DLM Science Phase I Blueprint with Biology

Elementary and Middle School General Science
High School End of Instruction Biology

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.[1]

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[1] The blueprint provides coverage options for a general science high school assessment and an end of course biology assessment to support the various requirements in different states in the consortium. Each state sets its own policy for which DLM assessment is appropriate for high school.

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

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
Biology	3	1		2	1	3	10

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

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

Elementary School (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.

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).

Topic	EE	Description
LS1.A		
	EE.HS.LS1-1	Explain how different organs of the body carry out essential functions of life.
	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.
	EE.HS.LS1-3	Collect data from an investigation to show how different organisms react to changes (e.g., heart rate increases with exercise, pupils react to light).
LS1.B		
	EE.HS.LS1-4	Use a model to illustrate how growth occurs when cells multiply.
LS2.A		
	EE.HS.LS2-1	Use a graphical representation to explain changes over time in the population size of an animal species (e.g., currently on the endangered list).
	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.
LS3.B		
	EE.HS.LS3-2	Defend why reproduction may or may not result in offspring with different traits.
LS4.C		
	EE.HS.LS4-2	Explain how the traits of particular species allow them to survive in their specific environments.
	EE.HS.LS4-3	Interpret data sets to identify an advantageous heritable trait.
	EE.HS.LS4-6	Evaluate a strategy to protect a species.