# General DLM Science Phase I Blueprint

**Elementary, Middle, and High School General Science**

In this document, the "blueprint" refers to the range of Essential Elements (EEs) that will be assessed during Phase I of the Dynamic Learning Maps® (DLM®) Science project. The Science EEs are arranged into the three domains, ten core ideas, and sixteen topics shown in the table below. States will assess fifteen topics as part of their assessment. The specific fifteen topics assessed is based on a state's selection of either the general high school assessment or the HS Biology assessment.

## Domains, Core Ideas, and Topics in Science

| Domain | Core Idea | Topic |
|---|---|---|
| Physical | PS1: Matter and Its Interactions | PS1.A: Structure and Properties of Matter |
| | PS2: Motion and Stability: Forces and Interactions | PS2.A: Forces and Motion |
| | | PS2.B: Types of Interactions |
| | PS3: Energy | PS3.B: Conservation of Energy and Energy Transfer |
| | | PS3.D: Energy in Chemical Processes and Everyday Life |
| Life | LS1: From Molecules to Organisms: Structure 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 |
| | LS3: Heredity: Inheritance and Variation of Traits | LS3.B: Variation of Traits |
| | LS4: Biological Evolution: Unity and Diversity | LS4.C: Adaptation |
| Earth and Space | ESS1: Earth's Place in the Universe | ESS1.B: Earth and the Solar System |
| | ESS2: Earth's Systems | ESS2.A: Earth Materials and Systems |
| | | ESS2.D: Weather and Climate |
| | ESS3: Earth and Human Activity | ESS3.A: Natural Resources |
| | | ESS3.C: Human Impacts on Earth Systems |

Coverage of topics is summarized for each grade span in the following table.

## Number of Essential Elements per Topic Assessed in Each Grade Span by Domain

| Grade | Physical Science Topics | | | | | Total |
|---|---|---|---|---|---|---|
| | PS1.A | PS2.A | PS2.B | PS3.B | PS3.D | |
| Elementary | 2 | | 1 | | 1 | 4 |
| Middle School | 1 | 1 | | 1 | | 3 |
| High School | 1 | 1 | | 1 | | 3 |

| Grade | Life Science Topics | | | | | | Total |
|---|---|---|---|---|---|---|---|
| | LS1.A | LS1.B | LS1.C | LS2.A | LS3.B | LS4.C | |
| Elementary | | | 1 | 1 | | | 2 |
| Middle School | 1 | 1 | | 1 | | | 3 |
| High School | 1 | | | 1 | | 1 | 3 |

| Grade | Earth and Space Science Topics | | | | | Total |
|---|---|---|---|---|---|---|
| | ESS1.B | ESS2.A | ESS2.D | ESS3.A | ESS3.C | |
| Elementary | 1 | 1 | | | 1 | 3 |
| Middle School | | 1 | 1 | | 1 | 3 |
| High School | 1 | | | 1 | 1 | 3 |

In the pages that follow, the specific EEs assessed in each grade span are listed in tables.

## Elementary (Grades 3 – 5): Essential Elements Assessed

| Topic | EE | Description |
|---|---|---|
| PS1.A | | |
| | EE.5.PS1-2 | Measure and compare weights of substances before and after heating, cooling, or mixing substances to show that weight of matter is conserved. |
| | EE.5.PS1-3 | Make observations and measurements to identify materials based on their properties (e.g., weight, shape, texture, buoyancy, color, or magnetism). |
| PS2.B | | |
| | EE.5.PS2-1 | Demonstrate that the gravitational force exerted by Earth on objects is directed down. |
| PS3.D | | |
| | EE.5.PS3-1 | Create a model to describe that energy in animals' food was once energy from the Sun. |
| LS1.C | | |
| | EE.5.LS1-1 | Provide evidence that plants need air and water to grow. |
| LS2.A | | |
| | EE.5.LS2-1 | Create a model to show the movement of matter (e.g., plant growth, eating, composting) through living things. |
| ESS1.B | | |
| | EE.5.ESS1-2 | Represent and interpret data on a picture, line, or bar graph to show seasonal patterns in the length of daylight hours. |
| ESS2.A | | |
| | EE.5.ESS2-1 | Develop a model showing how water (hydrosphere) affects the living things (biosphere) found in a region. |
| ESS3.C | | |
| | EE.5.ESS3-1 | Use information to describe how people can help protect the Earth's resources and how that affects the environment. |

