



Issues, Evidence, and You

GRADE 6  **NORTH CAROLINA EDITION**



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ISSUES, EVIDENCE, AND YOU · GRADE 6, NORTH CAROLINA EDITION

Studying Soil Scientifically
Plate Tectonics
The Earth in Space
Exploring Space
Waves
Studying Materials Scientifically
Focus Activities

ISSUES, EVIDENCE, AND YOU · GRADE 7, NORTH CAROLINA EDITION

Body Works
Cell Biology and Disease
Genetics
Energy
Force and Motion
Weather and Atmosphere
Focus Activities

ISSUES, EVIDENCE, AND YOU · GRADE 8, NORTH CAROLINA EDITION

Water
The Chemistry of Materials
Energy
Ecology
Evolution
Bioengineering
Focus Activities

The Focus Activities contain North Carolina focus lessons for Units A, Studying Soil Scientifically and D, Exploring Space. Lessons 2A and 7A are copyright ©2015 LAB-AIDS and are used with permission. Lesson 96A is adapted from material from *EDC Earth Science*, copyright ©2014 EDC, supported by NSF grant 0439443, and is used with permission.

Additional SEPUP instructional materials include:

SEPUP Modules: Grades 6–12

Science and Sustainability: Course for Grades 9–12

Science and Global Issues—Biology: Course for High School Biology



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This student book is a compilation of SEPUP publications, customized to align to the North Carolina Essential Standards for science, Grade 6. The sequence of units provided below indicates the order that they appear in this publication. Please note that due to the nature of this compilation, unit lettering may appear out of sequence, but this will not affect the quality of the program.

From *Issues and Earth Science*:

Studying Soil Scientifically

From *Issues and Earth Science*:

Plate Tectonics

From *Issues and Earth Science*:

The Earth in Space

From *Issues and Earth Science*:

Exploring Space

From *Issues and Physical Science*:

Waves

From *Issues and Physical Science*:

Studying Materials Scientifically

Focus Activities

NORTH CAROLINA RECOMMENDED SCOPE AND SEQUENCE

The recommended scope and sequence for grade 6 is displayed in the following tables. Additional activities have been included along with an estimated instructional time that does not include assessment note-booking, or review time.

UNIT	NC STANDARD	ESTIMATED TIME
<p>Studying Soils Scientifically</p> <p>Why do plants need soil to grow? What are the differences among soils from different places? In this unit, you will learn how scientists describe and study soil. You will learn what is found in soil and how it helps crops grow. Additional kit includes study of the Rock Cycle.</p> <p><i>Issue focus:</i> Why doesn't our school garden grow plants?</p> <p>SCIENCE CONCEPTS:</p> <ul style="list-style-type: none"> • Observation • Measurement • Soil composition • Soil fertility • Rock cycle <p>This unit also includes two activities in the "Focus Activities" section at the back of the student book, numbered 2A and 7A, continuing the storyline in the Studying Soils Scientifically unit. These were developed to exactly match standards 6.I.2.2 and 6.E.2.3</p>	<p>6E.2.3 6E.2.4</p>	<p>6 weeks</p>
<p>Plate Tectonics</p> <p>What happens when a volcano erupts? Is a volcanic eruption likely to occur where you live? In this unit, you will investigate volcanoes and earthquakes. You will find out how mountains are formed. You will learn about changes to the earth's surface that takes place over very long periods of time.</p> <p><i>Issue focus:</i> Where should we store our nuclear waste?</p> <p>SCIENCE CONCEPTS:</p> <ul style="list-style-type: none"> • Earth's history • Earthquakes • Volcanoes • Plate tectonics • Earth's structure 	<p>6.E.2.1 6.E.2.2</p>	<p>6 weeks</p>

