## 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

**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.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
- ESS3.B: Natural Hazards
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**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
- Cause and Effect: Mechanism and Prediction
- Scale, Proportion, and Quantity
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**Understandings about the Nature of Science**

- Scientific Investigations Use a Variety of Methods
  - 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
- Scientific Knowledge Assumes Order & Consistency in Natural Systems
- Science is a Human Endeavor
- Science Addresses Questions About the Natural and Material World.