The Consortium
Alberta Professional Learning Consortium

Cultivating the Science Classroom as an Ecological Community – A Walkthrough

Summer Symposium
August 18, 2025

Land Acknowledgement

In the spirit of reconciliation, we want to acknowledge that this gathering is taking place on traditional lands across the province of Alberta, home to many diverse First Nations, Métis and Inuit peoples. We acknowledge that this land is a traditional meeting ground giving voice to its original peoples and the story of creation of this country in a way that history has forgotten.

Honourable Harvest - Robin Kimmerer

Indigenous Culture Based Learning in Alberta Curriculum

Agenda

- "Can a science classroom function like an ecosystem—interconnected, dynamic, and full of life? Absolutely! “

Supporting every educator in every classroom

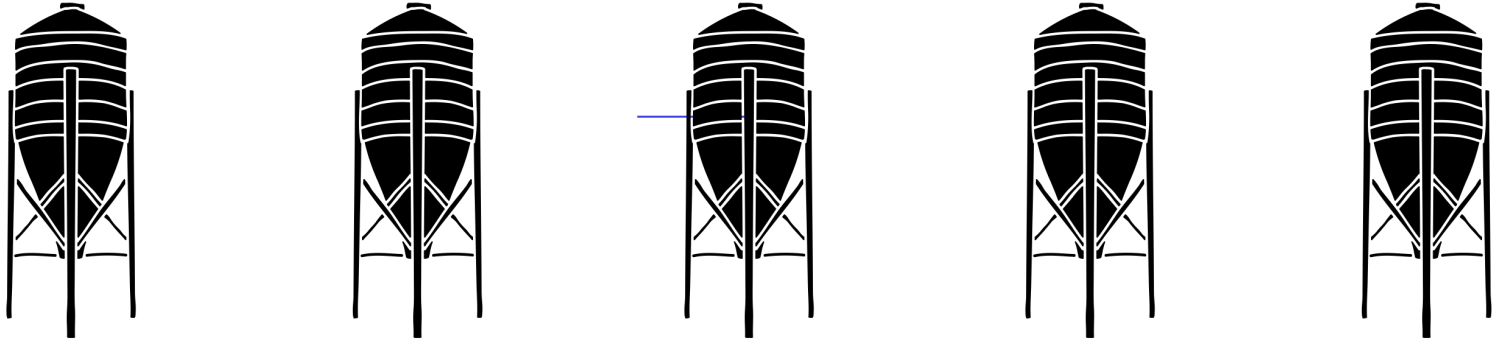
Key Learning Outcomes for Administrators

- Explore essential "look-fors" and "listen-fors" in a science classroom grounded in the new Alberta K-6 science curriculum.
- Understand how to identify evidence of high-standard student learning in science, even in a non-evaluative setting.
- Connections to Learning Progressions.
- Reimagine the science classroom as a dynamic, interconnected environment where curiosity, relationships, and learning flourish and is connected in progressive concepts.

