**Biology Program Goals and Objectives
Grade Level 6**

**About the Biology Program**
All students will participate in the Barrier Island Ecology Course at the same time. Small groups of approximately twelve students together with a Sound to Sea instructor each start in a different habitat area and begin a rotation. This component introduces students to the five habitats (beach/ocean, maritime forest, freshwater pond, salt marsh, and sound/estuary), geological history, basic ecological concepts and general habitat study skills that are reinforced throughout the entire program. Sound to Sea instructors encourage exploration and present various ecological concepts (such as habitats, cycles, communities, populations, species, food webs, decomposition, etc.) as students discover concrete evidence that relates to that concept. As the groups explore each habitat, students observe the differences and make comparisons. The Habitat Study skills include: observation, measurement, data collection, and analysis and assessment of habitat conditions with respect to soil, air, water, wind, temperature, and human impact; and observation, identification, classification, mapping and representative sampling of species present within the habitat.

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| **Main Curriculum Area: Science** |
| **Other Curriculum Area: Health Education** |

 **Grade Level: 6**

**Sound to Sea Program**

**6th Grade Primary Goals and Objectives:**
These objectives will be covered during all Biology Program classes. Some objectives are more specific to one habitat than another, so if your schedule does not allow you to take all offered classes, or if there are particular objectives that you want to make sure we cover, please let us know what your specific needs are.

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| **Essential Standard 6.L.1** | **Understand the structures, processes and behaviors of plants that enable them to survive and reproduce.** |
|  | **Clarifying Objectives****6.L.1.1**Summarize the basic structures and functions of flowering plants required for survival, reproduction and defense.**6.L.1.2**Explain the significance of the processes of photosynthesis, respiration, and transpiration to the survival of green plants and other organisms. |
| **Essential Standard 6.L.2** | **Understand the flow of energy through ecosystems and the responses of populations to the biotic and abiotic factors in their environment.** |
|  | **Clarifying Objectives** **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.**6.L.2.2**Explain how plants respond to external stimuli (including dormancy and forms of tropism) to enhance survival in an environment.**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. |

**7th Grade Primary Goals and Objectives:**
These objectives will be covered during all Biology Program classes. Some objectives are more specific to one habitat than another, so if your schedule does not allow you to take all offered classes, or if there are particular objectives that you want to make sure we cover, please let us know what your specific needs are.

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| **Essential Standard 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.** |
|  | **Clarifying Objectives****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.**7.E.1.5**Explain the influence of convection, global winds and the jet stream on weather and climatic conditions. |
| **Essential Standard 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.** |
|  | **Clarifying Objectives** **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. |
| **Essential Standard 7.G.1** | **Understand how geography, demographic trends, and environmental conditions shape modern societies and regions.** |
|  | **Clarifying Objectives** **7.G.1.3**Explain how natural disasters (e.g. flooding, earthquakes, monsoons and tsunamis), preservation efforts and human modification of the environment (e.g. recycling, planting trees, deforestation, pollution, irrigation systems and climate change) affect modern societies and regions. |

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**8th Primary Goals and Objectives:**
These objectives will be covered during all Biology Program classes. Some objectives are more specific to one habitat than another, so if your schedule does not allow you to take all offered classes, or if there are particular objectives that you want to make sure we cover, please let us know what your specific needs are.

