

Berkeley County Schools
Grade 8 Curriculum Map

All Nine Weeks (embedded throughout the year)

College and Career Readiness Indicators for Science Standards	Topic(s) Addressed	Textbook Location	Suggested Labs, Activities, and Hyperlinks
Nature of Science	<ul style="list-style-type: none"> • Scientific knowledge is simultaneously reliable and subject to change based on empirical evidence and interpretation. • Scientific knowledge is obtained through a combination of observations of the natural world and inferences based on those observations. • Science is a creative human endeavor which is influenced by social and cultural biases. • A primary goal of science is the formation of theories and laws. Theories are inferred explanations of some aspects of the natural world based on successfully tested information from evidence and evaluated phenomena. Laws describe relationships among what has been observed in the natural world. • Scientific investigations use a variety of methods to address questions about the natural and material world. 	No defined location; these topics are woven into the practice of science but should also be taught explicitly whenever possible.	<ul style="list-style-type: none"> • Use SyncBlast articles related to your topic of study to spark curiosity and discussion about the nature of science. • Video Link: as a springboard for discussion about Nature of Science
Practices of Scientists and Engineers	<ul style="list-style-type: none"> • Asking questions and defining problems. • Developing and using models. • Planning and carrying out investigations. • Analyzing and interpreting data. • Using mathematical and computational thinking. • Constructing explanations and designing solutions. • Engaging in argument from evidence • Obtaining, evaluation, and communicating information. 	Module Planning Resources (for each Module)	In your Module Planning Resources (orange sections, teacher's edition), go to Three Dimensions at a Glance to see how these practices are integrated into the book's lessons.
Science Connecting Concepts	<ul style="list-style-type: none"> • Observing patterns. • Investigating and explaining cause and effect. • Recognizing scale, proportion, and quantity. • Defining systems and system models. 	Module Planning Resources (for each Module)	In your Module Planning Resources (orange sections, teacher's edition), go to Three Dimensions at a Glance to see

	<ul style="list-style-type: none"> Tracking energy and matter flows, into, out of, and within systems to understand system behavior. Determining the relationships between structure and function. Studying stability and change. 		how these practices are integrated into the book's lessons.
Science Literacy	<ul style="list-style-type: none"> Producing clear and coherent technical writing in which the development, organization, and style are appropriate for the science topic. Correctly utilizing and explaining visually expressed information (e.g., flowchart, diagram, model, graph, table, and digital mapping technology) in a science narrative. Appropriately using technical terminology or scientific concepts and processes to create visually expressed information. Reading with understanding articles about science in the popular press and engaging in social conversation about validity of the conclusions. 	Resources within each lesson	Each lesson begins with a graphic organizer ("Explain the Phenomenon") for claim-evidence-reasoning writing for the content.
Science Lab Safety	<ul style="list-style-type: none"> Requiring student lab safety training and demonstrating appropriate proficiency before participating in lab activities. Archiving signed student safety contracts documenting lab safety training and medical contraindications (e.g., allergies, contact lenses, and medical conditions). Wearing proper protective gear as needed (e.g., goggles, apron, and gloves). Using and following SDS protocols. Storing and disposing of chemical/biological materials properly. 	See online textbook resources	Go to Online Course, click on Courses, got to Learning Resources, use information on Lab Safety, etc.

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1st Nine Weeks

Standard	Topic(s) Addressed	Textbook Location	Suggested Labs, Activities, and Hyperlinks
Engineering, Technology, and Applications of Science			
S.8.18 evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. S.8.19 develop a model to generate data for interactive testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.	<ul style="list-style-type: none"> • Scientific method • Engineering design • Lab Safety 	<ul style="list-style-type: none"> • Volume 1, Matter: Properties and Changes, & Materials Science • Volume 2, Reproduction of Organisms 	<ul style="list-style-type: none"> • Pages 168-171 “Changing the Energy” • Pages 177-182 “STEM Module Project: “Engineering Challenge” • Go to Online Course, click on Courses, go to Program Resources, got to Learning Resources, use information on Lab Safety, etc.
Structure and Properties of Matter			
S.8.12 Gather and make sense of information to describe that synthetic materials come from natural resources and impact society	<ul style="list-style-type: none"> • How does the structure and function of materials influence how synthetic materials are made? 	<ul style="list-style-type: none"> • Volume 1, Materials Science Module 	<ul style="list-style-type: none"> • Reference page 184G (Teacher’s Edition Volume 1) • **Lesson 2: Virtual Lab: “How much landfill space can be saved in a year by recycling?” • Corn Plastic Lab
S.8.13 Develop model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed	<ul style="list-style-type: none"> • How does the structure of a substance and the energy of its particles relate to its properties in different states of matter? • What effect does changing temperature have on substances? 	<ul style="list-style-type: none"> • Volume 1, Classification and States of Matter Module, Lessons 1 & 2 	<ul style="list-style-type: none"> • Reference page 2G (Teacher’s Edition Volume 1), Lessons 1 and 2 • **Lesson 1: PhET Interactive Simulation: States of Matter: Basics • **Lesson 2: Virtual Lab: “How does thermal energy affect the state of a substance?” • Changes of State Lab

