i>Teacher Answer Master Sheet: pp. 422</i> – Assessment Chart for Inv. 6, Mid-summative Exam 6 – Mid-summative exam 6, page 465 Assessment Scoring Guide, pages 436 <p>Extending the Experience: Teacher Guide pages 221-221</p> <ul style="list-style-type: none"> – Consider these enrichment activities ESPECIALLY #1 – Investigate Transpiration and #4 Explore Evaporation that will support concepts in the Unit 3 & 4 study of <i>FOSS Populations and Ecosystems</i>. 	<p>Science Materials Supplied by the Teacher</p> <p>Colored pencils</p> <p>AV Equipment</p> <ul style="list-style-type: none"> • Overhead projector • Multimedia set-up for CD-ROM

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- Order – Part No. 270-4380 - Milkweed Bugs
- Plan to order Milkweed bugs so they arrive 7 – 10 days before you begin Populations and Ecosystems Investigation 1: Milkweed Bugs. Allow 4 weeks for delivery.

<p>Lesson 34 (45 min)</p> <p>Objective(s):</p> <p>Content</p> <ul style="list-style-type: none"> • Most of Earth’s water is in the oceans as salt water. • Earth’s fresh water is found in many locations, including in the atmosphere, lakes, rivers, groundwater, and glaciers. • A water molecule might follow many different paths as it travels in the water cycle. <p>Process</p> <p>Engage in simulations to follow the movement of a molecule of water through the water cycle.</p>	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> • General Skills: 1, 4, 7, 8 • Physical Setting Skills: • PS 2.1d, 2.1j 	
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide Overview, pp. 223-231 taking note of: pp. 224-225 Inv. 7 “At A Glance” p. 231 “Why Do I Have to Learn This?” – Teacher Guide Materials & Getting Ready, pp. 232-233 taking note of p. 233 Step 1. Photocopy Water-Location Posters. p. 233 Step 2. Review Water-Distribution Demonstration p. 233 Step 3. Preview the Tally Sheet. p. 233 Step 4. Plan to Show VIDEO: <i>Water Works: Careers in Hydrology</i>. – Teacher Guide, Assessment, pp. 417-421. 	<p>Investigation/Activity</p> <p>Investigation 7: <i>The Water Planet</i> Part 1: <i>Water-Cycle Game, Steps #1-12</i></p> <ul style="list-style-type: none"> – Teacher Guide pages 234-238 – Student Lab Notebook, p. 43, <i>Water-Cycle Game</i> – <i>FOSS Weather & Water Resource Book: Water-Cycle Game Rules: Plain Version, pp. 82</i> – Transparency No. 23 – Earth: The Water Planet – Transparency No. 24 – Water-Cycle Game Tally – Special Teacher Master Nos. 2-10 – <i>Water Location Posters</i> – Assessment Master, p. 456: Assessment Chart for Inv. 7, Part 7.1: Quick Write Assessment Scoring Guide, pages 437 	<p>Science Materials Supplied by the Teacher</p> <p>Globe (12 in. diameter) Chart paper Marking pens Water</p> <p>AV Equipment</p> <ul style="list-style-type: none"> • Overhead projector • VCR with monitor

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	<p>Lesson 35 (45 min) Objective(s): Content</p> <ul style="list-style-type: none"> • Most of Earth’s water is in the oceans as salt water. • Earth’s fresh water is found in many locations, including in the atmosphere, lakes, rivers, groundwater, and glaciers. • A water molecule might follow many different paths as it travels in the water cycle. <p>Process Engage in simulations to follow the movement of a molecule of water through the water cycle.</p>	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> • General Skills: 1, 4, 7, 8 • Physical Setting Skills: • PS 2.1d, 2.1j 	
<p>WEEK 7</p>	<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide Overview, pp. 223-231 taking note of: pp. 224-225 Inv. 7 “At A Glance” p. 231 “Why Do I Have to Learn This?” – Teacher Guide Materials & Getting Ready, pp. 232-233 taking note of p. 233 Step 1. Photocopy Water-Location Posters. p. 233 Step 2. Review Water-Distribution Demonstration. p. 233 Step 3. Preview the Tally Sheet. p. 233 Step 4. Plan to Show VIDEO: Water Works: Careers in Hydrology. – Prepare to hang the Water Cycle poster in the classroom at the conclusion of this investigation. – Teacher Guide, Assessment, pp. 417-421. 	<p style="text-align: center;">Investigation/Activity</p> <p>Investigation 7: <i>The Water Planet</i> Part 1: <i>Water-Cycle Game, Steps #13-17</i></p> <ul style="list-style-type: none"> – Teacher Guide pages 238-239 – Student Lab Notebook, p. 43, <i>Water-Cycle Game</i> – <i>FOSS Weather & Water Resource Book: Water-Cycle Game Rules: Plain Version, pp. 82</i> – Transparency No. 23 – Earth: The Water Planet – Transparency No. 24 – Water-Cycle Game Tally – Special Teacher Master Nos. 2-10 – <i>Water Location Posters</i> – Video – <i>Water Works: Careers in Hydrology</i> – Assessment Master, p. 456: Assessment Chart for Inv. 7, Part 7.1: Quick Write Assessment Scoring Guide, pages 437 – <i>FOSS Weather & Water Resource Book: Earth: The Water Planet, pp. 45-47</i> 	<p style="text-align: center;">Science Materials Supplied by the Teacher</p> <p>Globe (12 in. diameter) Chart paper Marking pens Water</p> <p>AV Equipment</p> <ul style="list-style-type: none"> • Overhead projector • VCR with monitor