UNIT	NC STANDARD	ESTIMATED TIME
<p>Earth in Space</p> <p>In this unit, you will investigate the cause of the day-night cycle, the year, and the seasons. You will relate these changes to the motions of Earth and the Moon in space and to the way people measure time.</p> <p><i>Issue focus:</i> Why is there no such thing as a perfect calendar?</p> <p>SCIENCE CONCEPTS:</p> <ul style="list-style-type: none"> • Earth • Moon • Day and year length • Seasons • Tides • Axis Tilt 	6.E.1.1	6 weeks
<p>Exploring Space</p> <p>In this unit, you will investigate some objects in space. You will learn what size they are, and how far they are from Earth. You will learn about the ways people explore outer space—whether from Earth or from a spacecraft—and what space exploration may be like in the future.</p> <p><i>Issue focus:</i> Is manned space flight worth the cost?</p> <p>SCIENCE CONCEPTS:</p> <ul style="list-style-type: none"> • Space exploration • Telescopes • Space objects • Sun • Solar system • Gravity • Planetary motion • Remote sensing <p>This unit also includes one activity in the “Focus Activities” section at the back of the student book, numbered 96A, continuing the storyline in the Exploring Space unit. It was developed to exactly match standard 6.E.1.2</p>	6.E.1.2 6.E.1.3	6 weeks
<p>Waves</p> <p>In this unit, you will learn about several kinds of waves and investigate the transmission of sound and light. You will also investigate the situations in which some waves may be harmful to your health.</p> <p><i>Issue focus:</i> How can waves damage our hearing or eyesight?</p> <p>SCIENCE CONCEPTS:</p> <ul style="list-style-type: none"> • Wave properties • Types of waves • Sound • Light • Electromagnetic • Spectrum 	6.P.1.1 6.P.1.2 6.P.1.3 6.P.3.2	4 weeks

UNIT	NC STANDARD	ESTIMATED TIME
<p>Studying Materials Scientifically</p> <p>In this unit, you will look at how substances can be identified based on their chemical and physical properties. You will learn how to handle potentially hazardous substances with care as you study materials scientifically.</p> <p><i>Issue focus:</i> How do we safely dispose of hazardous wastes?</p> <p>SCIENCE CONCEPTS:</p> <ul style="list-style-type: none"> • Laboratory safety • Handling hazardous materials • Properties of Substances • Density • Identifying unknown solutions 	6.P.2.1	5 weeks
Total of six units	7/7 standards = meets 100%	Total of 35 weeks

NORTH CAROLINA SCIENCE STANDARDS	SEPUP	
	LOCATION: UNIT TITLE AND ACTIVITY NUMBER	TARGET ASSESSMENT QUESTIONS BY ACTIVITY
WAVES		
6.P.1 Understand the properties of waves and the wavelike property of energy in earthquakes, light and sound waves.		
6.P.1.1 Compare the properties of waves to the wave-like property of energy in earthquakes, light and sound.	Waves 91, 93, 95	93 Q1 95 Q2
6.P.1.2 Explain the relationship among visible light, the electromagnetic spectrum, and sight.	Waves 94, 95, 96, 99	94 Q6 96 Q4
6.P.1.3 Explain the relationship among the rate of vibration, the medium through which vibrations travel, sound and hearing.	Waves 89–90, 92–93	90 Q5 93 Q3, 4
MATTER: PROPERTIES AND CHANGE		
6.P.2 Understand the structure, classifications and physical properties of matter.		
6.P.2.1 Recognize that all matter is made up of atoms and atoms of the same element are all alike, but are different from the atoms of other elements.	This standard is covered in the 8th grade Water unit, Activity 36, and the 8th grade Chemistry of Materials unit, Activities 15–16, and students will master this content there.	15 Q5: UC 16 Quick Check
6.P.2.2 Explain the effect of heat on the motion of atoms through a description of what happens to particles during a change in phase.	This standard is covered in the 7th grade Weather and Atmosphere unit, Activity 60, and in the 8th grade Water unit, Activity 35 and students will master this content there.	60 Q1 35 Q5, 6
6.P.2.3 Compare the physical properties of pure substances that are independent of the amount of matter present including density, melting point, boiling point, and solubility to properties that are dependent on the amount of matter present to include volume, mass and weight.	Studying Materials Scientifically 6–10 This standard is also continued in the 8th grade Chemistry of Materials unit, Activities 14–16 and Water unit, Activity 35, where students will further master this content.	6 Q1: AD 7 Q1: AD 9 Q3: UC 10 Q1: AD 35 Q1: AD

