

**Shelby County
Curriculum Pacing Guide
Honors Biology**

Textbook: Biology – Prentice Hall “Biology - Life on Earth”

Content	Standard	AHSGE Objective	Textbook Section	Suggested Resources	Suggested Teaching Date	Date(s) Taught
Science As a Process	1. Select appropriate laboratory glassware, balances, time measuring equipment, and optical instruments to conduct an experiment. 1a. Describing the steps of the scientific method 1b. Comparing controls, dependent variables, and independent variables 1c. Identifying safe laboratory procedures when handling chemicals and using Bunsen burners and laboratory glassware 1d. Using appropriate SI units for measuring length, volume, and mass	I-1	Chap 1 section 3 pages 8-11	Safety Video, Scientific Method lab: ASIM – Measuring and Pipeting Scientific method with the Simpsons	All year	
Introduction to Chemistry and Biochemistry	Chemistry Review Review basic properties of matter and chemical bonding • Unique properties of water • Importance of enzymes in chemical reactions for living organisms 2c. Explaining how temperature, light, and pH affect cellular activities 2. Describe cell processes necessary for achieving homeostasis, including active and passive transport, osmosis, diffusion, exocytosis, and endocytosis. 2a. Identifying functions of carbohydrates, lipids, proteins, and nucleic acids in cellular activities	II-2,3,4	Chap 2 Pages 20 – 33	Properties of water lab Bubble lab Video – Surface Tension Enzyme lab	1 st Nine Weeks	
Cells	4. Describe similarities and differences of cell organelles, using diagrams and tables. 4a. Identifying scientists who contributed to the cell theory Examples: Hooke, Schleiden, Schwann, Virchow, van Leeuwenhoek 4b. Distinguishing between prokaryotic and eukaryotic cells 4c. Identifying various technologies used to observe cells Examples: light microscope, scanning electron microscope, transmission electron microscope	V-1	Chap 5 Pages 74-95	Cell Analogy Poster Virtual Cell Lab		
Cells	5. Identify cells, tissues, organs, organ systems, organisms, populations, communities, and ecosystems as levels of organization in the biosphere. 5a. Recognizing that cells differentiate to perform specific functions Examples: ciliated cells to produce movement, nerve cells to conduct electrical charges	VI-1	Chap27 section 1 Pages 536 - 538	Observation of cells lab - Microscope		
Cells	3. Identify the reactants and products associated with photosynthesis and cellular respiration and the purposes of these two processes.	V-1	Chapters 7 & 8 Pages 114 - 143	Lab: Observing Elodea -AP Lab#4 Part A Chromotography of Leaves Observing chloroplast and stomata		

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Cells	<p>2. Describe cell processes necessary for achieving homeostasis, including active and passive transport, osmosis, diffusion, exocytosis, and endocytosis.</p> <p>2b. Comparing the reaction of plant and animal cells in isotonic, hypotonic, and hypertonic solutions</p> <p>2d. Applying the concept of fluid pressure to biological systems Examples: blood pressure, turgor pressure, bends, strokes</p>	V-1	Chap 4 Pages 56 - 71	Food Label Excel spreadsheet and analysis Osmosis scenerios AP Lab#1 Part A and C- Osmosis/Diffusion Movement across membranes cartoons	1 st Nine Weeks	
Cells and Heredity	<p>6. Describe the roles of mitotic and meiotic divisions during reproduction, growth, and repair of cells.</p> <p>2a. Explaining how surface area and cell size affect cellular activities</p> <ul style="list-style-type: none"> • Outline the sequence of events in mitosis and meiosis • Compare and contrast both types of nuclear division <p>6a. Comparing sperm and egg formation in terms of ploidy Example: ploidy—haploid, diploid</p> <p>6b. Comparing sexual and asexual reproduction</p>	V-2	Chap 11 Pages 184 - 205	ASIM lab – “Why must cells be small?” AP Lab#3 part A- Cell cycle AP Lab #3 part B- Mitosis/ Meiosis simulation kit Mitosis and Meiosis flip books Division Comparative poster project		
Heredity	<p>7. Apply Mendel’s law to determine phenotypic and genotypic probabilities of offspring.</p> <p>7a. Defining important genetic terms, including monohybrid cross, phenotype, genotype, homozygous, heterozygous, dominant trait, recessive trait, incomplete dominance, codominance, and allele</p> <p>7b. Interpreting inheritance patterns shown in graphs and charts</p> <p>7c. Calculating genotypic and phenotypic percentages and ratios using a Punnett square</p>	IV-1	Chap 12 Pages 208 - 234	Family Genetics Project, Candy Genetics, Punnett squares worksheets Alcaptonuria Lab Blue People of Troublesome Creek Case Study “I’m my own grandpa” pedigree analysis genetic disorder presentation	2 nd Nine Weeks	