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	<p>Lesson 36 (45 min) Objective(s): Content A water molecule might follow many different paths as it travels in the water cycle. Process</p> <ul style="list-style-type: none"> Engage in simulations to follow the movement of a molecule of water through the water cycle. Explain with words and drawings how evaporation, condensation, precipitation, and other processes produce many variations of the water cycle. 	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> General Skills: 1, 4, 7, 8 Physical Setting Skills: PS 2.1d, 2.1j 	
WEEK 7	<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> Teacher Guide Overview, pp. 223-231 taking note of: pp. 224-225 Inv. 7 “At A Glance” p. 231 “Why Do I Have to Learn This?” Teacher Guide Materials & Getting Ready, pp. 240-241 taking note of p. 241 Step 1. Multimedia Setup (See Step 5 of Conducting the Investigation for more suggestions.) p. 241 Step 2. Preview Multimedia. Teacher Guide, Assessment, pp. 417-421. 	<p style="text-align: center;">Investigation/Activity</p> <p>Investigation 7: <i>The Water Planet</i> Part 2: <i>Water-Cycle Game, Steps #1-8</i></p> <ul style="list-style-type: none"> Teacher Guide pages 242-243 Student Lab Notebook, p. 43, <i>Water-Cycle Game</i> <i>FOSS Weather & Water Resource Book: Water-Cycle Game Rules: Plain Version, pp. 82</i> Transparency No. 24 – Water-Cycle Game Tally CD-ROM/Multimedia: Control Room→Water Cycle Assessment Master, p. 456: 	<p style="text-align: center;">Science Materials Supplied by the Teacher</p> <p>Chart paper Marking pens</p> <p>AV Equipment</p> <ul style="list-style-type: none"> Overhead projector Multimedia set-up for CD-ROM

Grade 6

<p>Lesson 37 (45 min)</p> <p>Objective(s):</p> <p>Content A water molecule might follow many different paths as it travels in the water cycle.</p> <p>Process</p> <ul style="list-style-type: none"> Engage in simulations to follow the movement of a molecule of water through the water cycle. Explain with words and drawings how evaporation, condensation, precipitation, and other processes produce many variations of the water cycle. 	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> General Skills: 1, 4, 7, 8 Physical Setting Skills: PS 2.1d, 2.1j 	
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> Teacher Guide Overview, pp. 223-231 taking note of: pp. 224-225 Inv. 7 “At A Glance” p. 231 “Why Do I Have to Learn This?” Teacher Guide Materials & Getting Ready, pp. 240-241 taking note of p. 241 Step 1. Multimedia Setup (See Step 5 of Conducting the Investigation for more suggestions.) p. 241 Step 2. Preview Multimedia. Teacher Guide, Assessment, pp. 417-421. Save Group Water Cycle Posters from Step 9 for Investigation 9, Part 3. 	<p>Investigation/Activity</p> <p>Investigation 7: <i>The Water Planet</i> Part 2: <i>Water-Cycle Game, Steps #9-10</i></p> <ul style="list-style-type: none"> Teacher Guide page 243 CD-ROM/Multimedia: Control Room→Water Cycle Assessment Master, p. 456: Assessment Chart for Inv. 7, Mid-summative Exam 7 Mid-summative exam 7, page 466 Assessment Scoring Guide, pages 438 <p>Extending the Experience: Teacher Guide pages 244 Consider these enrichment activities ESPECIALLY #1 – Play the Inflatable Globe Game</p>	<p>Science Materials Supplied by the Teacher</p> <p>Chart paper Marking pens</p> <p>AV Equipment</p> <ul style="list-style-type: none"> Overhead projector Multimedia set-up for CD-ROM
<p>Unit 3 Begins: Complete Investigations 8 & 9 of FOSS® Weather and Water, then begin FOSS® Populations and Ecosystems</p>		