**Go to Online Course -> Module Name -> Lesson # -> Lesson Library

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2nd Nine Weeks

Standard	Topic(s) Addressed	Textbook Location	Suggested Labs, Activities, and Hyperlinks
Chemical Reactions			
S.8.14 Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred	<ul style="list-style-type: none"> How can you use properties to identify a substance? 	<ul style="list-style-type: none"> Volume 1, Matter: Properties and Changes 	<ul style="list-style-type: none"> Reference Page 106G & 106H (Teacher's Edition, Volume 1) Lesson 1 and 2 ** Lesson 1 Library, Virtual Lab: "Properties of Elements" **Lesson 2 Library, Virtual Lab: "Understanding Matter" Chemical Changes Lab
S.8.15 Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved	<ul style="list-style-type: none"> How do atoms rearrange to form new substances in a chemical reaction (e.g., Law of Conservation of Matter)? 	<ul style="list-style-type: none"> Volume 1, Matter: Properties and Changes 	<ul style="list-style-type: none"> Reference Pages 106G & 106H (Teacher's Edition, Volume 1) Lesson 2 **Lesson 2 Library, Virtual Lab: "Investigation: Trading Places" Conservation of Mass Lab
S.8.16 Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes	<ul style="list-style-type: none"> Why do some reactions give off thermal energy and some absorb thermal energy? 	<ul style="list-style-type: none"> Volume 1, Matter: Properties and Changes 	<ul style="list-style-type: none"> Reference Page 106G and 106H (Teacher's Edition, Volume 1) Lesson 3 & STEM Module Project ** Lesson 3 Library, Virtual Lab: "Energy In, Energy Out" Reactions and Engineering Lab
S.8.17 Construct an argument supported by evidence for how increases in human populations and per-capita consumption of natural resources impact Earth's systems	<ul style="list-style-type: none"> How does a growing human population affect consumption of resources? How does resource consumption affect the environment (land water, and atmosphere)? 	<ul style="list-style-type: none"> Volume 2: Earth and Human Activity 	<ul style="list-style-type: none"> Reference Page 440G and 440H (Teacher's Edition Volume 2) Lesson 1 and 2. **Lesson 1 Library, Virtual Lab: "Bean There, Done That" **Lesson 2 Library, Virtual Lab: "What Are the Advantages of Alternate Energy Sources" Global Population, Box by Box Human Impacts on Earth Systems

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3rd Nine Weeks

Standard	Topic(s) Addressed	Textbook Location	Suggested Labs, Activities, and Hyperlinks
Growth, Development, and Reproduction of Organisms			
S.8.3 Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of an organism	<ul style="list-style-type: none"> How do changes to genetic material alter proteins and, thereby, traits? 	<ul style="list-style-type: none"> Volume 2, Module: Natural Selection and Adaptation 	<ul style="list-style-type: none"> Reference Page 324G and 324H (Teacher's Edition, Volume 2) Lesson 1, Lesson 2, and "STEM Module Project: Evidence of Evolution" **Lesson 1: Virtual Investigation: DNA and Genes Mutations lab (requires free account) Mutations video
S.8.4 Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation	<ul style="list-style-type: none"> How do plants reproduce and grow (sexual and asexual reproduction, Punnett squares, Dominant vs. Recessive traits)? 	<ul style="list-style-type: none"> Volume 2, Module: Reproduction of Organisms 	<ul style="list-style-type: none"> Reference Page 236G and 236H (Teacher's Edition, Volume 2) Lesson 1, Lesson 2, and "STEM Module Project: Get Your Game Face On" ** Lesson 1: Virtual Investigation: Punnett Squares (Found in Module: Reproduction of Org.) Interactive examples
S.8.5 Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms	<ul style="list-style-type: none"> How can humans selectively alter the traits of organisms (selective breeding, genetic engineering)? 	<ul style="list-style-type: none"> Volume 2, Module: Natural Selection and Adaptation 	<ul style="list-style-type: none"> Reference Page 324H (Teacher's Edition, Volume 2) Lesson 3 ** Lesson 1: LAB: Beetle Genes (Found in Module: Reproduction of Org.) Pigeon Breeding: Genetics at Work
Natural Selection and Adaptations			
S.8.9 Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individual's probability of surviving and reproducing in a specific environment	<ul style="list-style-type: none"> How can a variation in a population result in an adaptation? 	<ul style="list-style-type: none"> Volume 2, Module: Natural Selection and Adaptation 	<ul style="list-style-type: none"> Reference Page 324G and 324H (Teacher's Edition, Volume 2) Lesson 2 and "STEM Module Project: Evidence of Evolution" **Lesson 2: Virtual Investigation: How are fish adapted to their environment? Pocket Mouse (requires free account)