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| **Essential Standard 8.P.2** | **Explain the environmental implications associated with the various methods of obtaining, managing, and using energy resources.** |
|  | **Clarifying Objectives****8.P.2.1**Explain the environmental consequences of the various methods of obtaining, transforming and distributing energy.**8.P.2.2**Explain the implications of the depletion of renewable and nonrenewable energy resources and the importance of conservation. |
| **Essential Standard 8.E.1** | **Understand the hydrosphere and the impact of humans on local systems and the effects of the hydrosphere on humans.** |
|  | **Clarifying Objectives** **8.E.1.1** Explain the structure of the hydrosphere including: • Water distribution on earth • Local river basins and water availability**8.E.1.2** Summarize evidence that Earth's oceans are a reservoir of nutrients, minerals, dissolved gases, and life forms: • Estuaries • Marine ecosystems • Upwelling • Behavior of gases in the marine environment • Value and sustainability of marine resources • Deep ocean technology and understandings gained**8.E.1.3**Predict the safety and potability of water supplies in North Carolina based on physical and biological factors, including: • Temperature • Dissolved oxygen • pH • Nitrates and phosphates • Turbidity • Bio-indicators**8.E.1.4**Conclude that the good health of humans requires: • Monitoring of the hydrosphere • Water quality standards • Methods of water treatment • Maintaining safe water quality • Stewardship |
| **Essential Standard 8.L.3** | **Understand how organisms interact with and respond to the biotic and abiotic components of their environment.** |
|  | **Clarifying Objectives** **8.L.3.1**Explain how factors such as food, water, shelter and space affect populations in an ecosystem.**8.L.3.2** Summarize the relationships among producers, consumers, and decomposers including the positive and negative consequences of such interactions including: • Coexistence and cooperation • Competition (predator/prey) • Parasitism • Mutualism**8.L.3.3** Explain how the flow of energy within food webs is interconnected with the cycling of matter (including water, nitrogen, carbon dioxide and oxygen). |
| **Essential Standard 8.L.5** | **Understand the composition of various substances as it relates to their ability to serve as a source of energy and building materials for growth and repair of organisms.** |
|  | **Clarifying Objectives****8.L.5.1**Summarize how food provides the energy and the molecules required for building materials, growth and survival of all organisms (to include plants).  |

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| **Evening Program Goals and Objectives****Survival on the Coast:**Emphasizes the connection between social studies and science with demonstrations of skills used by coastal Native Americans and later cultures.**Main Curriculum Area: Social Studies**

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| **Social Studies Competency Goal 1** | **Impact of GeographyThe learner will assess the influence of geography on the economic, social, and political development of North Carolina.** |
|  | **Objectives****1.3** Analyze ways North Carolinians have modified, used, and adapted to the physical environment.  |
| **Social Studies Competency Goal 2** | **Impact of ExplorationThe learner will evaluate the effects of early contacts between various European nations and Native Americans.** |
|  | **Objectives****2.1** Identify Native-American cultures and evaluate their contributions to North Carolina culture. **2.2** Describe and explain differences between Native Americans and Europeans in their attitudes toward the use of natural resources. **2.3** Describe the influence of trading contacts on relations between Native Americans and Europeans in North America. |

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| **First in Flight:**Showcases our live birds of prey with additional stations covering the history of flight in NC, properties of air, mechanics of flight, bird beak and raptor adaptations. This outdoor or indoor program is suitable for groups of all sizes. **Main Curriculum Area: Science****Other Curriculum Areas: Social Studies**

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| **Science Competency Goal 4** | **The learner will build an understanding of motion and forces.** |
|  | **Objectives****4.01** Analyze gravity as a universal force.**4.02** Demonstrate ways that simple machines can change force.**4.03** Analyze simple machines for mechanical advantage and efficiency.**4.04** Determine how the force of friction retards motion. |
| **Social Studies Competency Goal 2** | **Impact of Changes Since 1945The learner will judge the continuing significance of social, economic, and political changes since 1945 and draw conclusions about their effects on contemporary life.** |
|  | **Objectives****11.2** Evaluate the importance of technological innovations and advances on quality of life in North Carolina and the nation. |

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**Beach Walk/Turtle Talk:**
Casual yet informative. Students study our endangered sea turtles and the night creatures of the beach/dune area. This outdoor program is best suited for 60 or less students and requires a back-up plan in case of rain.

**Main Curriculum Area: Science
Other Curriculum Areas: Social Studies**

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| **Science Competency Goal 2** | **The learner will build an understanding of population dynamics.** |
|  | **Objectives** **2.01** Evaluate data related to population growth, along with problems and solutions:* Waste disposal.
* Food supplies.
* Disease control.
* Resource availability.
* Transportation.

**2.02** Conclude that some ecosystem resources are finite.**2.03** Explain how changes in habitat may affect organisms. |
| **Social Studies Competency Goal 2** | **Impact of Changes Since 1945The learner will judge the continuing significance of social, economic, and political changes since 1945 and draw conclusions about their effects on contemporary life.** |
|  | **Objectives****11.2** Evaluate the importance of technological innovations and advances on quality of life in North Carolina and the nation. |