Grade 6

<p>Lesson 38 (45 min)</p> <p>Objective(s):</p> <p>Content Pressure exerted on a gas reduces its volume and increases its density.</p> <p>Process Apply pressure to a system and observe the compression of gas.</p>	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> • General Skills: 1, 2, 3, 4, 5, 7, 8 • Physical Setting Skills: 7, 9 • PS 3.1a, 3.1c 	
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide Overview, pp. 245-257 taking note of: pp. 245-249 Inv. 8 “At A Glance” – Teacher Guide Materials & Getting Ready, pp. 258-259 taking note of p. 259 Step 2. Assemble a Pressure Indicator. p. 259 Step 3. Preview Multimedia. – Teacher Guide, Assessment, pp. 417-421. 	<p>Investigation/Activity</p> <p>Investigation 8: <i>Air Pressure and Wind</i> Part 1: <i>Air Pressure Inquiry, Steps #1-10</i></p> <ul style="list-style-type: none"> – Teacher Guide pages 260-263 – Student Lab Notebook, p. 45, <i>Pressure in a Jar Teacher Answer Master Sheet: pp. 406</i> – Student Lab Notebook, p. 47, <i>Response Sheet – Air Pressure and Wind Teacher Answer Master Sheet: pp. 408</i> – Transparency No. 25 – Pressure Indicator – Transparency No. 26 – Gas in a Syringe – CD-ROM/Multimedia: Gas in a Syringe; Weather-Balloon Launch; Elevator to Space – Assessment Master, p. 456: – Assessment Chart for Inv. 8, Part 8.1 Response Sheet - Air Pressure and Wind Assessment Scoring Guide, pages 439-440 – <i>FOSS Weather & Water Resource Book: What is Air Pressure?, pp.48-52</i> <i>Teacher Answer Master Sheet pp. 407</i> 	<p>Science Materials Supplied by the Teacher</p> <p>Water</p> <p>AV Equipment</p> <ul style="list-style-type: none"> • Overhead projector • Multimedia set-up for CD-ROM

Grade 6

<p>Lesson 39 (45 min)</p> <p>Objective(s):</p> <p>Content Pressure exerted on a gas reduces its volume and increases its density.</p> <p>Process Apply pressure to a system and observe the compression of gas.</p>	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> • General Skills: 1, 2, 3, 4, 5, 7, 8 • Physical Setting Skills: 7, 9 • PS 3.1a, 3.1c 	
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide Overview, pp. 245-257 taking note of: pp. 245-249 Inv. 8 “At A Glance” – Teacher Guide Materials & Getting Ready, pp. 258-259 taking note of p. 259 Step 2. Assemble a Pressure Indicator. p. 259 Step 3. Preview Multimedia. – Teacher Guide, Assessment, pp. 417-421. 	<p>Investigation/Activity</p> <p>Investigation 8: <i>Air Pressure and Wind</i> Part 1: <i>Air Pressure Inquiry, Steps #11-14</i></p> <ul style="list-style-type: none"> – Teacher Guide pages 260-263 – Student Lab Notebook, p. 45, <i>Pressure in a Jar Teacher Answer Master Sheet: pp. 406</i> – Student Lab Notebook, p. 47, <i>Response Sheet – Air Pressure and Wind Teacher Answer Master Sheet: pp. 408</i> – Transparency No. 25 – Pressure Indicator – Transparency No. 26 – Gas in a Syringe – CD-ROM/Multimedia: Gas in a Syringe; Weather-Balloon Launch; Elevator to Space – Assessment Master, p. 456: – Assessment Chart for Inv. 8, Part 8.1 Response Sheet - Air Pressure and Wind – Assessment Scoring Guide, pages 439-440 	<p>Science Materials Supplied by the Teacher</p> <p>Water</p> <p>AV Equipment</p> <ul style="list-style-type: none"> • Overhead projector • Multimedia set-up for CD-ROM

Grade 6

<p>Lesson 40 (45 min)</p> <p>Objective(s):</p> <p>Content</p> <ul style="list-style-type: none"> Differential heating of Earth’s surface by the Sun can create high- and low-pressure areas. Wind is movement of air from an area of high pressure to an area of low pressure. Local winds, called sea breezes, land breezes, mountain breezes, and valley breezes, blow in predictable ways determined by local differential heating. <p>Process</p> <ul style="list-style-type: none"> Describe the relationship between changing air pressure and wind. Explain how differential heating of Earth by the Sun creates local winds. 		<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> General Skills: 1, 2, 3, 4, 5, 7, 8 Physical Setting Skills: 7, 9 PS 2.2k, 2.2l, 2.2m, 2.2n, 2.2o, 2.2p
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> Teacher Guide Overview, pp. 245-257 taking note of: pp. 245-249 Inv. 8 “At A Glance.” Teacher Guide Materials & Getting Ready, pp. 265-266. taking note of p. 265 Step 1. Gather Materials for Wind Models. p. 265 Step 3. Preview Multimedia. Teacher Guide, Assessment, pp. 417-421. 	<p>Investigation/Activity</p> <p>Investigation 8: <i>Air Pressure and Wind</i> Part 2: <i>Wind Models, Steps #1-8</i></p> <ul style="list-style-type: none"> Teacher Guide pages 267-268 Student Lab Notebook, p. 48-49, <i>Local Winds Teacher Answer Master Sheet: pp. 409-410</i> Transparency No. 27 – Wind-Model Review Questions Transparency No. 28 – Wind Concepts Assessment Master, p. 456 Assessment Chart for Inv. 8, Part 8.2 Quick Write – Wind Assessment Scoring Guide, pages 441 	<p>Science Materials Supplied by the Teacher</p> <p>Tape or glue Scissors Marking pens Construction paper Tagboard Staplers Globe</p> <p>AV Equipment</p> <ul style="list-style-type: none"> Overhead projector

