

Science Essential Elements

An Introduction



DYNAMIC[®]
LEARNING MAPS



Wisconsin Science Standards & Next Generation Science Standards

Wisconsin Science Standards (WSS) are aligned to the Next Generation Science Standards. (NGSS)

If your district has adopted the NGSS,
you are doing the WSS.

The Science Essential Elements are
based on the NGSS.



Understanding the Format

These standards look nothing like the Common Core standards we are all used to!

2. Interdependent Relationships in Ecosystems		
2. Interdependent Relationships in Ecosystems Students who demonstrate understanding can: 3-LS2-1. Plan and conduct an investigation to determine if plants need sunlight and water to grow. [Assessment Boundary: Assessment is limited to testing one variable at a time.] 3-LS2-2. Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.* 3-LS4-1. Make observations of plants and animals to compare the diversity of life in different habitats. [Assessment Boundary: Assessment does not include specific animal and plant species in specific habitats.] <small>*The performance expectations above were developed using the following elements from the NRC document, A Framework for K-12 Science Education.</small>		
Science and Engineering Practices Developing and Using Models Modeling in K-2 builds on prior experiences and progresses to include using and developing models (e.g., diagrams, drawings, physical models, drawings, representations, or descriptions) that represent concrete models or design solutions. • Develop a simple model based on evidence to represent a proposed object or tool. [3-LS2-2] Planning and Carrying Out Investigations Planning and carrying out investigations to answer questions or test solutions to problems in K-2 builds on prior experiences and progresses to include investigations based on test plans, which provide data to support explanations or design solutions. • Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question. [3-LS2-1] • Make observations (firsthand or from media) to collect data which can be used to make comparisons. [3-LS4-1] Connections to Nature of Science Scientific Knowledge is Based on Empirical Evidence • Scientists look for patterns and order when making observations about the world. [3-LS2-1] Connections to DCI, CCE, and Crosscutting Concepts Introduction of DCI across gradebands: DCI.1 [3-LS2-1], DCI.2 [3-LS2-2], DCI.3 [3-LS2-2], DCI.4 [3-LS2-2], DCI.5 [3-LS2-2], DCI.6 [3-LS2-2], DCI.7 [3-LS2-2], DCI.8 [3-LS2-2], DCI.9 [3-LS2-2], DCI.10 [3-LS2-2], DCI.11 [3-LS2-2], DCI.12 [3-LS2-2], DCI.13 [3-LS2-2], DCI.14 [3-LS2-2], DCI.15 [3-LS2-2], DCI.16 [3-LS2-2], DCI.17 [3-LS2-2], DCI.18 [3-LS2-2], DCI.19 [3-LS2-2], DCI.20 [3-LS2-2], DCI.21 [3-LS2-2], DCI.22 [3-LS2-2], DCI.23 [3-LS2-2], DCI.24 [3-LS2-2], DCI.25 [3-LS2-2], DCI.26 [3-LS2-2], DCI.27 [3-LS2-2], DCI.28 [3-LS2-2], DCI.29 [3-LS2-2], DCI.30 [3-LS2-2], DCI.31 [3-LS2-2], DCI.32 [3-LS2-2], DCI.33 [3-LS2-2], DCI.34 [3-LS2-2], DCI.35 [3-LS2-2], DCI.36 [3-LS2-2], DCI.37 [3-LS2-2], DCI.38 [3-LS2-2], DCI.39 [3-LS2-2], DCI.40 [3-LS2-2], DCI.41 [3-LS2-2], DCI.42 [3-LS2-2], DCI.43 [3-LS2-2], DCI.44 [3-LS2-2], DCI.45 [3-LS2-2], DCI.46 [3-LS2-2], DCI.47 [3-LS2-2], DCI.48 [3-LS2-2], DCI.49 [3-LS2-2], DCI.50 [3-LS2-2], DCI.51 [3-LS2-2], DCI.52 [3-LS2-2], DCI.53 [3-LS2-2], DCI.54 [3-LS2-2], DCI.55 [3-LS2-2], DCI.56 [3-LS2-2], DCI.57 [3-LS2-2], DCI.58 [3-LS2-2], DCI.59 [3-LS2-2], DCI.60 [3-LS2-2], DCI.61 [3-LS2-2], DCI.62 [3-LS2-2], DCI.63 [3-LS2-2], DCI.64 [3-LS2-2], DCI.65 [3-LS2-2], DCI.66 [3-LS2-2], DCI.67 [3-LS2-2], DCI.68 [3-LS2-2], DCI.69 [3-LS2-2], DCI.70 [3-LS2-2], DCI.71 [3-LS2-2], DCI.72 [3-LS2-2], DCI.73 [3-LS2-2], DCI.74 [3-LS2-2], DCI.75 [3-LS2-2], DCI.76 [3-LS2-2], DCI.77 [3-LS2-2], DCI.78 [3-LS2-2], DCI.79 [3-LS2-2], DCI.80 [3-LS2-2], DCI.81 [3-LS2-2], DCI.82 [3-LS2-2], DCI.83 [3-LS2-2], DCI.84 [3-LS2-2], DCI.85 [3-LS2-2], DCI.86 [3-LS2-2], DCI.87 [3-LS2-2], DCI.88 [3-LS2-2], DCI.89 [3-LS2-2], DCI.90 [3-LS2-2], DCI.91 [3-LS2-2], DCI.92 [3-LS2-2], DCI.93 [3-LS2-2], DCI.94 [3-LS2-2], DCI.95 [3-LS2-2], DCI.96 [3-LS2-2], DCI.97 [3-LS2-2], DCI.98 [3-LS2-2], DCI.99 [3-LS2-2], DCI.100 [3-LS2-2]. Common Core State Standards Connections [3-LS2-1] [3-LS2-2] [3-LS4-1] 3-LS2-1 Participates in shared research and writing projects (e.g., read a number of books on a single topic to produce a report, record science observations). [3-LS2-1][3-LS2-2] 3-LS2-2 Recall information from experiments or gather information from shared resources to answer questions. [3-LS2-1][3-LS2-2] 3-LS4-1 Create audio recordings of stories or poems; add drawings or other visual displays to stories or records of experiences when appropriate to clarify ideas, thoughts, and feelings. [3-LS4-1] Assessment SEP.2 Reason abstractly and quantitatively. [3-LS2-1][3-LS2-2] SEP.4 Model with mathematics. [3-LS2-2][3-LS2-2][3-LS2-2] SEP.5 Use appropriate tools strategically. [3-LS2-2] 3-MS.B.10 Draw a picture graph and a bar graph (both single-unit scales) to represent a data set with up to four categories; solve simple problems, interpret, and compare problems. [3-MS.B.10.10.1]		
Disciplinary Core Ideas LS2.A: Interdependent Relationships in Ecosystems • Plants depend on water and light to grow. [3-LS2-1] • Plants depend on animals for pollination or to move their seeds around. [3-LS2-2] LS2.B: Biodiversity and Humans • There are many different kinds of living things in any area, and each needs different places or food and/or water. [3-LS2-2] ESS1.B: Developing Functional Models • Models can be compared through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solution to other people. [secondary 3-LS2-2]		
Crosscutting Concepts Cause and Effect • Events have causes that generate observable patterns. [3-LS2-2] Structure and Function • The shape and stability of structures of natural and designed objects are related to their functions. [3-LS2-2]		