<p>S.8.10 Use mathematical models, probability statements, and proportional reasoning to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.</p>	<ul style="list-style-type: none"> • How can a variation of traits in a population result in changes to that population? 	<ul style="list-style-type: none"> • Volume 2, Module: Natural Selection and Adaptation 	<ul style="list-style-type: none"> • Reference Page 324H (Teacher's Edition, Volume 2) "STEM Module Project: Evidence of Evolution" • **Lesson 2: Virtual Investigation: Natural Selection • Peppered Moth (requires free account)
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4th Nine Weeks

Standard	Topic(s) Addressed	Textbook Location	Suggested Labs, Activities, and Hyperlinks
Growth, Development, and Reproduction of Organisms			
S.8.1 Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively	<ul style="list-style-type: none"> • How are traits passed from one generation to the next? • How do multicellular organisms reproduce? 	<ul style="list-style-type: none"> • Volume 2, Module: Reproduction of Organisms 	<ul style="list-style-type: none"> • Reference Page 236G (Teacher's Edition Volume 2) Lesson 1 and 2 • ** Lesson 1 Virtual Investigation: Sex-Linked Traits • ** Lesson #4 Virtual Lab: What are the functions of the parts of a flower? • Asexual vs Sexual Cellular Reproduction
S.8.2 Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms	<ul style="list-style-type: none"> • How do genetic and environmental factors affect reproduction and animal growth? • How do plants reproduce and grow? 	<ul style="list-style-type: none"> • Volume 2, Module: Reproduction of Organisms 	<ul style="list-style-type: none"> • Reference Page 236H (Teacher's Edition Volume 2) Lesson 3 and 4, Stem Module Project "Get Your Game Face On" • ** Lesson 3 Virtual Lab: Virtual Investigation: Mealworm Behavior • ** Lesson 4 Virtual Lab: Which colors of the light spectrum are most important for plant growth? • Environment and Genetic Factors and Growth
Natural Selection and Adaptations			
S.8.6 Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past	<ul style="list-style-type: none"> • What can fossils tell us about evolution (diversity, extinction)? 	<ul style="list-style-type: none"> • Volume 2, Module: Evidence of Evolution 	<ul style="list-style-type: none"> • Reference Page 396H (Teacher's Edition, Volume 2) Lesson 1 and "STEM Module Project: It's all Relative" • ** Lesson 1 Virtual Lab: Dino Dig and Simulation: Fossil Dig • The Fossil Record
S.8.7 Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships	<ul style="list-style-type: none"> • What evidence for evolution can living organisms provide (e.g., comparative anatomy)? 	<ul style="list-style-type: none"> • Volume 2, Module: Evidence of Evolution 	<ul style="list-style-type: none"> • Reference Page 396H (Teacher's Edition, Volume 2) Lesson 2 and "STEM Module Project: It's all Relative" • ** Lesson 2 Interactive: Winging It and LAB: Spoon Something Up

			<ul style="list-style-type: none"> • Comparative Anatomy • Vestigial Structures video
S.8.8 Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy	<ul style="list-style-type: none"> • What are some similarities in embryological development across species? 	<ul style="list-style-type: none"> • Volume 2, Module: Evidence of Evolution 	<ul style="list-style-type: none"> • Reference Page 396H (Teacher's Edition, Volume 2) Lesson 2 and "STEM Module Project: It's all Relative" • ** Lesson 2 Virtual Lab: Classifying Using Biotechnology • Embryos, Animals, and Evolution (requires free account)

**Go to Online Course -> Module Name -> Lesson # -> Lesson Library