Grade 6

<p>Lesson 41 (45 min)</p> <p>Objective(s):</p> <p>Content</p> <ul style="list-style-type: none"> Differential heating of Earth’s surface by the Sun can create high- and low-pressure areas. Wind is movement of air from an area of high pressure to an area of low pressure. Local winds, called sea breezes, land breezes, mountain breezes, and valley breezes, blow in predictable ways determined by local differential heating. <p>Process</p> <ul style="list-style-type: none"> Describe the relationship between changing air pressure and wind. Explain how differential heating of Earth by the Sun creates local winds. 	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> General Skills: 1, 2, 3, 4, 5, 7, 8 Physical Setting Skills: 7, 9 PS 2.2k, 2.2l, 2.2m, 2.2n, 2.2o, 2.2p 	
<p>Advanced Planning/Notes to Teachers</p> <ul style="list-style-type: none"> Teacher Guide Overview, pp. 245-257 taking note of: pp. 245-249 Inv. 8 “At A Glance.” Teacher Guide Materials & Getting Ready, pp. 265-266. taking note of p. 265 Step 1. Gather Materials for Wind Models. p. 265 Step 3. Preview Multimedia. Teacher Guide, Assessment, pp. 417-421. 	<p>Investigation/Activity</p> <p>Investigation 8: <i>Air Pressure and Wind</i> Part 2: <i>Wind Models, Steps #9-12</i></p> <ul style="list-style-type: none"> Teacher Guide pages 268-269 Student Lab Notebook, p. 48-49, <i>Local Winds Teacher Answer Master Sheet: pp. 409-410</i> Transparency No. 27 – Wind-Model Review Questions Transparency No. 28 – Wind Concepts Assessment Master, p. 456 Assessment Chart for Inv. 8, Part 8.2 Quick Write – Wind Assessment Scoring Guide, pages 441 	<p>Science Materials Supplied by the Teacher</p> <p>Tape or glue Scissors Marking pens Construction paper Tagboard Staplers Globe</p> <p>AV Equipment</p> <ul style="list-style-type: none"> Overhead projector

Grade 6

<p>Lesson 42 (45 min)</p> <p>Objective(s):</p> <p>Content</p> <ul style="list-style-type: none"> Differential heating of Earth’s surface by the Sun can create high- and low-pressure areas. Wind is movement of air from an area of high pressure to an area of low pressure. Local winds, called sea breezes, land breezes, mountain breezes, and valley breezes, blow in predictable ways determined by local differential heating. <p>Process</p> <ul style="list-style-type: none"> Describe the relationship between changing air pressure and wind. Explain how differential heating of Earth by the Sun creates local winds. 	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> General Skills: 1, 2, 3, 4, 5, 7, 8 Physical Setting Skills: 7, 9 PS 2.2k, 2.2l, 2.2m, 2.2n, 2.2o, 2.2p 	
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> Teacher Guide Overview, pp. 245-257 taking note of: pp. 245-249 Inv. 8 “At A Glance.” Teacher Guide Materials & Getting Ready, pp. 265-266 taking note of p. 265 Step 1. Gather Materials for Wind Models. p. 265 Step 3. Preview Multimedia. Teacher Guide, Assessment, pp. 417-421. 	<p>Investigation/Activity</p> <p>Investigation 8: <i>Air Pressure and Wind</i> Part 2: <i>Wind Models, Steps #13-17</i></p> <ul style="list-style-type: none"> Teacher Guide pages 269-270 Student Lab Notebook, pp. 48-49, <i>Local Winds Teacher Answer Master Sheet: pp. 409-410</i> Transparency No. 27 – Wind-Model Review Questions Transparency No. 28 – Wind Concepts CD-ROM/Multimedia: Climate Factors→Local Wind Assessment Master, p. 456: Assessment Chart for Inv. 8, Part 8.2 Quick Write - Wind Assessment Scoring Guide, pages 441 <i>FOSS Weather & Water Resource Book: Where the Wild Wind Blows, pp. 53-55 Teacher Answer Master Sheet p. 411</i> 	<p>Science Materials Supplied by the Teacher</p> <p>Tape or glue Scissors Marking pens Construction paper Tagboard Staplers Globe</p> <p>AV Equipment</p> <ul style="list-style-type: none"> Overhead projector Multimedia set-up for CD-ROM

