

## Introduction to Agriculture, Food, and Natural Resources Next Generation Science Standards Alignment

|   | Unit 1 The Circles of Agricultural Education | Unit 2 Communicating Today | Unit 3 The Science of Agriculture | Unit 4 Natural Resources | Unit 5 Plants and Animals | Unit 6 Agricultural Power and Technology | Unit 7 Looking Ahead |
|---|--|----------------------------|-----------------------------------|--------------------------|---------------------------|--|----------------------|
| <b>Disciplinary Core Ideas</b>                                    |  |                            |                                   |                          |                           |  |                      |
| <b>Life Science</b>   |  |                            |                                   |                          |                           |  |                      |
| <b>LS1: From Molecules to Organisms: Structures and Processes</b> |  |                            |                                   |                          |                           |  |                      |
| • LS1.A: Structure and Function                                   |  |                            |                                   |                          | X                         |  |                      |
| • LS1.B: Growth and Development of Organisms                      |  |                            |                                   |                          |                           |  |                      |
| • LS1.C: Organization for Matter and Energy Flow in Organisms     |  |                            |                                   | X                        | X                         |  |                      |
| <b>LS2: Ecosystems: Interactions, Energy, and Dynamics</b>        |  |                            |                                   |                          |                           |  |                      |
| • LS2.A: Interdependent Relationships in Ecosystems               |  |                            |                                   | X                        |                           |  |                      |
| • LS2.B: Cycles of Matter and Energy Transfer in Ecosystems       |  |                            |                                   | X                        |                           |  |                      |
| • LS2.C: Ecosystem Dynamics, Functioning, and Resilience          |  |                            |                                   | X                        |                           |  |                      |
| • LS2.D: Social Interactions and Group Behavior                   |  |                            |                                   |                          |                           |  |                      |
| <b>LS3: Heredity: Inheritance and Variation of Traits</b>         |  |                            |                                   |                          |                           |  |                      |
| • LS3.A: Inheritance of Traits                                    |  |                            |                                   |                          | X                         |  |                      |
| • LS3.B: Variation of Traits                                      |  |                            |                                   |                          | X                         |  |                      |
| <b>LS4: Biological Evolution: Unity and Diversity</b>             |  |                            |                                   |                          |                           |  |                      |
| • LS4.A: Evidence of Common Ancestry and Diversity                |  |                            |                                   |                          |                           |  |                      |
| • LS4.B: Natural Selection  |  |                            |                                   |                          |                           |  |                      |
| • LS4.C: Adaptation   |  |                            |                                   |                          |                           |  |                      |
| • LS4.D: Biodiversity and Humans                                  |  |                            |                                   |                          |                           |  | X                    |
| <b>Earth and Space Science</b>                                    |  |                            |                                   |                          |                           |  |                      |
| <b>ESS1: Earth's Place in the Universe</b>                        |  |                            |                                   |                          |                           |  |                      |
| • ESS1.A: The Universe and Its Stars                              |  |                            |                                   |                          |                           |  |                      |
| • ESS1.B: Earth and the Solar System                              |  |                            |                                   |                          |                           |  |                      |
| • ESS1.C: The History of Planet Earth                             |  |                            |                                   |                          |                           |  |                      |
| <b>ESS2: Earth's Systems</b>                                      |  |                            |                                   |                          |                           |  |                      |
| • ESS2.A: Earth Materials and Systems                             |  |                            |                                   |                          |                           |  |                      |
| • ESS2.B: Plate Tectonics and Large-Scale System Interactions     |  |                            |                                   |                          |                           |  |                      |
| • ESS2.C: The Roles of Water in Earth's Surface Processes         |  |                            |                                   | X                        |                           |  |                      |
| • ESS2.D: Weather and Climate                                     |  |                            |                                   |                          |                           |  |                      |
| • ESS2.E: Biogeology  |  |                            |                                   |                          |                           |  |                      |

