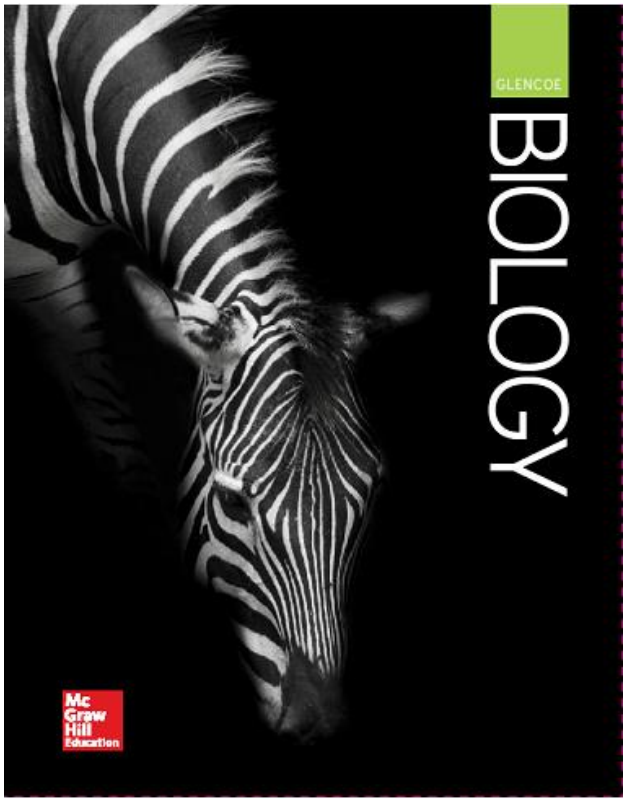
Louisiana STUDENT STANDARDS SCIENCE



Activity = ***Applying Practices*** **activity found on https://connected.mcgraw-hill.com**

PERFORMANCE EXPECTATIONS	PAGE REFERENCES
FROM MOLECULES TO ORGANISMS: STRUCTURES AND PROCESSES	
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.	**Activity:** Transcription and Translation, Chapter 12 Section 3 Systems of specialized cells within organisms help them perform the essential functions of life. **Student Edition:** 256–257, 258, 632–638, 639–640, 694, 947–948, 962–963, 997–998, 1085–1089 **Teacher Edition:** DC 344, 962, 108/5; SP 633, 638, 997
PERFORMANCE EXPECTATIONS	**PAGE REFERENCES**
Continued from previous cell… 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.	***Continued from previous cell…*** All cells contain genetic information in the form of DNA molecules. **Student Edition:** 171, 186, 193, 247, 249, 270, 272, 336–341, 342–345 **Teacher Edition:** CT 338; DC 171, 343, 340; MI 336; WS 336
Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.	**Activity:** Hierarchical Organization in Plants, Chapter 22 Section 1, Chapter 22 Section 2 Multicellular organisms have a hierarchical structural organization **Student Edition:** 632–638, 639–640, 642, 728, 739, 747, 768, 796, 865, 886, 947–948, 962–967, 968–972, 973–976, 992–998, 1000–1003, 1005–1007, 1020–1024, 1031–1037 **Teacher Edition:** CT 642; DC 739; DE 886, 1001; MI 968; SP 1003
Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis in living organisms.	**Activity:** Investigate Osmosis, Chapter 7 Section 4 Feedback mechanisms maintain a living system's internal conditions. **Student Edition:** 10, 203–206, 547, 556, 636–638, 639–640, 642, 644–647, 727, 739, 747, 767, 795, 825, 854, 884, 938–939, 946, 969–970, 992, 1005–1007, 1032–1037 **Teacher Edition:** DC 206, 636, 1032, 1033, 1037; SP 1032
Use a model to illustrate the role of the cell cycle and differentiation in producing and maintaining complex organisms.	**Student Edition:** 242, 246-247, 248-252, 253-257, 258, 344 **Teacher Edition:** DC 344; DE 249; FA 257; MI 253; SP 246

Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.	**Activity:** Modeling Photosynthesis, Chapter 8 Section 2 The process of photosynthesis converts light energy **Student Edition:** 41–44, 220, 222–227, 233, 235, 644–645 **Teacher Edition:** CT 224; WS 219, 224

PERFORMANCE EXPECTATIONS	PAGE REFERENCES
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.	**Activity:** Exploring Macromolecules, Chapter 6 Section 4 The sugar molecules thus formed contain carbon, hydrogen, and oxygen. **Student Edition:** 166–171, 222, 226, 229–232 **Teacher Edition:** FA 171 As matter and energy flow through different organizational levels of living systems **Student Edition:** 41–44, 45–49, 218–220, 222, 229–232, 1026–1029 **Teacher Edition:** FA 1030; MI 1025
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.	**Activity:** Modeling Cellular Respiration, Chapter 8 Section 3 As matter and energy flow through different organizational levels of living systems, chemical elements are recombined in different ways to form different products. **Student Edition:** 220, 228–233 **Teacher Edition:** WS 229 As a result of these chemical reactions, energy is transferred. **Student Edition:** 220, 228–233 **Teacher Edition:** AC 228; CT 221; DE 220; FA 233
Obtain, evaluate, and communicate information about (1) viral and bacterial reproduction and adaptation, (2) the body's primary defenses against infection, and (3) how these features impact the design of effective treatment.	**Student Edition:** 429, 520, 527-531, 533, 1084-1091 **Teacher Edition:** DC 531; DE 429; FA 524
ECOSYSTEMS: INTERACTIONS, ENERGY AND DYNAMICS	
Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity, biodiversity and populations of ecosystems at different scales.	**Activity:** Carrying Capacity of Nectar-Feeding Bats, Chapter 4 Section 1 Ecosystems have carrying capacities, which are limits to the numbers of organisms and populations they can support. **Student Edition:** 94–99, 105 **Teacher Edition:** AC 97; DC 94