Grade 6

<p>Lesson 43 (45 min)</p> <p>Objective(s):</p> <p>Content Wind speed is measured with an instrument called an anemometer.</p> <p>Process Build an anemometer and use it to gather data.</p>	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> • General Skills: 1, 2, 3, 4, 5, 7, 8 • Physical Setting Skills: 7, 9 • PS 2.2m 	
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide Overview, pp. 245-257 taking note of: pp. 245-249 Inv. 8 “At A Glance.” – Teacher Guide Materials & Getting Ready, pp. 271-272 taking note of p. 272 Step 1. Make a Transparency of a CURRENT Weather Report. p. 272 Step 2. Build an Anemometer. p. 272 Step 3. Calibrate Barometers. p. 272 Step 4. Get a School Map. – Teacher Guide, Assessment, pp. 417-421. 	<p>Investigation/Activity</p> <p>Investigation 8: <i>Air Pressure and Wind</i> Part 3: <i>Measuring Wind, Steps #1-10</i></p> <ul style="list-style-type: none"> – Teacher Guide pages 273-275 – Student Lab Notebook, p. 50-51, <i>Making an Anemometer</i> – Assessment Master, p. 456: – Assessment Chart for Inv. 8, Part 8.2 Self-Assessment: Quick Write - Wind Assessment Scoring Guide, pages 441 	<p>Science Materials Supplied by the Teacher</p> <p>Metric Ruler Scissors Pencil / Ballpoint pen Tape Chart paper Blank Transparencies</p> <p>AV Equipment</p> <ul style="list-style-type: none"> • Overhead projector

Grade 6

<p>Lesson 44 (45 min)</p> <p>Objective(s):</p> <p>Content Wind speed is measured with an instrument called an anemometer.</p> <p>Process Build an anemometer and use it to gather data.</p>	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> • General Skills: 1, 2, 3, 4, 5, 7, 8 • Physical Setting Skills: 7, 9 • PS 2.2m 	
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide Overview, pp. 245-257 taking note of: pp. 245-249 Inv. 8 “At A Glance.” – Teacher Guide Materials & Getting Ready, pp. 271-272 taking note of p. 272 Step 1. Make a Transparency of a CURRENT Weather Report. p. 272 Step 2. Build an Anemometer. p. 272 Step 3. Calibrate Barometers. p. 272 Step 4. Get a School Map. – Teacher Guide, Assessment, pp. 417-421. 	<p>Investigation/Activity</p> <p>Investigation 8: <i>Air Pressure and Wind</i> Part 3: <i>Measuring Wind, Steps #11-15</i></p> <ul style="list-style-type: none"> – Teacher Guide pages 275 – Student Lab Notebook, pp. 50-51, <i>Making an Anemometer</i> – Assessment Master, p. 456: – Assessment Chart for Inv. 8, Part 8.2 Self-Assessment: Quick Write – Wind Assessment Scoring Guide, pages 441 – <i>FOSS Weather & Water Resource Book: Laura’s Big Day, pp.57</i> <i>Teacher Answer Master Sheet p. 412</i> 	<p>Science Materials Supplied by the Teacher</p> <p>Metric Ruler Scissors Pencil / Ballpoint pen Tape Chart paper Blank transparencies</p> <p>AV Equipment</p> <ul style="list-style-type: none"> • Overhead projector

Grade 6

<p>Lesson 45 (45 min)</p> <p>Objective(s):</p> <p>Content Wind speed is measured with an instrument called an anemometer.</p> <p>Process Build an anemometer and use it to gather data.</p>	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> • General Skills: 1, 2, 3, 4, 5, 7, 8 • Physical Setting Skills: 7, 9 • PS 2.2m 	
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide Overview, pp. 245-257 taking note of: pp. 245-249 Inv. 8 “At A Glance.” – Teacher Guide Materials & Getting Ready, pp. 271-272 taking note of p. 272 Step 1. Make a Transparency of a CURRENT Weather Report. p. 272 Step 2. Build an Anemometer. p. 272 Step 3. Calibrate Barometers. p. 272 Step 4. Get a School Map. – Teacher Guide, Assessment, pp. 417-421. 	<p>Investigation/Activity</p> <p>Investigation 8: <i>Air Pressure and Wind</i> Part 3: <i>Measuring Wind, Steps #11-15 cont’d</i></p> <p>NOTE: This is the third day of Wind Data Collection. Class data may be gathered and shared among classes over 3 days to be analyzed by all classes.</p> <ul style="list-style-type: none"> – Teacher Guide pages 275 – Student Lab Notebook, pp. 50-51, <i>Making an Anemometer</i> – Assessment Master, p. 456: – Assessment Chart for Inv. 8, Part 8.2 Self-Assessment: Quick Write – Wind Assessment Scoring Guide, p. 441 – <i>FOSS Weather & Water Resource Book: Laura’s Big Day, p.57 Teacher Answer Master Sheet p. 412</i> 	<p>Science Materials Supplied by the Teacher</p> <p>Metric Ruler Scissors Pencil / Ballpoint pen Tape Chart paper Blank transparencies</p> <p>AV Equipment</p> <ul style="list-style-type: none"> • Overhead projector

