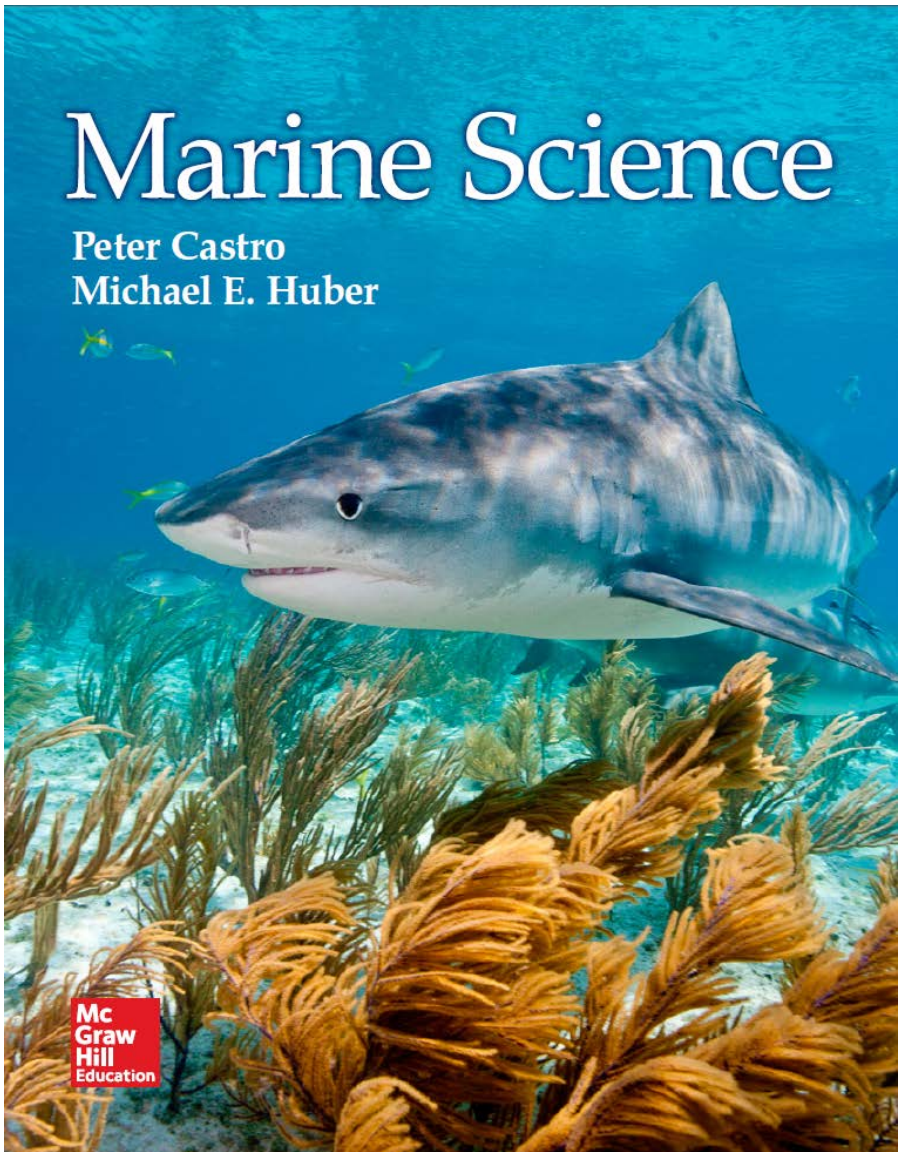
# NGSS
# CORRELATION GUIDE
## *Marine Science*




By Peter Castro & Michael E. Huber
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**NGSS Correlation**
***Marine Science*, (1e)**
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| **Next Generation Science Standards Life Science Performance Expectations** | **Marine Science, 1st Edition, ©2016** |
|---|---|
| **HS-LS1 From Molecules to Organisms: Structures and Processes** | |
| HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells. | 143-144 |
| HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms. | 152-153, 227-228, 231, 241-243, 250, 257-258, 276-277, 279-283, 314 |
| HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis. | 141, 167-170, 280-281, 425 |
| HS-LS1-4. Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms. | 154-155 |
| HS-LS1-5. Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy. | 144-145, 147, 181-182, 377<br>*In Context* 377 |

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| HS-LS1-6. Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules. | 146 |
| HS-LS1-7. Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed resulting in a net transfer of energy. | 145-146, 377<br>*In Context* 377 |
| **HS-LS2 Ecosystems: Interactions, Energy, and Dynamics** | |
| HS-LS2-1. Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales. | 358-359, 361 |
| HS-LS2-2. Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales. | 358-359, 361, 367<br>*Nature of Science* 360 |
| HS-LS2-3. Construct and revise an explanation based on evidence for the cycling of matter and flow of energy in aerobic and anaerobic conditions. | 72-73, 178, 363, 372-379, 381-383, 412-413, 563-564 |
| HS-LS2-4. Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem. | 72-73, 178, 363, 372-379, 381-383, 442-443, 462, 467-468, 502-505, 539-547, 549, 556, 563-534<br>*Marine Science in Action* 548 |

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| HS-LS2-5. Develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere. | 72-73, 74-75, 178, 379, 381, 447, 465<br>*Marine Science in Action* 24 |
| HS-LS2-6. Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem. | 75, 77, 136, 405-407, 475-478, 624-626<br>*Habitat Spotlight* 76<br>*Marine Science in Action* 24 |
| HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.* | 332-335, 447, 599-601, 604-607, 642-645<br>*Habitat Spotlight* 445, 469<br>*Humans and the Ocean* 609 |
| HS-LS2-8. Evaluate the evidence for the role of group behavior on individual and species' chances to survive and reproduce. | 289-292, 294-296, 307, 309, 344-345, 347-348 |
| **HS-LS3 Heredity: Inheritance and Variation of Traits** | |
| HS-LS3-1. Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring. | 154, 155-157 |
| HS-LS3-2. Make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors. | 156-157 |

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| HS-LS3-3. Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population. | Can be incorporated into the following:<br>158, 357-358, 364 |
| **HS-LS4 Biological Evolution: Unity and Diversity** | |
| HS-LS4-1. Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence. | 161-164<br>*Dive In!* 259<br>*Marine Science in Action* 324<br>*Nature of Science* 160 |
| HS-LS4-2. Construct an explanation based on evidence that the process of evolution primarily results from four factors: (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment. | 158, 357-358, 364 |
| HS-LS4-3. Apply concepts of statistics and probability to support explanations that organisms with an advantageous heritable trait tend to increase in proportion to organisms lacking this trait. | 158, 357-358, 364 |
| HS-LS4-4. Construct an explanation based on evidence for how natural selection leads to adaptation of populations. | 158, 167-170, 285-295, 338-340, 357-358, 364, 394, 426, 467-468, 528-531, 533-538, 556-564, 565-566, 568-570<br>*Marine Science in Action* 536-537, 567 |

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| HS-LS4-5. Evaluate the evidence supporting claims that changes in environmental conditions may result in: (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species. | 75, 77, 136, 359, 621-623, 638-639, 641<br>*Habitat Spotlight* 76<br>*Marine Science in Action* 24, 640<br>*Nature of Science* 360 |
| HS-LS4-6. Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.* | 332-335, 447, 599-601, 604-607, 642-645<br>*Habitat Spotlight* 445, 469<br>*Humans and the Ocean* 609 |