The Thriving Science Classroom: An Ecosystem of Learning - Freepik

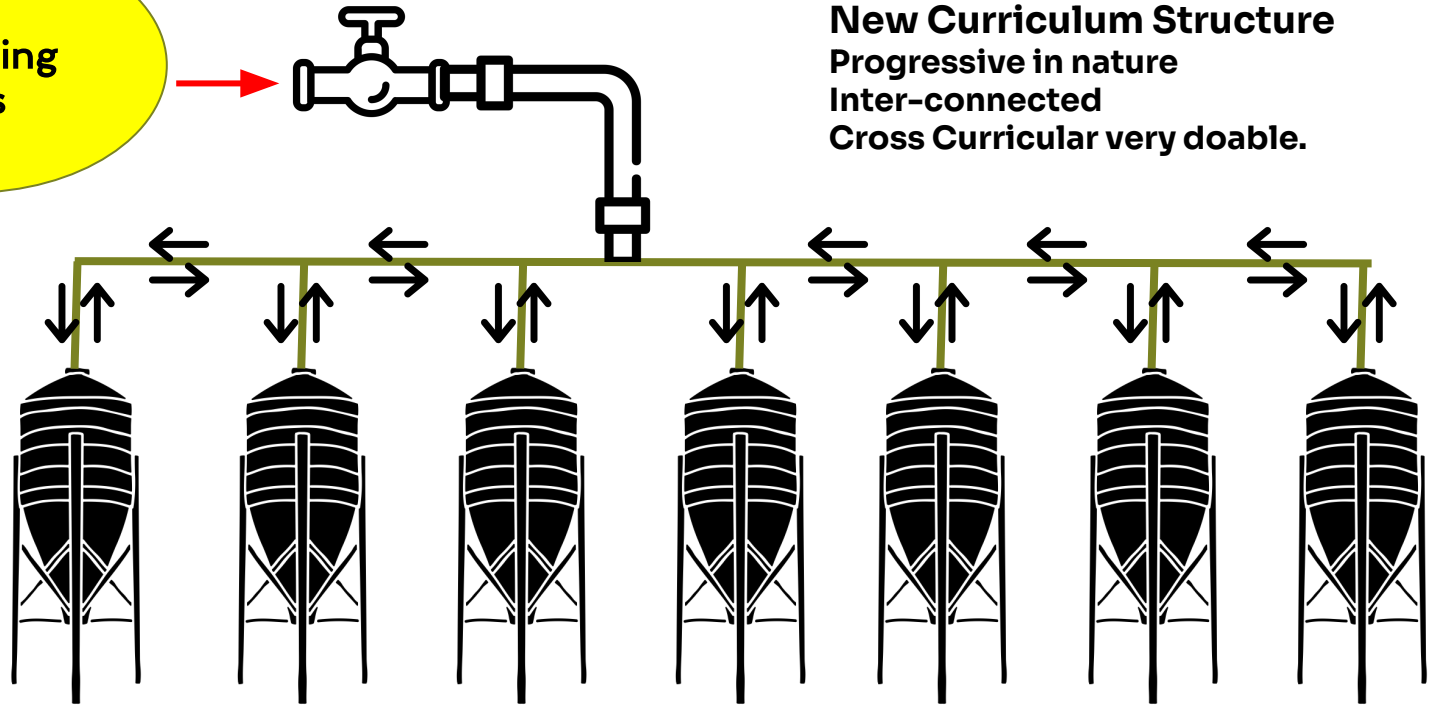
Previous Science Curriculum: Topics

Silos



GR. 1	Seasonal Changes	Needs of Animals and Plants	Creating Colour	Building Things	Senses
GR. 2	Small Crawling and Flying Animals	Buoyancy and Boats	Magnetism	Exploring Liquids	Hot and Cold Temperature
GR. 3	Building with a Variety of Materials	Testing Materials and Designs	Rocks and Minerals	Hearing and Sound	Animal Life Cycles
GR. 4	Building Devices and Vehicles	Light and Shadows	Plant Growth and Changes	Waste and Our World	Wheels and Levers
GR. 5	Electricity and Magnetism	Mechanisms using Electricity	Classroom Chemistry	Weather Watch	Wetlands Ecosystems
GR. 6	Air and Aerodynamics	Flight	Sky Science	Evidence and Investigation	Trees and Forests

Organizing Ideas



New Curriculum Structure

Progressive in nature
Inter-connected
Cross Curricular very doable.

Matter | **Energy** | **Earth Systems** | **Living Systems** | **Computer Science** | **Space (Gr. 4-6)** | **Scientific Methods (Gr. 1-6)**

Why a Walkthrough?

Ensemble Learning

Who benefits?

Why Non-Evaluative Walkthroughs?

