Matrix of Oregon's K-12 Science Standards

This document provides a matrix that visualizes the integration of Crosscutting Concepts and Science and Engineering Practices across Oregon's K–12 Science Standards within each grade band. It can assist in the facilitation of standards implementation, instructional planning and coherence, as well as supporting a balanced assessment system.



The matrix supports the vision set forth in *A K–12 Framework Science Education* (National Research Council, 2012), which emphasizes the three dimensions—**Science and Engineering Practices**, **Crosscutting Concepts**, and **Disciplinary Core Ideas**—which together form the foundation of each science standard and outline what students should know and be able to demonstrate.

Dimension 1: Science and Engineering Practices (SEPs)

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

Dimension 2: Crosscutting Concepts (CCCs)

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

Dimension 3: Disciplinary Core Ideas (DCIs)

- **Earth and Space Science (ESS)**
  - **ESS1** . Earth's Place in the Universe
  - **ESS2** . Earth's Systems
  - **ESS3** . Earth and Human Activity
- **Engineering, Technology and the Application of Science (ETS)**
  - **ETS1** . Engineering Design
  - **ETS2** . Links Among Engineering, Technology, Science, and Society
- **Life Sciences (LS)**
  - **LS1** . From Molecules to Organisms: Structures and Processes
  - **LS2** . Ecosystems: Interactions, Energy, and Dynamics
  - **LS3** . Heredity: Inheritance and Variation of Traits
  - **LS4** . Biological Evolution: Unity and Diversity
- **Physical Science (PS)**
  - **PS1** . Matter and Its Interactions
  - **PS2** . Motion and Stability: Forces and Interactions
  - **PS3** . Energy
  - **PS4** . Waves and Their Applications in Technologies for Information Transfer

Matrix of Science Standards (Grades K-2)

	Patterns	Cause and Effect	Scale, Proportion and Quantity	Systems and System Models	Energy and Matter	Structure and Function	Stability and Change
Asking Questions and Defining Problems		K.ESS3.2					
Obtaining, Evaluating and Communicating Information	1.LS1.2 2.ESS2.3	K.ESS3.2 K.ESS3.3					
Planning and Carrying Out Investigations	1.ESS1.2 2.PS1.1	K.PS2.1 K.PS3.1 1.PS4.1 1.PS4.3 2.LS2.1					
Developing and using Models	2.ESS2.2			K.ESS3.1		K.2.ETS1.2 2.LS2.2	
Analyzing and Interpreting Data	K.ESS2.1 K.LS1.1 1.ESS1.1	K.PS2.2 2.PS1.2					
Using Mathematical and Computational Thinking							
Constructing Explanations and Designing Solutions	1.LS3.1	K.PS3.2 1.PS4.2			2.PS1.3	1.LS1.1	2.ESS1.1 2.ESS2.1
Engaging in Argument from Evidence		2.PS1.4		K.ESS2.2			

***A Crosscutting Concept is not present in these standards but aligns with the following Science and Engineering Practices:**

- 1.PS4.4 – Constructing Explanations and Designing Solutions
- 2.LS4.1 – Planning and Carrying Out Investigations
- K.2.ETS1.1 – Asking Questions and Defining Problems
- K.2.ETS1.3 – Analyzing and Interpreting Data

Matrix of Science Standards (Grades 3-5)

	Patterns	Cause and Effect	Scale, Proportion and Quantity	Systems and System Models	Energy and Matter	Structure and Function	Stability and Change
Asking Questions and Defining Problems		3.PS2.3			4.PS3.3		
Obtaining, Evaluating and Communicating Information	3.ESS2.2	4.ESS3.1		5.ESS3.1			
Planning and Carrying Out Investigations	3.PS2.2	3.PS2.1 4.ESS2.1 5.PS1.4	5.PS1.3		4.PS3.2		
Developing and using Models	3.LS1.1 4.PS4.1	4.PS4.2	5.PS1.1	4.LS1.2 5.ESS2.1 5.LS2.1	5.PS3.1		
Analyzing and Interpreting Data	3.ESS2.1 3.LS3.1 4.ESS2.2 5.ESS1.2		3.LS4.1				
Using Mathematical and Computational Thinking			5.ESS2.2 5.PS1.2				
Constructing Explanations and Designing Solutions	4.ESS1.1 4.PS4.3	3.LS3.2 3.LS4.2 4.ESS3.2			4.PS3.1 4.PS3.4		
Engaging in Argument from Evidence		3.ESS3.1 3.LS2.1 3.LS4.3 5.PS2.1	5.ESS1.1	3.LS4.4 4.LS1.1	5.LS1.1		

***A Crosscutting Concept is not part of these standards but aligns with the following Science and Engineering Practices:**

