

# Innovations in Science Map, Assessment, and Report Technologies (I-SMART)

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# I-SMART Purpose

Improve achievement of multidimensional science standards for students with and without disabilities through accessible, learning map model-based assessments and reporting tools.



# I-SMART Goals

Goal 1 - Develop & evaluate science learning map

Goal 2 – Design, develop & evaluate assessments

Goal 3 – Design, develop & evaluate a dashboard

Goal 4 - Dissemination

## State Partners

- Maryland – Lead State
- Missouri
- New Jersey
- New York
- Oklahoma

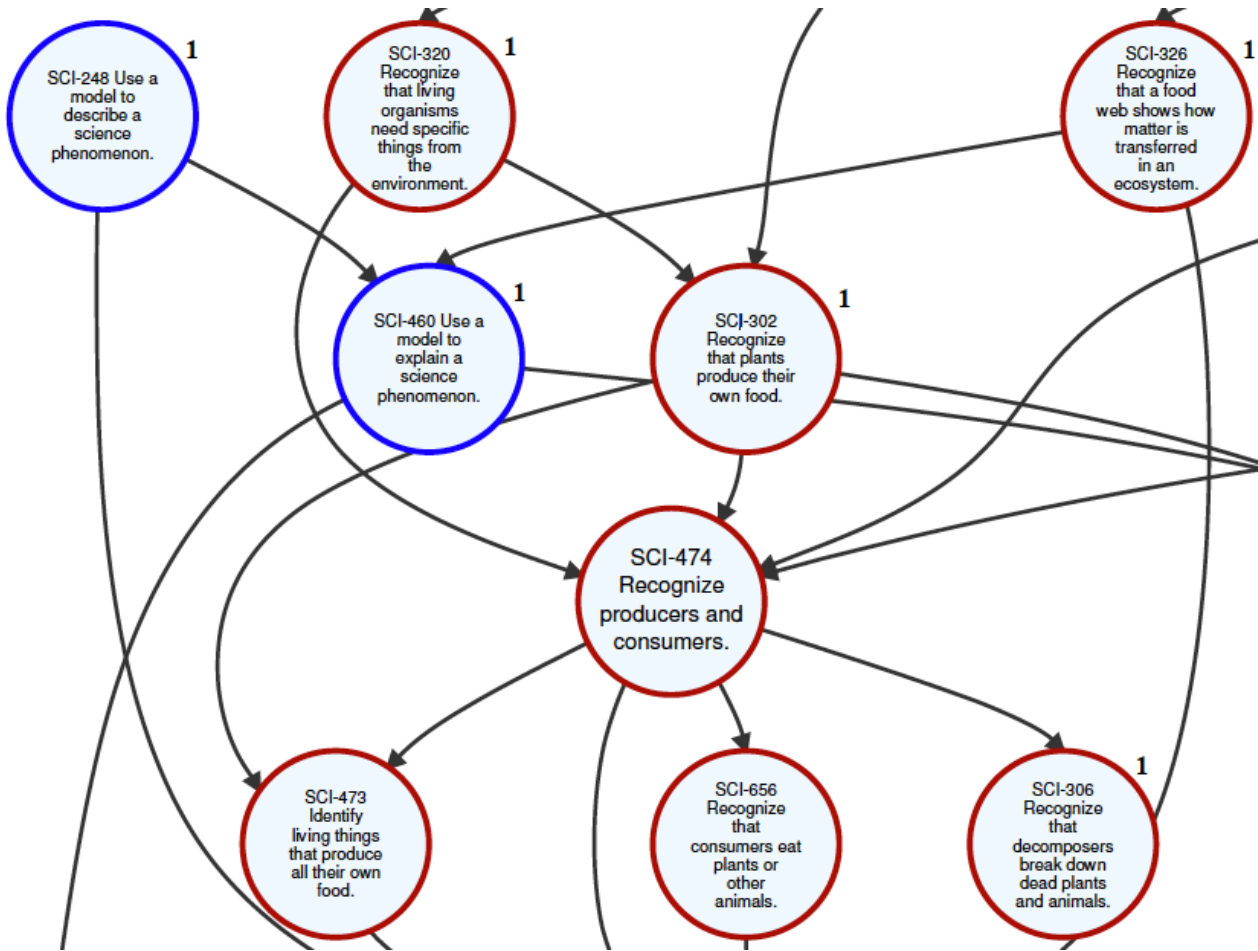
## I-SMART Team

- ATLAS - KU
- CAST
- Bruce Yelton, evaluator

# Goal 1

## Science Learning Map Model Development and Review





## Map Model Segment from Neighborhood Essential Element

**EE.MS.LS2-2:** Use models of food chains/webs to identify producers and consumers in aquatic and terrestrial ecosystems.

**Disciplinary Core Idea:**  
LS2.B Cycle of Matter and Energy Transfer in Ecosystems.

**Science and Engineering Practice (Blue Circles):**  
Developing and using models

# I-SMART Review Panel Process

- Onsite panel review with educators
- Panel review methodology, & post-panel review process
- External and internal evaluation of process



# Goal 2

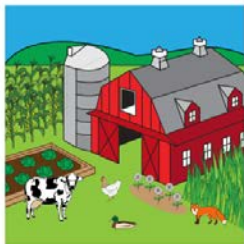
## Science Testlet Development



# Prototype Testlet Development

- Narrative, inquiry-based approach
- Incorporating principles of UDL
- Items developed to assess nodes in the map
- Items grouped into testlets built on "mini-progressions" of connected map nodes used as assessment targets in an essential element neighborhood
- Each mini-progression used as an assessment target includes DCI and SEP nodes

Lisa visits her grandfather's farm. Cows live on the farm. Many different animals live on the farm. Plants also grow on the farm.