Supporting every educator in every classroom

- **Primary Benefits:** Building strong professional ***relationships*** with teachers (and students) and providing decisional information for instructional leaders.
- **Modest Expectations:** For brief visits, expectations for feedback should be modest, focusing on observation rather than immediate critique.
- **Goal:** To be **present** and **pleasant.** The initial cycles of walkthroughs should involve no notes. Agree on what the walkthroughs look like **with your staff**.
- **Frequency & Duration:** Research: Aim for **frequent** (e.g., 3 classrooms a day, seeing every teacher bi-weekly), **brief** (5-15 minutes, ideally 10 minutes), and **substantive** visits. This approach yields a truer picture of typical practice than formal observations alone.
- **Focus:** The most important thing to focus on is the teacher's **instructional purpose**: "What's this lesson about? What is the teacher trying to accomplish? What is the teacher doing, what are the students doing, and how does that fit with the teacher's purpose?"
- Consider where the students are at in the *Phases* and *Progression* of Learning.

Decoding the Architecture of the Alberta K-6 Science Curriculum

Organizing Ideas: The curriculum is structured around "Organizing Ideas" such as Matter, Energy, Earth Systems, Living Systems, Computer Science, and Scientific Methods.

Guiding Questions: Each organizing idea is explored through "Guiding Questions" that frame learning outcomes (e.g., "How can properties of an object be distinguished from one another?", "How do plants and animals survive?").

Learning Outcomes: Specific "Learning Outcomes" are defined for each grade level (e.g., KM 1, 1M 1.1, 2M 1.1, 3M 1.1, etc.) detailing what students should know, understand, and be able to do.

Phenomena-Based Learning: Science instruction has shifted from passive knowledge transmission to an **active, inquiry-based, sense-making experience** for students.

- **Phenomena:** "Occurrences in the natural and human-made world that can be observed and cause one to wonder and ask questions". They should ideally have local relevance and spark curiosity.
- **Student Focus:** The instruction focuses on students "figuring out" solutions, answers, or scientific explanations related to phenomena, AND

	Grade 5		
Organizing Idea	Matter: Understandings of the physical world are deepened by investigating matter and energy.		
Guiding Question	How can states of matter and other physical properties be explained using the particle model of matter?		
Learning Outcome	Students investigate the particle model of matter in relation to the physical properties of solids, liquids, and gases.		
	Knowledge	Understanding	Skills & Procedures
	Ideas represented by the particle model of matter include that: • all matter is made up of small particles • particles of matter are always moving • particles of matter have spaces between them In solids, the particles are close together and vibrate in place. In liquids, the particles are separated by spaces and can slide past each other. In gases, the particles are separated by large spaces and are constantly moving in all directions. Attractive forces between particles are strongest in solids and weakest in gases.	The particle model of matter explains the behaviour of particles in matter.	Represent solids, liquids, and gases using the particle model of matter. Relate the movement and arrangement of particles to the state of matter. Describe the impact that attractive forces have on the movement and arrangement of particles in solids, liquids, and gases.

Link

Project Based Learning

Three-Dimensional (3D) Learning: instruction integrates three dimensions:

- **Disciplinary Core Ideas :** Fundamental scientific ideas in physical, life, Earth/space science, and engineering.
- **Crosscutting Concepts :** Ways of linking different science domains (e.g., patterns, cause and effect, systems and models).
- **Science and Engineering Practices :** Behaviors scientists and engineers engage in (e.g., asking questions, developing models, planning investigations, analyzing data, constructing explanations).

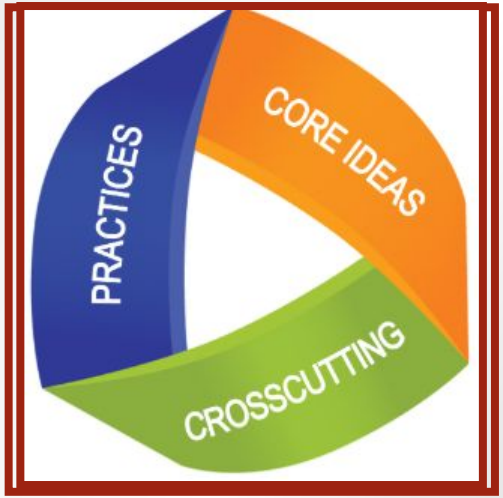
Integration: Science concepts ***build coherently across grade levels***, and the curriculum encourages the interconnected nature of science as practiced in the real world, aligning with literacy and numeracy standards. Students need multiple exposures to examples.