Grade 6

<p>Lesson 46 (45 min)</p> <p>Objective(s):</p> <p>Content Air pressure is represented on a map by contour lines called isobars.</p> <p>Process Interpret a pressure map.</p>	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> • General Skills: 1, 2, 3, 4, 5, 7, 8 • Physical Setting Skills: 7, 9 • PS 2.2i, 2.2l, 2.2m, 2.2n, 2.2o 	
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide Overview, pp. 245-257 taking note of: pp. 245-249 Inv. 8 “At A Glance.” – Teacher Guide Materials & Getting Ready, pp. 276-277. – Teacher Guide, Assessment, pp. 417-421. – Prepare Holding Habitat for Milkweed Bugs. FOSS Pop. & Eco TG p. 39 and 42. 	<p>Investigation/Activity</p> <p>Investigation 8: <i>Air Pressure and Wind</i> Part 4: <i>Pressure Maps, Steps #1-6</i></p> <ul style="list-style-type: none"> – Teacher Guide pp. 278-279 – Student Lab Notebook, p. 53, <i>Pressure Map of the U.S.</i> – Transparency No. 29 – Pressure Map of the U.S. – Assessment Master, p. 456 – Assessment Chart for Inv. 8, Mid-summative Exam 8 – Mid-summative exam 8, pp. 467-468 – Assessment Scoring Guide, pp. 442-443 	<p>Science Materials Supplied by the Teacher</p> <p>AV Equipment</p> <ul style="list-style-type: none"> • Overhead projector
<p>Consult FOSS® Populations and Ecosystems Teacher Guide – Materials, Living Organisms p. 31</p> <ul style="list-style-type: none"> • Order – Part No. 270-4379 – Miniecosystem Organisms • Plan to order Mniecosystem Organisms so they arrive a few days before you begin Populations and Ecosystems Investigation 3: Miniecosystems. Allow 4 weeks for delivery. • Plan for arrival and care of organisms, see TG pp. 86-88 		

Grade 6

<p>Lesson 47 (45 min) Objective(s): Content Air masses are large bodies of air that are uniform in temperature and humidity. Process Set up a solar-heated bag to model the formation of an air mass.</p>	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> • General Skills: 1, 2, 3, 4, 5, 7, 8 • Physical Setting Skills: 7, 8 • PS 2.21, 4.2d 	
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide Overview, pp. 281-295 taking note of: pp. 282-285 Inv. 9 “At A Glance.” p. 295 “Why Do I Have to Learn This?” – Teacher Guide Materials & Getting Ready, pp. 296-298 taking note of p. 297 Step 1. Plan for a Sunny Day. p. 297 Step 2. Practice with the Solar Balloon. p. 297 Step 3. Preview the Multimedia. – Teacher Guide, Assessment, pp. 417-421. 	<p>Investigation/Activity</p> <p>Investigation 9: <i>Weather and Climate</i> Part 1: <i>Air Masses, Steps #1-15.</i></p> <ul style="list-style-type: none"> – Teacher Guide pp. 299-302 – Student Lab Notebook, p. 55, <i>Solar Balloon Observations Teacher Answer Master Sheet p. 413</i> – Transparency No. 30 – North American Air Masses – CD-ROM/Multimedia: (optional) Video Resources→Solar Balloon – Assessment Master, p. 457 – Assessment Chart for Investigation 9 	<p>Science Materials Supplied by the Teacher</p> <p>Globe Tape Black trash bags Glue sticks Scissors Clipboard</p> <p>AV Equipment</p> <ul style="list-style-type: none"> • Overhead projector • Multimedia set-up for CD-ROM (optional)

