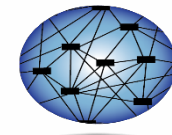


# Dynamic Learning Maps Science Assessments

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# Today's Presentation

- DLM Science Content
  - Framework
  - Essential Elements and Linkage Levels for Science
  - Science and Engineering Practices
- DLM Science Assessments
- Instructional Resources
- Future Work



# DLM SCIENCE CONTENT



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# DLM Science Standards Framework

## Domains

- Life Science
- Physical Science
- Earth & Space Science

## Core Ideas

- 11 Core Ideas

## Topics

- 40 Topics

## Essential Elements & Linkage Levels

- Target
- Precursor
- Initial



# DLM Science States' Selected Topics for all Grade Spans

Physical Science	Life Science	Earth/Space Science
Structure & Properties of Matter	Structure & Function	Earth & the Solar System
Forces and Motion	Growth & Development	Earth Materials & System
Conservation & Transfer of Energy	Interdependent Relationships in Ecosystems	Weather & Climate
Wave Properties	Inheritance & Variation of Traits	Natural Resources
	Adaptation	Human Impacts on Earth Systems



# What are Essential Elements?

- Definition
  - The DLM Essential Elements (EEs) are specific statements of the content and skills that are linked to the Next Generation Science Standards (NGSS) as well as participating DLM states' current grade span-specific expectations for students with significant cognitive disabilities.



# What are Essential Elements?

- Purpose of DLM EEs:
  - To build a bridge from the content in the grade level science standards to academic expectations for students with the most significant cognitive disabilities (SWSCD)
- Reduced depth, breadth, complexity
- Are not functional or pre-K skills or instructional descriptions
- Provide appropriate level of rigor and challenge
- Focus on the skills (with multiple means of demonstration)



# What are Essential Elements?

- Example:

Frame-work Code	Grade Level Performance Expectation	EE Target Code	EE Target Level Description
5.PS.1.2	Measure & graph quantities to <b>provide evidence</b> that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.	EE.5.PS.1.2	<b>Measure and compare</b> weights of substances before and after heating, cooling, or mixing substances to show that weight of matter is conserved.





# DLM Essential Elements are NOT:

- Replacements for the general education grade level standards
- Downward extensions to pre-K
- Statements of functional skills
- Curriculum or learning progressions
- IEP goals or benchmarks



# Science and Engineering Practices (SEPs)

1. Asking questions and defining problems
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations and designing solutions
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information



# DLM SCIENCE ASSESSMENTS



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# DLM Science Assessments in Kansas

- Grade 5
- Grade 8
- Grade 11



# Linkage Levels - A Definition

- Linkage levels (LLs) contain one or more learning targets that precede an identified EE. Links both identify important milestones en route to an EE and specify where a student is in relationship to the grade-span target.
- Science currently has two linkage levels that precede the Target EE:
  - Precursor
  - Initial



# Linkage Levels

ELA & Math	Science
Initial	Initial
Distal Precursor	
Proximal Precursor	Precursor
Target	Target
Successor	



# Science Testlets

- Begins with engagement activity/science story
  - Motivate students
  - Provide a context
  - Activate prior knowledge
- Science Stories:
  - Longer stories presented twice; items embedded and at conclusion on 2<sup>nd</sup> read
  - Shorter stories and single topics presented once; items at conclusion



# Spring Assessment: Science

- Nine testlets
- Computer delivered testlets
  - Target and Precursor Levels
- Teacher administered testlets
  - Initial linkage level
- Testlet Information Pages (TIPS)
  - Print images prior to test administration
  - Gather required materials prior to test administration





# INSTRUCTIONAL RESOURCES



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# Instructional Resources

- [http://dynamiclearningmaps.org/content/erp\\_sci](http://dynamiclearningmaps.org/content/erp_sci)

## EDUCATOR RESOURCE PAGE FOR SCIENCE

for Alaska, Iowa, Illinois, Kansas, Miccosukee, Missouri, Oklahoma, West Virginia, and Wisconsin

Training for Test Administrators who will administer Dynamic Learning Maps science assessments is built into your state's Moodle training.