Performance Expectations

Crosscutting Concepts

Disciplinary Core Ideas (DCI)

Science and Engineering Practices

Integration

3 Dimensions of the NGSS

Disciplinary Core Ideas (DCIs) - middle pink column, these are the “content” standards related to specific subject (life science, earth science, physical science)

Science and Engineering Practices (SEPs) - left “blue” column, Eight SEPs. The skills/process related to DOING science. DLM created an “abbreviated” science practices document.

Cross-Cutting Concepts (CCCs) - right green column, these are common concepts that go across ALL area of science and help to frame thinking. These are included but DE-EMPHASIZED by DLM.

Science and Engineering Practices

1. Asking questions (for science) and defining problems (for engineering)
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 (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

Cross-cutting Concepts

These are de-emphasized in the Essential Elements but are still referenced.

1. patterns;
2. cause and effect;
3. scale, proportion, and quantity;
4. systems and system models;
5. energy and matter;
6. structure and function;
7. stability and change.

Science Essential Elements are a SUBSET of NGSS

NGSS Document Performance Expectations:

Elementary = 78, Middle School = 59, High School = 71

Science Essential Elements Performance Expectations:

Elementary = 9, Middle School = 14, High School = 15

[NGSS EE Progressions Document](#)

The Essential Elements Document(s)

Wisconsin Essential Elements Green Book Structure

Structured differently than the NGSS, has many similar sections but important addition is the “Linkage Levels”

[Essential Element Structure Document](#)

Science Baseline Checklists

Selected Parts of the Essential Elements with possible activities and standard correlations.

[Life Science Draft Example](#)

How did we roll them out at WRPS?

Two Day Workshop Model

Agenda

Purposes of Workshop

1. Introduction to Essential Elements to BOTH EEN & Classroom Teachers.
2. Review of Essential Elements Baseline Checklists
3. **COLLABORATION between EEN and Classroom Teachers**

Activities/Assessment from DPI

Pilot Assessment for 5th Grade on Conservation of Matter and Particle Model.

1st Part Correlated to EE on Conservation of Weight (EE.5.PS1.2).

2nd Part for regular classroom students.

Part 1 - [Caramel Corn Conservation Activity/Assessment](#)

Part 2 - [Particles and Dissolving \(A 5th Grade performance Task\)](#)