Grade 6

<p>Lesson 48 (45 min)</p> <p>Objective(s):</p> <p>Content</p> <ul style="list-style-type: none"> The boundary between two air masses that meet is called a front. Weather conditions usually change as a front passes by. <p>Process</p> <ul style="list-style-type: none"> Observe the interactions of two liquids of different densities as a model for frontal boundaries. Explain the interactions between two air masses in terms of their densities. 	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> General Skills: 1, 2, 3, 4, 7, 8 Physical Setting Skills: 7, 8 PS 2.2i, 2.2l, 2.2m, 2.2o, 2.2p 	
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> Teacher Guide Overview, pp. 281-295 taking note of: <ul style="list-style-type: none"> pp. 282-285 Inv. 9 “At A Glance.” p. 295 “Why Do I Have to Learn This?” Teacher Guide Materials & Getting Ready, pp. 303-304 taking note of <ul style="list-style-type: none"> p. 303 Step 1. Consider Projects or Reports. p. 303 Step 2. Preview the Multimedia. Teacher Guide, Assessment, pp. 417-421. 	<p>Investigation/Activity</p> <p>Investigation 9: <i>Weather and Climate</i> Part 2: <i>Air Masses, Steps #1-14.</i></p> <ul style="list-style-type: none"> Teacher Guide pp. 305-310 Student Lab Notebook, p. 57, <i>Reading Weather Maps Teacher Answer Master Sheet p. 414</i> Student Lab Notebook, p. 59, <i>Response Sheet – Weather and Climate Teacher Answer Master Sheet p. 415</i> Transparency No. 31 – Fronts Transparency No. 32 – Sample Weather-Map Symbol Transparency No. 33 – Surface Observations Transparency No. 34 – Weather-Satellite Image Assessment Master, p. 457: Assessment Chart for Inv. 9, Part 9.2 Self-Assessment: Response Sheet – Weather and Climate Assessment Scoring Guide, pp. 444-445 <i>FOSS Weather & Water Resource Book:</i> <ul style="list-style-type: none"> <i>Observing Clouds, p. 37</i> <i>Mr. Tornado, p. 67 (optional)</i> <i>Severe Weather, p. 69 (optional)</i> <i>Fronts, p. 85</i> <i>Weather and Fronts, p. 86</i> <i>Sample Weather-Map Symbol, p. 87</i> <i>Surface Observations, p. 88</i> <i>GOES-8 Weather-Satellite Image, p. 89</i> 	<p>Science Materials Supplied by the Teacher</p> <p>Density Bottle from Inv. 5, Part 1</p> <p>AV Equipment</p> <ul style="list-style-type: none"> Overhead projector

Grade 6

Lesson 49 (45 min)**Objective(s):****Content**

- The boundary between two air masses that meet is called a front.
- Weather conditions usually change as a front passes by.
- Weather conditions usually change as a front passes by.

Process

- Observe the interactions of two liquids of different densities as a model for frontal boundaries.
- Explain the interactions between two air masses in terms of their densities.

Alignment with NYS Core Curriculum:

- General Skills: 1, 2, 3, 4, 7, 8
- Physical Setting Skills: 7, 8
- PS 2.2i, 2.2l, 2.2m, 2.2o, 2.2p

**Advanced Planning/
Notes to Teachers**

- Teacher Guide Overview, pp. 281-295 taking note of:
pp. 282-285 Inv. 9 “At A Glance.”
p. 295 “Why Do I Have to Learn This?”
- Teacher Guide Materials & Getting Ready, pp. 303-304.
taking note of
p. 303 Step 1. Consider Projects or Reports.
p. 303 Step 2. Preview the Multimedia.
- Teacher Guide, Assessment, pp. 417-421.

Investigation/Activity

- Investigation 9: *Weather and Climate* Part 2: *Air Masses, Steps #15-17.*
- Teacher Guide pp. 305-310
 - Student Lab Notebook, p. 57, *Reading Weather Maps Teacher Answer Master Sheet p. 414*
 - Student Lab Notebook, p. 59, *Response Sheet – Weather and Climate Teacher Answer Master Sheet p. 415*
 - Transparency No. 31 – Fronts
 - Transparency No. 32 – Sample Weather-Map Symbol
 - Transparency No. 33 – Surface Observations
 - Transparency No. 34 – Weather-Satellite Image
 - CD-ROM/Multimedia: Climate Factors→Weather and Landforms Map
 - Assessment Master, p. 457:
 - Assessment Chart for Inv. 9, Part 9.2 Self-Assessment: Response Sheet – Weather and Climate
Assessment Scoring Guide, pp. 444-445
 - *FOSS Weather & Water Resource Book:*
Observing Clouds, p. 37
Mr. Tornado, p. 67 (optional)
Severe Weather, p. 69 (optional)
Fronts, p. 85
Weather and Fronts, p. 86
Sample Weather-Map Symbol, p. 87
Surface Observations, p. 88
GOES-8 Weather-Satellite Image, p. 89

