



# Issues, Evidence, and You

**GRADE 7**  **NORTH CAROLINA EDITION**





# Issues, Evidence, and You

GRADE 7  NORTH CAROLINA EDITION



THE LAWRENCE  
HALL OF SCIENCE  
UNIVERSITY OF CALIFORNIA, BERKELEY



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

Studying Soil Scientifically  
Plate Tectonics  
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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 Activity

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

The Chemistry of Materials  
Water  
Energy  
Ecology  
Evolution  
Bioengineering  
Focus Activities

The Focus Activity is a North Carolina focus lesson for Unit D, Energy. Focus Activity 55A is copyright ©2015 LAB-AIDS 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



This material is based upon work supported by the National Science Foundation under Grant No. 0099265. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.

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The preferred citation format for this book is SEPUP. (2015). *Issues, Evidence, and You, Grade 7, North Carolina Edition*. Lawrence Hall of Science, University of California at Berkeley. Published by Lab-Aids®, Inc., Ronkonkoma, NY.

1 2 3 4 5 6 7 8 9                      19 18 17 16 15

©2015 The Regents of the University of California  
ISBN+13: 978-1-63093-252-7

**SEPUP**  
Lawrence Hall of Science  
University of California at Berkeley  
Berkeley CA 94720-5200

e-mail: [sepup@berkeley.edu](mailto:sepup@berkeley.edu)  
Website: [www.sepuplhs.org](http://www.sepuplhs.org)



17 Colt Court  
Ronkonkoma NY 11779  
Website: [www.lab-aids.com](http://www.lab-aids.com)

This student book is a compilation of SEPUP publications, customized to align to the North Carolina Essential Standards for science, Grade 7. 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 within each unit the page numbering is consistent.

*From Issues and Life Science:*

## **Body Works**

*From Issues and Life Science:*

## **Cell Biology and Disease**

*From Issues and Life Science:*

## **Genetics**

*From Issues and Physical Science:*

## **Energy**

*From Issues and Physical Science:*

## **Force and Motion**

*From Issues and Earth Science:*

## **Weather and Atmosphere**

## **Focus Activity**



# NORTH CAROLINA RECOMMENDED SCOPE AND SEQUENCE

The recommended scope and sequence for grade 7 is displayed in the following tables. Additional activities have been included along with an estimated instructional time that does not include assessment, note-taking, or review time.

UNIT	NC STANDARD	ESTIMATED TIME
<p><b>Body Works</b>            What choices do you make about your health every day? Which of these decisions may affect your health in the future? In this unit, you will learn more about your body and how it works.</p> <p>In select activities from our Cell Biology unit, you will compare the structures and life functions of single celled organisms; compare structures and functions of plant and animal cells; and summarize the hierarchical organization of multi-cellular organisms from cells to tissues to organs to systems to organisms.</p> <p><i>Issue Focus:</i> How do our choices affect our cardiovascular health?</p> <p><b>SCIENCE CONCEPTS:</b></p> <ul style="list-style-type: none"> <li>• Body systems</li> <li>• Structure and function</li> <li>• Cardiovascular disease</li> <li>• Modeling</li> <li>• Cell structure and function</li> </ul>	7.L.1.1 7.L.1.2 7.L.1.3 7.L.1.4	6 weeks
<p><b>Cell Biology and Disease</b>            In the Cell Biology unit, you will explore what causes infectious diseases, how these diseases are transmitted, and how medicine is used to combat them.</p> <p><i>Issue Focus:</i> How do we spread contagious disease?</p> <p><b>SCIENCE CONCEPTS:</b></p> <ul style="list-style-type: none"> <li>• Microscopy</li> <li>• Cell structure and function</li> <li>• Microbes</li> <li>• Disease</li> <li>• Antibiotic resistance</li> <li>• Emerging disease</li> <li>• Science and technology</li> </ul>	7.L.1.1 7.L.1.2	9 weeks

