## Disciplinary Core Ideas

### Life Science

**LS1: From Molecules to Organisms: Structures and Processes**
- **LS1.A: Structure and Function**
- **LS1.B: Growth and Development of Organisms**
- **LS1.C: Organization for Matter and Energy Flow in Organisms**

**LS2: Ecosystems: Interactions, Energy, and Dynamics**
- **LS2.A: Interdependent Relationships in Ecosystems**
- **LS2.B: Cycles of Matter and Energy Transfer in Ecosystems**
- **LS2.C: Ecosystem Dynamics, Functioning, and Resilience**
- **LS2.D: Social Interactions and Group Behavior**

**LS3: Heredity: Inheritance and Variation of Traits**
- **LS3.A: Inheritance of Traits**
- **LS3.B: Variation of Traits**

**LS4: Biological Evolution: Unity and Diversity**
- **LS4.A: Evidence of Common Ancestry and Diversity**
- **LS4.B: Natural Selection**
- **LS4.C: Adaptation**
- **LS4.D: Biodiversity and Humans**

### Earth and Space Science

**ESS1: Earth’s Place in the Universe**
- **ESS1.A: The Universe and Its Stars**
- **ESS1.B: Earth and the Solar System**
- **ESS1.C: The History of Planet Earth**

**ESS2: Earth’s Systems**
- **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**
- **ESS2.D: Weather and Climate**
- **ESS2.E: Biogeology**

**ESS3: Earth and Human Activity**
- **ESS3.A: Natural Resources**
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- **ESS3.B:** Natural Hazards
- **ESS3.C:** Human Impacts on Earth Systems
- **ESS3.D:** Global Climate Change

### Physical Science

**PS1: Matter and Its Interactions**
- PS1.B: Chemical Reactions
- PS1.C: Nuclear Processes

**PS2: Motion and Stability: Forces and Interactions**
- PS2.A: Forces and Motion
- PS2.B: Types of Interactions

**PS3: Energy**
- 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

**PS4: Waves and Their Applications in Technologies for Information Transfer**
- PS4.A: Wave Properties
- PS4.B: Electromagnetic Radiation
- PS4.C: Information Technologies and Instrumentation

### Engineering, Technology, and the Application of Science

- **ETS1:** Engineering Design
  - ETS1.A: Defining and Delimiting Engineering Problems
  - ETS1.B: Developing Possible Solutions
  - ETS1.C: Optimizing the Design Solution

### Science and Engineering Practices

- Asking Questions and Defining Problems
- Developing and Using Models
- Planning and Carrying Out Investigations
- Analyzing and Interpreting Data
- Using Mathematics and Computational Thinking
- Constructing Explanations and Designing Solutions
- Engaging in Argument from Evidence
- Obtaining, Evaluating, and Communicating Information

### Crosscutting Concepts

- Patterns
<table>
<thead>
<tr>
<th>Understandings about the Nature of Science</th>
<th>Unit 1 Animal Planet</th>
<th>Unit 2 History and Use of Animals</th>
<th>Unit 3 Animal Handling and Safety</th>
<th>Unit 4 Cells and Tissues</th>
<th>Unit 5 Animal Nutrition</th>
<th>Unit 6 Animal Reproduction</th>
<th>Unit 7 Genetics</th>
<th>Unit 8 Animal Health</th>
<th>Unit 9 Animal Products, Marketing, and Selection</th>
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Understandings about the Nature of Science:

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