NORTH CAROLINA SCIENCE STANDARDS	SEPUP	
	LOCATION: UNIT TITLE AND ACTIVITY NUMBER	TARGET ASSESSMENT QUESTIONS BY ACTIVITY
ENERGY: CONSERVATION AND TRANSFER		
6.P.3 Understand characteristics of energy transfer and interactions of matter and energy.		
6.P.3.1 Illustrate the transfer of heat energy from warmer objects to cooler ones using examples of conduction, radiation and convection and the effects that may result.	Plate Tectonics 46 This standard is also continued in the 7th grade Energy unit, Activities 56 and 59, and students will master this content there.	46 Q3 56 Q3 59 Q3
6.P.3.2 Explain the effects of electromagnetic waves on various materials to include absorption, scattering, and change in temperature.	Waves 96–98	97 Q5, 6 98 Q2
6.P.3.3 Explain the suitability of materials for use in technological design based on a response to heat (to include conduction, expansion, and contraction) and electrical energy (conductors and insulators).	This standard is covered in the 7th and 8th grade Energy units, Activities 60, 63, and 66–70, and students will master this content there.	60 Q1–3 63 Q4 66 Proc: DI, Q1
EARTH IN THE UNIVERSE		
6.E.1 Understand the earth/moon/sun system, and the properties, structures and predictable motions of celestial bodies in the Universe.		
6.E.1.1 Explain how the relative motion and relative position of the sun, Earth and moon affect the seasons, tides, phases of the moon, and eclipses.	Earth in Space 75–82	75 Q5 76 Q4: AD 81 Q5: UC 82 Q4: AD
6.E.1.2 Explain why Earth sustains life while other planets do not based on their properties (including types of surface, atmosphere and gravitational force) and location to the Sun.	Exploring Space 85–96 96A, Focus Activity at back of book	96A Q1–2
6.E.1.3 Summarize space exploration and the understandings gained from them.	Exploring Space 85, 93–94	94 Q1–4
EARTH SYSTEMS, STRUCTURES AND PROCESSES		
6.E.2 Understand the structure of the earth and how interactions of constructive and destructive forces have resulted in changes in the surface of the Earth over time and the effects of the lithosphere on humans.		
6.E.2.1 Summarize the structure of the earth, including the layers, the mantle and core based on the relative position, composition and density.	Plate Tectonics 38	38 Q3 Q5: UC

NORTH CAROLINA SCIENCE STANDARDS	SEPUP	
	LOCATION: UNIT TITLE AND ACTIVITY NUMBER	TARGET ASSESSMENT QUESTIONS BY ACTIVITY
6.E.2.2 Explain how crustal plates and ocean basins are formed, move and interact using earthquakes, heat flow and volcanoes to reflect forces within the earth.	Plate Tectonics 42–48	43 Proc: GI 44 Q1–3 46 Q3 48 Q4: UC
6.E.2.3 Explain how the formation of soil is related to the parent rock type and the environment in which it develops.	Studying Soils 4–7 Studying Soils 7A, Focus Activity at back of book	5 Q5: UC 6 Q3: UC 7A Q1–3
6.E.2.4 Conclude that the good health of humans requires: monitoring the lithosphere, maintaining soil quality and stewardship.	Studying Soils 1–2, 8–11	2 Q3: RE 10 Proc 11 Q2: RE, ET
STRUCTURES AND FUNCTIONS OF LIVING ORGANISMS		
6.L.1 Understand the structures, processes and behaviors of plants that enable them to survive and reproduce.		
6.L.1.1 Summarize the basic structures and functions of flowering plants required for survival, reproduction and defense.	This standard is covered in the 8th grade Ecology unit, Activity 82 and students will master this content there.	82 Q5
6.L.1.2 Explain the significance of the processes of photosynthesis, respiration, and transpiration to the survival of green plants and other organisms.	This standard is covered in the 8th grade Ecology unit, Activities 79 and 81, and students will master this content there.	79 Q2: SI 81 Q5: UC
ECOSYSTEMS		
6.L.2 Understand the flow of energy through ecosystems and the responses of populations to the biotic and abiotic factors in their environment.		
6.L.2.1 Summarize how energy derived from the sun is used by plants to produce sugars (photosynthesis) and is transferred within food chains and food webs (terrestrial and aquatic) from producers to consumers to decomposers.	This standard is covered in the 8th grade Ecology unit, Activities 78–81, and students will master this content there.	78 Q2 79 Q2 80 Q2–3
6.L.2.2 Explain how plants respond to external stimuli (including dormancy and forms of tropism) to enhance survival in an environment.	Studying Soils 2A, Focus Activity at back of book	2A Q1
6.L.2.3 Summarize how the abiotic factors (such as temperature, water, sunlight, and soil quality) of biomes (freshwater, marine, forest, grasslands, desert, Tundra) affect the ability of organisms to grow, survive and/or create their own food through photosynthesis.	This standard is covered in the 8th grade Ecology unit, Activities 81–83, and students will master this content there.	83 Q2