## Middle School (Grades 6 – 8): Essential Elements Assessed

| Topic | EE | Description |
|---|---|---|
| PS1.A | | |
| | EE.MS.PS1-2 | Interpret and analyze data on the properties (e.g., color, texture, odor, and state of matter) of substances before and after chemical changes have occurred (e.g., burning sugar or burning steel wool, rust, effervescent tablets). |
| PS2.A | | |
| | EE.MS.PS2-2 | Investigate and predict the change in motion of objects based on the forces acting on those objects. |
| PS3.B | | |
| | EE.MS.PS3-3 | Test and refine a device (e.g., foam cup, insulated box, or thermos) to either minimize or maximize thermal energy transfer (e.g., keeping liquids hot or cold, preventing liquids from freezing, keeping hands warm in cold temperatures). |
| LS1.A | | |
| | EE.MS.LS1-3 | Make a claim about how a structure (e.g., organs and organ systems) and its related function supports survival of animals (circulatory, digestive, and respiratory systems). |
| LS1.B | | |
| | EE.MS.LS1-5 | Interpret data to show that environmental resources (e.g., food, light, space, water) influence growth of organisms (e.g., drought decreasing plant growth, fertilizer increasing plant growth, different varieties of plant seeds growing at different rates in different conditions, fish growing larger in large ponds than small ponds). |
| LS2.A | | |
| | EE.MS.LS2-2 | Use models of food chains/webs to identify producers and consumers in aquatic and terrestrial ecosystems. |
| ESS2.A | | |
| | EE.MS.ESS2-2 | Explain how geoscience processes that occur daily (e.g., wind, rain, runoff) slowly change the surface of Earth, while catastrophic events (e.g., earthquakes, tornadoes, floods) can quickly change the surface of Earth. |
| ESS2.D | | |
| | EE.MS.ESS2-6 | Interpret basic weather information (e.g., radar, map) to make predictions about future conditions (e.g., precipitation, temperature, wind). |
| ESS3.C | | |
| | EE.MS.ESS3-3 | Develop a plan to monitor and minimize a human impact on the local environment (e.g., water, land, pollution). |

## High School (Grades 9 – 12): Essential Elements Assessed

| Topic | EE | Description |
|---|---|---|
| PS1.A | | |
| | EE.HS.PS1-2 | Make a claim supported by evidence to explain patterns of chemical properties that occur in a substance during a common chemical reaction (e.g., baking soda and vinegar). |
| PS2.A | | |
| | EE.HS.PS2-3 | Evaluate the effectiveness of safety devices and design a solution that could minimize the force of a collision. |
| PS3.B | | |
| | EE.HS.PS3-4 | Investigate and predict the temperatures of two liquids before and after combining to show uniform energy distribution. |
| LS1.A | | |
| | EE.HS.LS1-2 | Use a model to illustrate the organization and interaction of major organs into systems (e.g., circulatory, respiratory, digestive, sensory) in the body to provide specific functions. |
| LS2.A | | |
| | EE.HS.LS2-2 | Use a graphical representation to explain the dependence of an animal population on other organisms for food and their environment for shelter. |
| LS4.C | | |
| | EE.HS.LS4-2 | Explain how the traits of particular species that allow them to survive in their specific environments. |
| ESS1.B | | |
| | EE.HS.ESS1-4 | Use a model of Earth and the Sun to show how Earth's tilt and orbit around the sun cause changes in seasons. |
| ESS3.A | | |
| | EE.HS.ESS3-2 | Construct an argument for a strategy to conserve, recycle, or reuse resources. |
| ESS3.C | | |
| | EE.HS.ESS3-3 | Analyze data to determine the effects of a conservation strategy on the level of a natural resource. |