PERFORMANCE EXPECTATIONS	PAGE REFERENCES
Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem.	**Activity:** Ecological Pyramids, Chapter 2 Section 2 Plants or algae form the lowest level of the food web. **Student Edition:** 41–44, 45–49, 219–220 **Teacher Edition:** SP 44
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.	**Activity:** Local Ecosystem Dynamics, Chapter 2 Section 1, Chapter 3 Section 1, Chapter 5 Section 2 **Student Edition:** 34–40, 62–64, 94–98, 123–128 **Teacher Edition:** CT 62; DC 62; DE 126
Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.	**Activity:** Microbeads, Mega-Problem, Chapter 3 Section 3, Chapter 5 Section 2, Chapter 5 Section 3 Ecosystem Dynamics, Functioning, and Resilience **Student Edition:** 120, 122–128, 744, 801, 833, 841, 860, 869 **Teacher Edition:** CT 126; DC 126; MI 122; SP 125; WS 744, 801, 841 **Biodiversity and Humans** **Student Edition:** 116–118, 118–120, 122–123, 123–128, 129–135, 131–135 **Teacher Edition:** DE 118; MI 116; RS 118, 123 **Developing Possible Solutions** **Science and Engineering Practices Handbook:** Practice 1, Practice 6 **Student Edition:** 129–135 **Teacher Edition:** DC 133; WS 120, 133
HEREDITY: INHERITANCE AND VARIATION OF TRAITS	
Formulate, refine, and evaluate questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.	**Activity:** Meiosis, Chapter 10 Section 1 All cells contain genetic information in the form of DNA molecules. **Student Edition:** 193, 247, 249, 270, 272, 336–341, 342–344 **Teacher Edition:** CT 338; DC 338, 344; MI 336; WS 193, 336 Chromosomes **Student Edition:** 247, 270, 329–332, 336–341, 342–345, 373 **Teacher Edition:** DC 332; MI 270; WS 247

PERFORMANCE EXPECTATIONS	PAGE REFERENCES
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.	**Activity:** Investigating Genetic Variation, Chapter 10 Section 1, Chapter 10 Section 2, Chapter 10 Section 3, Chapter 11 Section 3, Chapter 12 Section 4 In sexual reproduction, chromosomes can sometimes swap sections during the process of meiosis (cell division), thereby creating new genetic combinations and thus more genetic variation. **Student Edition:** 271–276, 283–285, 312–313, 342–349 **Teacher Edition:** CT 349; DC 272, 276; FA 285; MI 283; RS 283 Environmental factors also affect expression of traits. **Student Edition:** 309–310 **Teacher Edition:** DE 309
Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.	**Activity:** Punnett Squares, Chapter 10 Section 2 Environmental factors also affect expression of traits, and hence affect the probability of occurrences of traits in a population. **Student Edition:** 280-282, 309–310 **Teacher Edition:** DC 282; DE 309
BIOLOGICAL EVOLUTION: UNITY AND DIVERSITY	
Analyze and interpret scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.	**Activity:** Evidence for Evolution, Chapter 15 Section 2, Chapter 17 Section 2 Genetic information **Student Edition:** 423–427, 491, 493–495 **Teacher Edition:** CT 492; DC 493; MI 491; SP 427
Construct an explanation based on evidence that biological diversity is influenced by (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.	**Activity:** Pest Management and Natural Selection, Chapter 15 Section 1, Chapter 15 Section 2 Natural selection **Student Edition:** 420–422, 434-436 **Teacher Edition:** DC 421 Adaptation **Student Edition:** 420–422, 431–436 **Teacher Edition:** CB 439; DE 420

PERFORMANCE EXPECTATIONS	PAGE REFERENCES
Apply concepts of statistics and probability to support explanations that populations of organisms adapt when an advantageous heritable trait increases in proportion to organisms lacking this trait.	**Activity:** Could You Beat Natural Selection Using Camouflage?, Chapter 15 Section 1 Natural selection **Student Edition:** 420–422, 434-436 **Teacher Edition:** SP 434 Adaptation **Student Edition:** 428-430
Construct an explanation based on evidence for how natural selection and other mechanisms lead to genetic changes in populations.	**Activity:** Can Scientists Model Natural Selection?, Chapter 15 Section 2 Adaptation **Student Edition:** 428–430 **Teacher Edition:** DC 428; DE 429; FA 430
Evaluate evidence supporting claims that changes in environmental conditions can affect the distribution of traits in a population causing: (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.	**Activity:** Evaluating Impacts of Environmental Change on Populations, Chapter 5 Section 2 Adaptation **Student Edition:** 122–128, 438 **Teacher Edition:** DC 125; DE 122; SP 125; WS 122, 124, 439