- 3.PS2.4 – Asking Questions and Defining Problems
- 3.5.ETS1.1 – Asking Questions and Defining Problems
- 3.5.ETS1.2 – Constructing Explanations and Designing Solutions
- 3.5.ETS1.3 – Planning and Carrying Out Investigations

Matrix of Science Standards (Middle School)

	Patterns	Cause and Effect	Scale, Proportion and Quantity	Systems and System Models	Energy and Matter	Structure and Function	Stability and Change
Asking Questions and Defining Problems		MS.PS2.3					MS.ESS3.5
Obtaining, Evaluating and Communicating Information		MS.LS1.8 MS.LS4.5				MS.PS1.3 MS.PS4.3	
Planning and Carrying Out Investigations		MS.ESS2.5 MS.PS2.5	MS.LS1.1 MS.PS3.4				MS.PS2.2
Developing and using Models	MS.ESS1.1	MS.LS3.2 MS.PS1.4	MS.PS1.1	MS.ESS1.2 MS.ESS2.6 MS.PS3.2	MS.ESS2.4 MS.LS1.7 MS.LS2.3 MS.PS1.5	MS.LS1.2 MS.LS3.1 MS.PS4.2	MS.ESS2.1
Analyzing and Interpreting Data	MS.ESS2.3 MS.ESS3.2 MS.LS4.1 MS.LS4.3 MS.PS1.2	MS.LS2.1	MS.ESS1.3 MS.PS3.1				
Using Mathematical and Computational Thinking	MS.PS4.1	MS.LS4.6					
Constructing Explanations and Designing Solutions	MS.LS2.2 MS.LS4.2	MS.ESS3.1 MS.ESS3.3 MS.LS1.5 MS.LS4.4	MS.ESS1.4 MS.ESS2.2	MS.LS1.3 MS.PS2.1	MS.LS1.6 MS.PS1.6 MS.PS3.3		
Engaging in Argument from Evidence		MS.ESS3.4 MS.LS1.4		MS.PS2.4	MS.PS3.5		MS.LS2.4 MS.LS2.5

***A Crosscutting Concept is not part of these standards but aligns with the following Science and Engineering Practices:**

- MS.ETS1.1 – Asking Questions and Defining Problems
- MS.ETS1.2 – Engaging in Argument from Evidence
- MS.ETS1.3 – Analyzing and Interpreting Data
- MS.ETS1.4 – Developing and using Models

Matrix of Science Standards (High School)

	Patterns	Cause and Effect	Scale, Proportion and Quantity	Systems and System Models	Energy and Matter	Structure and Function	Stability and Change
Asking Questions and Defining Problems		HS.LS3.1					HS.PS4.2
Obtaining, Evaluating and Communicating Information	HS.LS4.1	HS.PS4.4 HS.PS4.5			HS.ESS1.3	HS.PS2.6	
Planning and Carrying Out Investigations	HS.PS1.3	HS.PS2.5		HS.PS3.4		HS.ESS2.5	HS.LS1.3
Developing and using Models	HS.PS1.1	HS.PS3.5 HS.ESS2.4	HS.ESS1.1	HS.LS1.2 HS.LS1.4 HS.LS2.5	HS.PS1.4 HS.PS1.8 HS.PS3.2 HS.LS1.5 HS.LS1.7 HS.ESS2.3 HS.ESS2.6		HS.ESS2.1
Analyzing and Interpreting Data	HS.LS4.3	HS.PS2.1	HS.LS3.3				HS.ESS2.2 HS.ESS3.5
Using Mathematical and Computational Thinking	HS.PS2.4	HS.PS4.1 HS.LS4.6	HS.LS2.1 HS.LS2.2 HS.ESS1.4	HS.PS2.2 HS.PS3.1 HS.ESS3.6 HS.ETS1.4	HS.PS1.7 HS.LS2.4		HS.ESS3.3
Constructing Explanations and Designing Solutions	HS.PS1.2 HS.PS1.5	HS.PS2.3 HS.LS4.2 HS.LS4.4 HS.ESS3.1			HS.PS3.3 HS.LS1.6 HS.LS2.3 HS.ESS1.2	HS.LS1.1	HS.PS1.6 HS.LS2.7 HS.ESS1.6 HS.ESS3.4
Engaging in Argument from Evidence	HS.ESS1.5	HS.LS2.8 HS.LS3.2 HS.LS4.5		HS.PS4.3			HS.LS2.6 HS.ESS2.7

***A Crosscutting Concept is not part of these standards but aligns with the following Science and Engineering Practices:**

- HS.ESS3.2 - Engaging in Argument from Evidence
- HS.ETS1.1 – Asking Questions and Defining Problems
- HS.ETS1.2 – Constructing Explanations and Designing Solutions
- HS.ETS1.3 – Constructing Explanations and Designing Solutions