**Science Materials
Supplied by
the Teacher**

Density Bottle from
Inv. 5, Part 1

AV Equipment

- Overhead projector

Grade 6

<p>Lesson 50 (45 min)</p> <p>Objective(s):</p> <p>Content</p> <p>Weather is the condition of the atmosphere at a specific time and location; climate is the average weather condition over a long period of time in a region.</p>	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> • General Skills: 1, 2, 3, 4, 7, 8 • Physical Setting Skills: 7, 8 • PS 2.1d, 2.1j, 2.2i 	
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide Overview, pp. 281-295 taking note of: pp. 282-285 Inv. 9 “At A Glance.” p. 295 “Why Do I Have to Learn This?” – Teacher Guide Materials & Getting Ready, pp. 311-312 taking note of p. 312 Step 1. Review Water Cycle. Drawings from Investigation 7 p. 312 Step 2. Preview Video. p. 312 Step 3 Preview the Multimedia. – Teacher Guide, Assessment, pp. 417-421. 	<p>Investigation/Activity</p> <p>Investigation 9: <i>Weather and Climate</i> Part 3: <i>Climate, Steps #1-8.</i></p> <ul style="list-style-type: none"> – Teacher Guide pp. 313-314 – Student Lab Notebook, p. 43, <i>Water-Cycle game</i> – Transparency No. 23 – The Water Planet – Video – <i>Wonders of Weather, Part 1</i> – CD-ROM/Multimedia: Climate Factors→Climate Regions – Assessment Master, p. 457: – Assessment Chart for Inv. 9, Part 9.3 Self-Assessment: Response Sheet – Weather and Climate Assessment Scoring Guide, pp. 444-445 – <i>FOSS Weather & Water Resource Book: The Water Planet</i>, pp. 45-47 <i>Is Earth Getting Warmer?</i>, pp. 63-66 	<p>Science Materials Supplied by the Teacher</p> <p>AV Equipment</p> <ul style="list-style-type: none"> • Overhead projector • Multimedia set-up for CD-ROM • VCR with monitor

Grade 6

<p>Lesson 51 (45 min)</p> <p>Objective(s):</p> <p>Content Global warming may have an effect on Earth’s weather and climate.</p> <p>Process Explain how global temperature could affect the water cycle and Earth’s climate.</p>	<p>Alignment with NYS Core Curriculum:</p> <ul style="list-style-type: none"> • General Skills: 1, 2, 3, 4, 7, 8 • Physical Setting Skills: 7, 8 • PS 2.2i, 2.2r 	
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide Overview, pp. 281-295 taking note of: pp. 282-285 Inv. 9 “At A Glance.” p. 295 “Why Do I Have to Learn This?” – Teacher Guide Materials & Getting Ready, pp. 315-316 taking note of p. 315 Step 2. Review Water Cycle Game. p. 315 Step 3 Preview the Multimedia. – Teacher Guide, Assessment, pp. 417-421. 	<p>Investigation/Activity</p> <p>Investigation 9: <i>Weather and Climate</i> Part 4: <i>Global Warming, Steps #1-8.</i></p> <ul style="list-style-type: none"> – Teacher Guide pp. 317-318 – Student Lab Notebook, p. 43, <i>Water-Cycle game</i> – Transparency No. 24 – Water-Cycle Game Tally – Special Teacher Master Nos. 11-19 – <i>Water Location Posters: Global Warming</i> – CD-ROM/Multimedia: (optional) Cycles→Water Cycle→Global Warming Rules – Assessment Master, p. 457: – <i>FOSS Weather & Water Resource Book: Water-Cycle Game Rules: Global Warming Version, p. 83 Is Earth Getting Warmer?, pp. 63-66</i> 	<p>Science Materials Supplied by the Teacher</p> <p>Chart paper Marking pens</p> <p>AV Equipment</p> <ul style="list-style-type: none"> • Overhead projector • Multimedia set-up for CD-ROM

Grade 6

<p>Lesson 52 (45 min) Objective(s): Final Summative Assessment</p>	<p>Alignment with NYS Core Curriculum:</p>	
<p>Advanced Planning/ Notes to Teachers</p> <ul style="list-style-type: none"> – Teacher Guide Overview, pp. 281-295 taking note of: pp. 282-285 Inv. 9 “At A Glance.” p. 295 “Why Do I Have to Learn This?” – Teacher Guide Materials & Getting Ready, pp. 315-316 taking note of p. 315 Step 2. Review Water Cycle Game. p. 315 Step 3 Preview the Multimedia. – Teacher Guide, Assessment, pp. 417-421. 	<p>Investigation/Activity</p> <p>Investigation 9: <i>Weather and Climate</i> Part 4: <i>Global Warming, Step #9.</i></p> <ul style="list-style-type: none"> – Teacher Guide p. 318 – Assessment Master, p. 457: – Assessment Chart for Final Summative Assessment Final Assessment, pp. 469-474 Assessment Scoring Guide, pp. 446-451 – <i>FOSS Weather & Water Resource Book: Water-Cycle Game Rules: Global Warming Version, p.83 Is Earth Getting Warmer?, pp. 63-66</i> 	<p>Science Materials Supplied by the Teacher</p> <p>AV Equipment</p>