BACK ←

NEXT →

Narrative-Based

I wonder...

Lisa knows plants grow on a farm. Lisa knows animals live on a farm. Lisa knows people work on a farm. Lisa knows that people take care of plants on the farm. Can plants survive without people?

No, plants need people to give them food.

Yes, plants can make their own food.

BACK ←

NEXT →

Includes Engagement Activities

# Upcoming testlet development activities

- Item tryouts (cognitive labs)
- Item-writing event with educators from states
- External review
- Pilot

# Goal 3

## Reporting Dashboard – Design Focus Groups



# Reporting Dashboards

**Provide immediate access to student data in an accessible, attractive, and engaging way that facilitates comprehension, insight, and instructional design-making.**

# Dashboard Design Cadre

- Focus groups of educators from states
- Began with needs assessment
- Included iterative process of design, feedback, updated designs

# Dashboard - Student View

View Another Student:

[Accessibility Supports >](#)

## Jane Snow's Dashboard

Essential Elements <a href="#">View List &gt;</a>	Instruction	Testlets		
		Initial	Precursor	Target
<a href="#">Chemical Changes</a>	EE.MS-PS-1	✓	✓	✓
<a href="#">Motion of Objects</a>	EE.MS-PS-2	✓	✓	✓
<a href="#">Energy</a>	EE.MS-PS-2	—	—	—
<a href="#">Organ Structure</a>	EE.MS-LS1	✓	✓	✓
<b>Food Webs</b>	EE.MS-LS-2	✓	✓	✗
<a href="#">Earth Systems</a>	EE.MS-ESS-2	✱	—	—
<a href="#">Human Impact</a>	EE.MS-ESS-3	—	—	—

Key: ✓ Mastery demonstrated ✗ Mastery not demonstrated  
Instruction: — not begun ✱ In progress ✓ Completed

EE-specific skills ○  
Science or engineering practice skills ○  
Direct path →  
Indirect path -.->

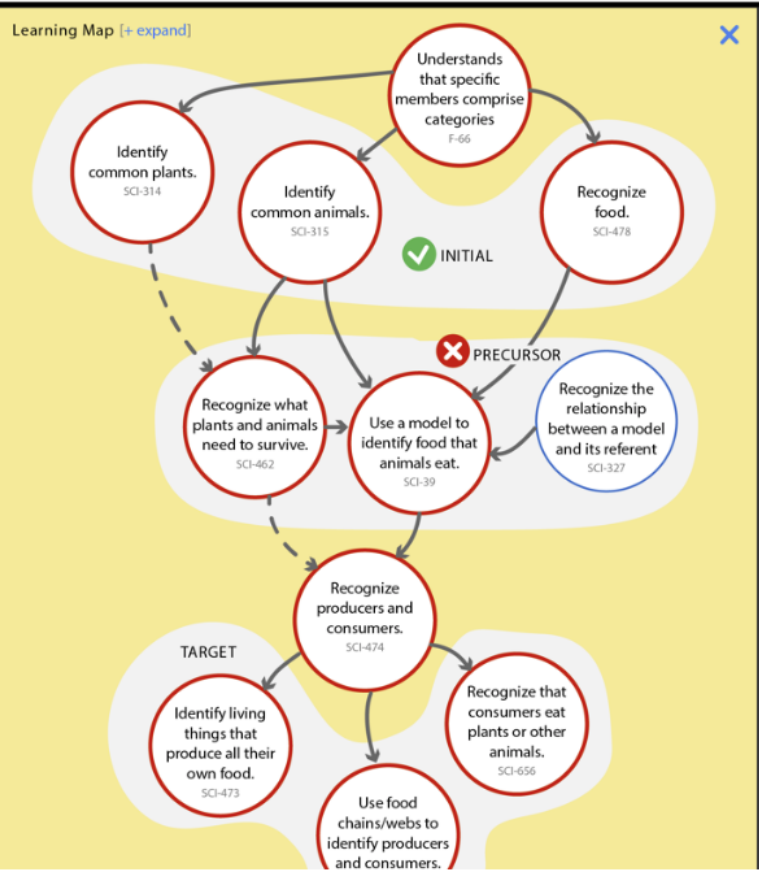
### Essential Element Details

**NGSS**  
Disciplinary Core Idea: LS2.B:  
[Cycle of Matter and Energy Transfer in Ecosystems >](#)

Science and Engineering Practice:  
[Developing and using models >](#)

**DLM Resources**  
[DLM Science Instructional Activity: Food Chains \(PDF\) >](#)

**Additional resources**



UDL-based - multiple ways to access information

One view of many dashboard screens.

# I-SMART State Perspective



Innovations in Science Map,  
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# I-SMART State Perspective

- **Maryland science assessment involvement**
- **Participation of educators across state partners**

# Maryland's Science Assessment Development



2013: Maryland adopts the Next Generation Science Standards (NGSS)

2015-2016: Students with significant cognitive disabilities take Alt-MSA Science

2016 – 2017: General Education students in grades 5 and 8 take the first year of Maryland Integrated Science Assessment (Alt-MISA).

2017-2018: MSDE adopts the Essential Elements

2017: Students with significant cognitive disabilities take Dynamic Learning Maps (DLM)



# Across State Partners

- **Educators have:**

- participated in the I-SMART review panel
- participated in the dashboard design cadres

- **Educators will:**

- participate in cognitive labs (occurring in MD and MO)
- participate in pilot activities
- participate in item writing activities

Questions?

# Contact Us...

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