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| <b>ESS3: Earth and Human Activity</b>   |  |                            |                                   |                          |                           |  |                      |
| • ESS3.A: Natural Resources   | X  |                            |                                   | X                        |                           | X  |                      |
| • ESS3.B: Natural Hazards   |  |                            |                                   |                          |                           |  |                      |
| • ESS3.C: Human Impacts on Earth Systems  |  |                            |                                   | X                        |                           | X  | X                    |
| • ESS3.D: Global Climate Change   |  |                            |                                   |                          |                           |  |                      |
| <b>Physical Science</b>   |  |                            |                                   |                          |                           |  |                      |
| <b>PS1: Matter and Its Interactions</b>   |  |                            |                                   |                          |                           |  |                      |
| • PS1.A: Structure and Properties of Matter                                       |  |                            |                                   |                          |                           |  |                      |
| • PS1.B: Chemical Reactions   |  |                            |                                   |                          | X                         |  |                      |
| • PS1.C: Nuclear Processes  |  |                            |                                   |                          |                           |  |                      |
| <b>PS2: Motion and Stability: Forces and Interactions</b>                         |  |                            |                                   |                          |                           |  |                      |
| • PS2.A: Forces and Motion  |  |                            |                                   |                          |                           |  |                      |
| • PS2.B: Types of Interactions  |  |                            |                                   |                          |                           |  |                      |
| <b>PS3: Energy</b>  |  |                            |                                   |                          |                           |  |                      |
| • PS3.A: Definitions of Energy  |  |                            |                                   |                          |                           |  |                      |
| • PS3.B: Conservation of Energy and Energy Transfer                               |  |                            |                                   |                          |                           |  |                      |
| • PS3.C: Relationship Between Energy and Forces                                   |  |                            |                                   |                          |                           |  |                      |
| • PS3.D: Energy in Chemical Processes and Everyday Life                           |  |                            |                                   |                          |                           |  |                      |
| <b>PS4: Waves and Their Applications in Technologies for Information Transfer</b> |  |                            |                                   |                          |                           |  |                      |
| • PS4.A: Wave Properties  |  |                            |                                   |                          |                           |  |                      |
| • PS4.B: Electromagnetic Radiation  |  |                            |                                   |                          |                           |  |                      |
| • PS4.C: Information Technologies and Instrumentation                             |  |                            |                                   |                          |                           |  |                      |
| <b>Engineering, Technology, and the Application of Science</b>                    |  |                            |                                   |                          |                           |  |                      |
| • ETS1: Engineering Design  |  |                            |                                   |                          |                           |  |                      |
| • ETS1.A: Defining and Delimiting Engineering Problems                            |  |                            |                                   |                          |                           |  |                      |
| • ETS1.B: Developing Possible Solutions   |  |                            |                                   |                          |                           |  |                      |
| • ETS1.C: Optimizing the Design Solution  |  |                            |                                   |                          |                           |  |                      |
| <b>Science and Engineering Practices</b>  |  |                            |                                   |                          |                           |  |                      |
| • Asking Questions and Defining Problems  |  |                            |                                   | X                        | X                         | X  |                      |
| • Developing and Using Models   |  |                            |                                   |                          | X                         | X  |                      |
| • Planning and Carrying Out Investigations  |  |                            | X                                 | X                        | X                         | X  |                      |
| • Analyzing and Interpreting Data   | X  |                            | X                                 | X                        | X                         | X  |                      |
| • Using Mathematics and Computational Thinking                                    |  |                            |                                   |                          |                           | X  |                      |
| • Constructing Explanations and Designing Solutions                               |  |                            |                                   |                          | X                         |  |                      |
| • Engaging in Argument from Evidence  |  |                            |                                   |                          | X                         | X  |                      |
| • Obtaining, Evaluating, and Communicating Information                            |  |                            | X                                 | X                        | X                         | X  |                      |

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| <b>Crosscutting Concepts</b>                         |  |                            |                                   |                          |                           |  |                      |
| • Patterns   |  |                            |                                   | X                        | X                         |  |                      |
| • Cause and Effect: Mechanism and Prediction         | X  |                            | X                                 | X                        | X                         | X  |                      |
| • Scale, Proportion, and Quantity                    |  |                            |                                   | X                        |                           |  |                      |
| • Systems and System Models                          |  |                            |                                   |                          | X                         |  |                      |
| • Energy and Matter: Flows, Cycles, and Conservation |  |                            |                                   | X                        |                           |  |                      |
| • Structure and Function                             |  |                            |                                   | X                        | X                         |  |                      |
| • Stability and Change                               |  |                            |                                   | X                        |                           |  |                      |

| <b>Understandings about the Nature of Science</b>                        |   |  |   |  |   |   |  |
|--|---|--|---|--|---|---|--|
| • Scientific Investigations Use a Variety of Methods                     |   |  | X |  | X | X |  |
| • Scientific Knowledge is Based on Empirical Evidence                    |   |  |   |  |   | X |  |
| • Scientific Knowledge is Open to Revision in Light of New Evidence      |   |  |   |  |   |   |  |
| • Science Models, Laws, Mechanisms, & Theories Explain Natural Phenomena |   |  | X |  |   |   |  |
| • Science is a Way of Knowing  |   |  | X |  | X |   |  |
| • Scientific Knowledge Assumes Order & Consistency in Natural Systems    |   |  |   |  | X |   |  |
| • Science is a Human Endeavor  | X |  | X |  |   |   |  |
| • Science Addresses Questions About the Natural and Material World.      |   |  |   |  | X | X |  |