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Heredity	<p>8. Identify the structure and function of DNA, RNA, and protein.</p> <ul style="list-style-type: none"> • History of the discovery of DNA structure and function 8a. Explaining relationships among DNA, genes, and chromosomes 8b. Listing significant contributions of biotechnology to society, including agricultural and medical practices Examples: DNA fingerprinting, insulin, growth hormone 8c. Relating normal patterns of genetic inheritance to genetic variation Example: crossing-over 8d. Relating ways chance, mutagens, and genetic engineering increase diversity Examples: insertion, deletion, translocation, inversion, recombinant DNA 8e. Relating genetic disorders and disease to patterns of genetic inheritance Examples: hemophilia, sickle cell anemia, Down’s syndrome, Tay-Sachs disease, cystic fibrosis, color blindness, phenylketonuria (PKU) 	<p>IV-2</p> <p>IV-1</p>	<p>Chap 9 and 10</p> <p>Pages 148 - 180</p>	<p>Video – “Race for the Double Helix”</p> <p>DNA extraction</p> <p>DNA fingerprinting Lab</p> <p>Protein synthesis sentences</p> <p>Genetic engineering current events</p> <p>Bioethical issue research paper</p> <p>GATTACA video</p>	2 nd Nine Weeks	
Taxonomy and Survey of Kingdoms (1st 3)	<p>9. Differentiate between the previous five-kingdom and current six-kingdom classification systems.</p> <ul style="list-style-type: none"> 9a. Sequencing taxa from most inclusive to least inclusive in the classification of living things 9b. Identifying organisms using a dichotomous key 9c. Identifying ways in which organisms from the Monera, Protista, and Fungi kingdoms are beneficial and harmful Examples: beneficial—decomposers, harmful—diseases 9d. Justifying the grouping of viruses in a category separate from living things 9e. Writing scientific names accurately by using binomial nomenclature 	III-1	<p>Chap 18</p> <p>Pages 344 – 355</p> <p>Chap 19- 20</p> <p>Pages 358 - 386</p>	<p>Venn diagrams</p> <p>dichotomous keys</p> <p>Bacterial inhibition Lab</p> <p>protist lab</p>	3 rd Nine Weeks	
Plants	<p>10. Distinguish between monocots and dicots, angiosperms and gymnosperms, and vascular and nonvascular plants.</p> <ul style="list-style-type: none"> • Describe the evolutionary history of plants on earth 10a. Describing the histology of roots, stems, leaves, and flowers 10b. Recognizing chemical and physical adaptations of plants Examples: chemical—foul odor, bitter taste, toxicity; physical—cactus spines, needles, broad leaves 	III-2	<p>Chap 21</p> <p>Pages 404 – 419</p> <p>Chap 24 –26</p> <p>Pages 464 - 529</p>	<p>Flower dissection</p> <p>Peanut dissection</p>		

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Animals	<p>11. Classify animals according to type of skeletal structure, method of fertilization and reproduction, body symmetry, body coverings, and locomotion.</p> <p>Examples: skeletal structure—vertebrates, invertebrates; fertilization—external, internal; reproduction—sexual, asexual; body symmetry—bilateral, radial, asymmetrical; body coverings—feathers, scales, fur; locomotion—cilia, flagella, pseudopodia</p>	III-3	Chapter 22 - 23 Pages 422 - 460	Dissections – frog, pig, fish, and earthworm animal phyla graphic organizer comparative survey of body systems piñata project insect collection	4 th Nine Weeks	
Animals and Ecology	<p>Explain the theory of evolution</p> <ul style="list-style-type: none"> • Relate the scientific method to the theory of evolution • Differentiate between theory, law, hypothesis • Describe the current evidence for evolution • Explain the mechanisms of natural selection • Recognize the variety of ways in which populations evolve • Describe the mechanisms of macroevolution • Outline the history of the earth and the fossil record <p>12. Describe protective adaptations of animals, including mimicry, camouflage, beak type, migration, and hibernation.</p> <p>12a. Identifying ways in which the theory of evolution explains the nature and diversity of organisms</p> <p>12b. Describing natural selection, survival of the fittest, geographic isolation, and fossil record</p>	VI-1	Chap 14 - 16 Pages 264 - 313	Scientific evidence box activity Video – Evolutions Voice Natural selection lab AP lab #8 – Hardy Weinberg lab Geologic time scale activity Grab for grub lab		

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Ecology/Biomes	<p>13. Trace the flow of energy as it decreases through the trophic levels from producers to the quaternary level in food chains, food webs, and energy pyramids.</p> <p>13a. Describing the interdependence of biotic and abiotic factors in an ecosystem Examples: effects of humidity on stomata size, effects of dissolved oxygen on fish respiration</p> <p>13b. Contrasting autotrophs and heterotrophs</p> <p>13c. Describing the niche of decomposers</p> <p>13d. Using the ten percent law to explain the decreasing availability of energy through the trophic levels</p>	II-1	Chap 41 Section 1 & 2 Pages 840 - 847	Create food chains create food webs	4 th Nine Weeks	
Ecology/Biomes	<p>14. Trace biogeochemical cycles through the environment, including water, carbon, oxygen, and nitrogen.</p> <p>14a. Relating natural disasters, climate changes, nonnative species, and human activity to the dynamic equilibrium of ecosystems Examples: natural disasters—habitat destruction resulting from tornadoes; climate changes—changes in migratory patterns of birds; nonnative species—exponential growth of kudzu and Zebra mussels due to absence of natural controls; human activity—habitat destruction resulting in reduction of biodiversity, conservation resulting in preservation of biodiversity</p> <p>14b. Describing the process of ecological succession</p>	VI-1	Chap 41 Section 3 Pages 848 - 852 Chap 40 Section 6 Pages 830 - 835	Ecological disaster Research Paper Trash lab		
Ecology/Biomes	<p>15. Identify biomes based on environmental factors and native organisms.</p> <p>Example: tundra—permafrost, low humidity, lichens, polar bears</p>	VI-1	Chap 42 Pages 862 - 892	Poster Project, biome research and presentations		
Ecology/Biomes	<p>16. Identify density-dependent and density-independent limiting factors that affect populations in an ecosystem.</p> <p>Examples: density-dependent—disease, predator-prey relationships, availability of food and water; density-independent—natural disasters, climate</p> <p>16a. Discriminating among symbiotic relationships, including mutualism, commensalism, and parasitism</p>	VI-1	Chap 39 Sections 2 Pages 804 - 806 Chap 40 Pages 818 - 829	Project wet		