UNIT	NC STANDARD	ESTIMATED TIME
<p><b>Genetics</b></p> <p>Have you ever wondered why some children look very much like their biological parents while others look completely different? Why doesn't a child look like a simple blend of his or her parents? Why do some siblings look so different?</p> <p>In this unit, you will begin to find answers to these questions. Because many of the same principles apply to all organisms, you will study humans and other organisms as well.</p> <p><i>Issue Focus:</i> Should we use DNA information to establish kinship?</p> <p><b>SCIENCE CONCEPTS:</b></p> <ul style="list-style-type: none"> <li>• Asexual and sexual reproduction</li> <li>• Heredity</li> <li>• Probability</li> <li>• Nature and nurture</li> <li>• DNA finger-printing</li> </ul>	<p>7.L.2.1 7.L.2.2 7.L.2.3</p>	<p>7 weeks</p>
<p><b>Energy*</b></p> <p>In this unit, you will learn about the transfer and transformation of energy in our everyday lives. By exploring how energy can be used more efficiently at home, you will learn the answers to some puzzling questions: Where does all the energy around us come from? Are there different types? Does it ever run out? How does it get from one place to another?</p> <p><i>Issue Focus:</i> How can I design an energy-efficient home?</p> <p><b>SCIENCE CONCEPTS:</b></p> <ul style="list-style-type: none"> <li>• Energy transfer and transformation</li> <li>• Types of energy</li> <li>• Electrical currents</li> <li>• Motors and generators</li> <li>• Magnetic fields</li> <li>• Measuring efficiency</li> <li>• Energy efficiency</li> <li>• Mechanical Advantage</li> </ul> <p>This unit includes one activity in the Focus Activity section at the back of the student book. Activity 55A continues the storyline in the Energy unit, and was developed to exactly match standard 7.P.2.4.</p> <p><small>*The Energy unit appears in both the 7th and 8th grade programs, to meet NCES instructional requirements.</small></p>	<p>7.P.2.1 7.P.2.2 7.P.2.3 7.P.2.4</p>	<p>5 weeks</p>



UNIT	NC STANDARD	ESTIMATED TIME
<p><b>Force and Motion</b></p> <p>How are forces related to motion? How does the size of something affect how it moves?</p> <p>In this unit, you will learn how forces affect the motion of an object. By examining car collisions, you will also learn how an understanding of motion can improve safety on the road.</p> <p><i>Issue focus:</i> What are the costs of making safer automobiles?</p> <p><b>SCIENCE CONCEPTS:</b></p> <ul style="list-style-type: none"> <li>• Newton's laws</li> <li>• Inertia</li> <li>• Force</li> <li>• Friction</li> <li>• Experimental design</li> <li>• Automobile safety</li> </ul>	<p>7.P.1.1 7.P.1.2 7.P.1.3 7.P.1.4</p>	<p>6 weeks</p>
<p><b>Weather and Atmosphere</b></p> <p>Weather affects what you wear, what you do every day, and even how you get from place to place. But do you know why it rains in some parts of the United States more than others? How would weather scientists describe the patterns of weather we experience each year? In this unit you will analyze weather, climate, and factors that affect weather and climate through the eyes of scientists who study the earth's weather and atmosphere.</p> <p><i>Issue focus:</i> How could we get better at long-term weather forecasting?</p> <p><b>SCIENCE CONCEPTS:</b></p> <ul style="list-style-type: none"> <li>• Weather</li> <li>• Climate</li> <li>• Atmosphere</li> <li>• Water cycle</li> <li>• Oceans</li> <li>• Clouds</li> <li>• Sun as a source of energy</li> </ul>	<p>7.E.1.1 7.E.1.2 7.E.1.3 7.E.1.4 7.E.1.5 7.E.1.6</p>	<p>5 weeks</p>
<p>Total of six units</p>	<p>5/5 standards=meets 100%</p>	<p>Total of 38 weeks</p>

NORTH CAROLINA SCIENCE STANDARDS	SEPUP	
	LOCATION: UNIT TITLE AND ACTIVITY NUMBER	TARGET ASSESSMENT QUESTIONS BY ACTIVITY
<b>FORCES AND MOTION</b>		
7.P.1 Understand motion, the effects of forces on motion and the graphical representations of motion.		
7.P.1.1 Explain how the motion of an object can be described by its position, direction of motion, and speed with respect to some other object.	Force & Motion 74–76	74 Proc 75 Q2: UC
7.P.1.2 Explain the effects of balanced and unbalanced forces acting on an object (including friction, gravity and magnets).	Force & Motion 80–84	80 Q2: UC 82 Q3: RE 83 Q6: AD
7.P.1.3 Illustrate the motion of an object using a graph to show a change in position over a period of time.	Force & Motion 78	78 Q1–2
7.P.1.4 Interpret distance versus time graphs for constant speed and variable motion.	Force & Motion 75	75 Q4, 5
<b>ENERGY: CONSERVATION AND TRANSFER</b>		
7.P.2 Understand forms of energy, energy transfer and transformation and conservation in mechanical systems.		
7.P.2.1 Explain how kinetic and potential energy contribute to the mechanical energy of an object.	Energy 54, 55, 57, 58	55 Q1: UC
7.P.2.2 Explain how energy can be transformed from one form to another (specifically potential energy and kinetic energy) using a model or diagram of a moving object (roller coaster, pendulum, or cars on ramps as examples).	Energy 54–60	55 Q3 56 Q4 57 Q3: UC 58 Q2: UC 59 Q3
7.P.2.3 Recognize that energy can be transferred from one system to another when two objects push or pull on each other over a distance (work) and electrical circuits require a complete loop through which an electrical current can pass.	Energy 66 Energy 55A, Parts 1–3. Focus Activity at back of book	66 Proc: DI 55A part 2 Q2–8 part 3 Q2, 4, 5
7.P.2.4 Explain how simple machines such as inclined planes, pulleys, levers and wheel and axles are used to create mechanical advantage and increase efficiency.	Energy 55A, Parts 1–3. Focus Activity at back of book	55A Part 1 Q1–7 Part 2 Q1–8 Part 3 Q1–5