- Science Supplement to Test Administration Manual (pdf)
- Essential Elements for Science (pdf)
- Development of DLM Essential Elements for Science (pdf)  
*a short description of how Essential Elements in science were developed*
- Guide to Practice Activities & Released Testlets for Science (pdf) 08/02  
*familiarizes educators and students with testlets and KITE Client*
- Science Materials Collections for Spring 2016 (pdf) – *Coming 2017*

## Released Testlets and Sample TIPs

- Released Testlet Elementary 5.ESS3-1.T
- Released Testlet Middle School MS.PS1-2.I
- Released Testlet High School HS.PS2-3.P
- Sample TIP Elementary
- Sample TIP Middle School

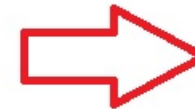
## Required Training

Required test administrator training for teachers participating in 2016–17 DLM testing is available on a state-driven schedule. The Guide to DLM Required Test Administrator Training (pdf) is a great place to start, with information about accessing the DLM Moodle training site for your first login.

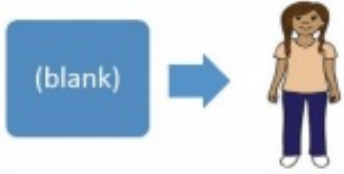
## Science Instructional Activities

The DLM Science Consortium developed three model science instructional activities that are intended to support teachers who are beginning to use the DLM Science Essential Elements during instruction. One activity for each grade span (Elementary, Middle, and High School) is located below.

EE.5.ESS1-2: The Daylight Hours  
EE.5.LS2-1: Food Cycles  
EE.5.PS3-1: Energy from the Sun  
EE.MS.ESS2-6: Weather Watchers  
EE.MS.LS2-2: What Animals Eat  
EE.MS.PS1-2: Chemical Changes



# Instructional Resources

<b>Target Level</b> Create a model that shows the movement of matter (e.g., plant growth, eating, composting) through living things.	<b>Precursor Level</b> Identify a model that shows the movement of matter from plants to animals (e.g. food chain/food web).	<b>Initial Level</b> Identify common human foods.	<b>Accessibility Considerations for Science and Engineering Practice</b> <ul style="list-style-type: none"> <li>• Access information through concrete pictures, physical scale models (e.g., tactile displays) and/or computer generated models.</li> <li>• Represent relationships with diagrams representing only the most relevant information.</li> </ul>
<b>Activity Title</b> Food Cycles	<b>Estimated Classroom Time Needed</b> One session	<b>Essential Questions</b> <ul style="list-style-type: none"> <li>• Does the student understand that the food of most animals can be traced back to plants?</li> <li>• Does the student understand that there is a cycle of matter that supports life?</li> </ul>	
<b>Suggested Materials</b> <ul style="list-style-type: none"> <li>• Story or description about an ecosystem</li> <li>• Pictures or tactile representations of animals from the story</li> <li>• Pictures or tactile representations of food and non-food items</li> <li>• Arrows to indicate direction of energy transfer</li> </ul> <p>The following website provides a list of books that may be used or adapted:  <a href="http://www.nsta.org/recommends/">http://www.nsta.org/recommends/</a></p>		<b>Engage Students in the Activity</b> Ask students questions such as, "What is food?" "Why do we need food?" Ask students about their favorite food. Explain that food gives living things the energy and material they need to grow and stay alive. Ask students to provide information they already know about food chains.  The following video explains why humans and animals need food: "Gotta Eat!" <a href="https://www.youtube.com/watch?v=z9TlM96lT8">https://www.youtube.com/watch?v=z9TlM96lT8</a>	
<b>Activity Description</b> <i>Define</i> (throughout activity): matter, movement of matter, food chain  <i>Step 1:</i> Students will be given a small model to complete that represents what humans eat. Give students pictures or tactile representations of food and non-food items to place or select that will complete the model. For example, give the student a picture or tactile representation of an apple and a picture or tactile representation of a pencil and have the student complete the model.			

# Instructional Resources

- List the EE and each linkage level
- Include examples and links to other resources
- Include a sample activity idea
- Include Ideas for differentiating instruction
- Checks for Understanding



# FUTURE WORK



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# Future Assessment System Work

- Development of future instructionally embedded science assessments
- Increase number of available testlets in the spring
- Further development of instructional resources

