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| **Following the Big Ideas** | |
| **Big Idea 1** | Darwin’s theory of natural selection states that organisms survive because they possess more favorable adaptations to their environment; and these heritable traits are passed on to offspring |
| **Big Idea 4** | Evolution by natural selection comes about from interactions between an organism and its environment |

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| **Essential Questions** |
| * How can DNA analysis and genome comparisons allow us to better understand the evolution of species? * How can genetic engineering techniques be used to benefit human society? * How can the manipulation of DNA by humans affect the evolution of species, and what are the artificial, medical and social implications? |

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| **Vocabulary** | | |
| 1. Uniformitarianism 2. Use and Disuse 3. Acquired characteristics 4. Evolutionary Tree | 1. Homologous structures 2. Vestigial structures 3. Analogous structures | 1. Convergent evolution 2. Biogeography 3. Continental drift 4. Endemic Species |

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| **Chapter Outline and Reading Guide** | |
| **Section 1**   1. How did each of the following sources view the origin of species?    1. Aristotle and Scala Naturae:    2. The Old Testament:    3. Carolus Linnaeus: 2. Explain the role of fossils in rock strata as a window to life in earlier times. 3. How would Georges Cuvier have explained the appearance of the record of life shown in the rock strata? 4. James Hutton and Charles Lyell were geologists whose ideas strongly influenced Darwin’s thinking. What were the ideas each of them contributed?    1. James Hutton:    2. Charles Lyell: 5. Jean-Baptiste de Lamarck proposed a mechanism for how life changes over time. Explain the two principles of his mechanism.    1. use and disuse:    2. inheritance of acquired characteristics: 6. Although Lamarck’s mechanism of evolution does not explain the changes in species over time, his thinking has been influential. What is considered to be the great importance of his ideas | **Section 2**   1. Explain for each of the following are essential to natural selection    1. Variations in traits exist.    2. These variations (traits) are heritable.    3. Species overproduce.    4. There is competition for resources; not all offspring survive.   **Section 3**   1. Use Figure 19.14 in your text to explain how research with soapberry bugs demonstrated observable evolutionary change. 2. MRSA is in the news today because it is becoming increasingly more common.    1. How did it become so dangerous?    2. Explain the evolution of MRSA’s resistance to methicillin. 3. Explain how each of following can be used as evidences of evolution    1. Homology    2. Fossil Record    3. Biogeography 4. Figure 19.20 in your text shows an evolutionary tree. What is indicated by each branch point in the figure? |

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| **After You Have Read…** |

1. What does Darwin mean by evolution as “descent with modification?”
2. How do random mutations in DNA and genetic variation result in phenotypic variations that are subject to natural selection?
3. How does evolution by natural selection explain both the unity and diversity of life on earth?
4. How can environmental change and human activity impact the evolution of species?
5. Do antibiotics cause bacteria to become resistant? Explain your response.