NORTH CAROLINA SCIENCE STANDARDS	SEPUP	
	LOCATION: UNIT TITLE AND ACTIVITY NUMBER	TARGET ASSESSMENT QUESTIONS BY ACTIVITY
<b>EARTH SYSTEMS, STRUCTURES AND PROCESSES</b>		
7.E.1 Understand how the cycling of matter (water and gases) in and out of the atmosphere relates to Earth's atmosphere, weather and climate and the effects of the atmosphere on humans.		
7.E.1.1 Compare the composition, properties and structure of Earth's atmosphere to include: mixtures of gases and differences in temperature and pressure within layers.	Weather & Atmosphere 63–66	66 Q2: UC
7.E.1.2 Explain how the cycling of water in and out of the atmosphere and atmospheric conditions relate to the weather patterns on Earth.	Weather & Atmosphere 62	62 Q1
7.E.1.3 Explain the relationship between the movement of air masses, high and low pressure systems, and frontal boundaries to storms (including thunderstorms, hurricanes, and tornadoes) and other weather conditions that may result.	Weather & Atmosphere 58, 69	69 Proc: CS
7.E.1.4 Predict weather conditions and patterns based on information obtained from: <ul style="list-style-type: none"> <li>• Weather data collected from direct observations and measurement (wind speed and direction, air temperature, humidity and air pressure)</li> <li>• Weather maps, satellites and radar</li> <li>• Cloud shapes and types and associated elevation</li> </ul>	Weather & Atmosphere 50–51, 69	51 Q2, Q3 69 Q1
7.E.1.5 Explain the influence of convection, global winds and the jet stream on weather and climatic condition	Weather & Atmosphere 58, 67–68	67 Proc: DI 68 Q2
7.E.1.6 Conclude that the good health of humans requires: monitoring the atmosphere, maintaining air quality and stewardship.	Weather & Atmosphere 70	70 Q1–3

NORTH CAROLINA SCIENCE STANDARDS	SEPUP	
	LOCATION: UNIT TITLE AND ACTIVITY NUMBER	TARGET ASSESSMENT QUESTIONS BY ACTIVITY
<b>STRUCTURES AND FUNCTIONS OF LIVING ORGANISMS</b>		
7.L.1 Understand the processes, structures and functions of living organisms that enable them to survive, reproduce and carry out the basic functions of life.		
7.L.1.1 Compare the structures and life functions of single-celled organisms that carry out all of the basic functions of life including: <ul style="list-style-type: none"> <li>• Euglena</li> <li>• Amoeba</li> <li>• Paramecium</li> <li>• Volvox</li> </ul>	Cell Biology & Disease 36–38, 43	38 Q1 43 Q5: UC
7.L.1.2 Compare the structures and functions of plant and animal cells, including major organelles (cell membrane, cell wall, nucleus, chloroplasts, mitochondria, and vacuoles).	Cell Biology & Disease 38–42	38 Q2 39 Q2: AD, SI 42 Q1–5
7.L.1.3 Summarize the hierarchical organization of multicellular organisms from cells to tissues to organs to systems to organisms..	Body Works 12  Cell Biology & Disease 42	12 Q5, 6
7.L.1.4 Summarize the general functions of the major systems of the human body (digestion, respiration, reproduction, circulation, and excretion) and ways that these systems interact with each other to sustain life.	Body Works 13, 15–18	15 Q3: UC 16 Q6–7: UC 17Proc: OD 18 Q5: SI
<b>EVOLUTION AND GENETICS</b>		
7.L.2 Understand the relationship of the mechanisms of cellular reproduction, patterns of inheritance and external factors to potential variation among offspring.		
7.L.2.1 Explain why offspring that result from sexual reproduction (fertilization and meiosis) have greater variation than offspring that result from asexual reproduction (budding and mitosis).	Genetics 57, 63, 65	57 Q1–2
7.L.2.2 Infer patterns of heredity using information from Punnett squares and pedigree analysis. and volcanoes to reflect forces within the earth.	Genetics 61–62, 66	62 Q5 66 Q1–4
7.L.2.3 Explain the impact of the environment and lifestyle choices on biological inheritance (to include common genetic diseases) and survival.	Genetics 64–66	66 Q5