Surface → **Deep** → **Transfer**

Look-Fors in Instructional Practice

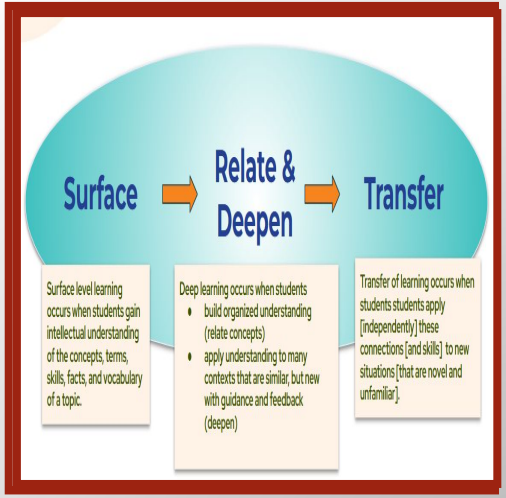
Phenomena -Based Instruction

Anchored Learning
Engagement
Content-Rich Experiences



3D Learning

Next Generation Science Standards - 3D Learning Model Builder
STEM - Cross Cutting (Curricular)



Concept and Learning Progression

Using Learning Progressions to Guide Teaching
Using the 5E Model
Supporting Science Teachers In Creating Lessons With Explicit Conceptual Storylines

The Ecosystem's Communication: "Listen-Fors"

Student Discourse

Meaningful Conversations: Students are engaged in meaningful authentic conversations about the science they are visibly working on.

Asking Questions: Students ask questions to solidify their thinking. They develop and ask questions of the teacher and other students to modify their understanding of the three dimensions.

Comparing /Trying Out Ideas: Students compare ideas and strategies with peers. They question the thinking of their peers, clarify their own ideas, reasoning, and explanations.

Dreamstime ID 74844293

Teacher Questioning Strategies

Eliciting & Challenging: Teacher sequences questioning strategies to elicit, support, and challenge scientific thinking. Questions push students to engage in sense-making and productive discourse. (DoK levels)
Depth & Justification: Teacher asks questions to understand and deepen student thinking, requiring them to explain their reasoning. Emphasis is on students doing the explaining, not the teacher.(DoK levels)
Scaffolding Vocabulary: Teacher scaffolds questioning to assist student understanding of scientific vocabulary with just-in-time support.
Relates Concepts in questions/Direct Assessment Questions/ Wait Time.

Your turn!

What words, phrases r cues would you Listen For to indicate that students are learning deeply?

Principal Classroom Observation and Conversation Guide – Science

Note: This observation checklist is meant to provide options for growth, with the idea of focusing on selected components within a category. Ideally, the selected components will align with your school's education plan.

Principal Classroom Observation and Conversation Guide - Science

EQUITY		
Questions to Consider	**Look Fors**	**Conversation Starters**
How are supportive relationships between students and the teacher being fostered regardless of students' racial, ethnic, linguistic, gender, and socioeconomic background?	• All students feel safe, welcome, and comfortable in the classroom. • Safe space for taking scientific risks and trying out ideas. • Students share, honor, listen to, and critique each other's ideas respectfully. • Students consider and discuss each other's thinking. • Highlights scientific thinking and values mistakes as learning opportunities.	How do you intentionally create a community of trust in your science classroom?
How are learners meaningfully engaged and respected in science?	• The learning environment honors diverse cultures, languages, and worldviews, possibly through varied examples of science in society or traditional knowledge. • Students are provided with meaningful connections to their learning, often through real-world phenomena or problems. • Additional resources and supports are provided for students where needed (e.g.,	What are some examples of how you have embedded diverse perspectives or local contexts in your science classroom? How do you encourage students to show their unique scientific perspectives?

Link

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APLC Post Session Survey

Thank you for attending this session. To help us enhance the delivery of future sessions, we ask that you complete this short survey. **Your feedback is important and appreciated!**

Note: Your survey will be submitted anonymously.

Survey: https://aplc.ca/survey/?id=15077

Thank you

Please visit our website for more information

Slide Deck

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