McGill | Faculty of Education | Department of Integrated Studies in Education

We gather together on land which has long served as a site of meeting and exchange amongst Indigenous peoples, including the Haudenosaunee and Anishinabeg nations. McGill University honours and respects the diverse Indigenous peoples connected to this territory on which we meet.

Elementary School Science 1

COURSE INFORMATION

Course #	EDEE 270
Term /Year	Fall 2023
Number of credits	3
Course location:	EDUC 360
Course time	11:35 AM -2:30 PM
Office hours	Wednesdays 4-5 PM on Zoom (link on myCourses) or by appointment with instructor/TA

SECTION INFORMATION

Section	001, 003, 004 Tues, Thurs, Fridays	002 PIF Wednesdays
Instructor	Emily Sprowls	TBD
E-mail	Emily.Sprowls@McGill.ca	x@McGill.ca

OTHER CONTACTS

Lab Technician	Jennifer Wallace	Teaching Assistants	TBD
E-mail	Jennifer.Wallace@McGill.ca	**E-mail**	x@mail.McGill.ca

COURSE OVERVIEW

- A focus on science as a means of exploring and explaining our environment.
- A study of some of the fundamental science concepts and process skills common to most elementary education programs.

Elementary School Science is a course for prospective elementary school teachers who will teach several subjects including science. It focuses on the **development of science knowledge and understanding**, as well as research-based **instructional practices for teaching science**. In preparation for classroom implementation, science teaching methods and materials will also be addressed. In this way, the course mirrors the mathematics course in which you may also be enrolled this semester.

This is the first course in a two-course sequence designed to help you teach science at the elementary level. Together, both courses will cover fundamental scientific concepts common to most elementary

science programs, with particular attention to the Québec Educational Program. These courses seek to help you develop science pedagogical strategies and build content understanding through experiential science learning and teaching rehearsals. The first course (EDEE 270) uses the lens of sustainability to address the interdisciplinary and social implications of science education. The second course (EDEE 273) will elaborate on interdisciplinary methods through science, technology, engineering, arts, and mathematics (STEAM) education with the aim of integrating science into a holistic approach to teaching and learning in elementary school.

LEARNING OUTCOMES

This course is designed to help prospective teachers gain the necessary knowledge, skills, and confidence to enable them to explore science topics with elementary students inside and outside the formal classroom setting. To achieve this goal, students will have the opportunity to explore science as a way of knowing the world and as a tool for problem solving. They will be actively engaged in doing and teaching science, as well as talking and reading about elementary science instruction that considers students' diverse backgrounds and fosters curiosity. They will have opportunities to connect practices of science to interdisciplinary sustainability topics, and to reflect on their role as teachers to connect science to their students' everyday lives and real-world issues.

The aims of this course reflect the cognitive, psychomotor, and affective learning outcomes that contribute to competencies in learning and teaching science and sustainability. Specifically, through this course, students will develop their abilities to:

Cognitive (HEAD)	▪ Develop critical understanding of scientific content and process in order to situate elementary school science in broader global and real-world sustainability contexts. ▪ Examine and evaluate experiential and learner-relevant elementary science pedgogies through the lens of sustainability. ▪ Explore how elementary science curricula connect with other disciplines and examine how these connections inform sustainability pedagogy and content.
Psychomotor (HANDS)	▪ Plan and implement lessons that connect science with real-world sustainability issues. ▪ Rehearse and enact high-quality science teaching practices informed by diverse scientific thinkers. ▪ Collaborate with students and teachers in learning communities and reflexively engage in experiences learning and teaching science.
Affective (HEART)	▪ Reflect on science identities to examine how personal experiences and perspectives inform science teaching and learning, and recognize ways to support productive dispositions toward science. ▪ Feel prepared to engage with real-world, socio-scientific sustainability issues that elementary students care about. ▪ Value and support actions required to address the historical and persistent challenges to equity, diversity, and inclusion in science.

QUEBEC MINISTRY OF EDUCATION COMPETENCIES

Through participation in this class, students will reinforce their subject-specific competencies in Science & Technology :

- To explore the world of science and technology
- To propose explanations for or solutions to scientific or technological problems.
- To make the most of scientific and technological tools, objects and procedures.
- To communicate in the languages used in science and technology.

Through the lens of sustainability, students will engage in the Broad Areas of Learning outlined in the Quebec Education Program for elementary students, with particular focus on the following aims as they correspond to the United Nations Sustainable Development Goals:

- Environmental awareness
- Health and well-being
- Citizenship and community life

Students will also develop the following core professional competencies for the teaching profession, as stated by the Quebec Ministry of Education:

1: **Act as a cultural facilitator when carrying out duties**

- This competency shapes all aspects of the course and is addressed through consideration of interactions between science and the social world. Students will be encouraged to develop critical thinking, perspective, and reflexivity with respect to their environment and to scientific phenomena. Students will also reflect on cultural practices of science through attention to the *Nature of Science* and consideration of sustainability.
- This competency will be demonstrated in responses to course readings, class activities and the E-portfolio.

2: **Master the language of instruction**

- As all teachers are models of language, students will be held to a high standard of professional language in English or French. All course related work should be structurally coherent and free of grammatical and typographical errors that interfere with meaning.
- Given the development and assessment of Professional Competency #2, all assignments for this course must be completed and submitted in French in the case of B.Ed. K/Elem PIF students.

3: Plan teaching and learning situations

- In a complex task assignment, students will develop a protocol for a learning situation that will enable students to progress in the development of their science competencies.
- This competency will be demonstrated in the Cycle of Enactment and E-portfolio.

4: Implement teaching and learning situations

- Students will learn to carry out learning tasks through rehearsing teaching situations. By enacting

lessons, they will practice detecting teaching/learning situations that arise and using the appropriate resources to approach them.
- This competency will be demonstrated in the Cycle of Enactment.

5: Evaluate learning
- Students will experience and practice formative evaluation of science learning during class activities, discussions, and response assignments.
- This competency will be assessed in EDEE 273: Elementary School Science 2.

6: Manage how the class operates
- Students will experience various approaches to managing experiential learning and hands-on science inquiry in and out of the classroom. They will practice classroom management in lesson rehearsal and enactments.
- This competency will not be assessed in this course.

7: Take into account student diversity
- Course readings and resources strive to model representation of diversity in science. Students will be expected to reflect on the role of their own identities in learning science, and how this can be applied to their teaching practices. Students will also be asked to reflect on the ways that hands-on, experiential nature of course activities may require them to adapt to their own diverse learning needs, and how this can be applied to adapt lesson design.
- This competency will be assessed in the lesson protocol of the Cycle of Enactment.

8: Support students love of learning
- This competency drives all aspects of the course through fostering student engagement and exploration of science and sustainability questions. By grounding the main course assignments in scientific phenomena and sustainability issues of interest to students themselves, students both have the opportunity to rediscover their own love of learning and to practice cultivating lifelong learning for themselves and their students.
- This competency will be demonstrated in the E-portfolio.

9: Be actively involved as a member of the school team
- Students are expected to be actively involved in group activities and open discussions in class.
- This competency will be demonstrated in responses to class activities and peer feedback in Critical Friends Groups.

10: Co-operate with the family and education partners in the community
- Students will engage with guest speakers from McGill's Faculty of Science and Montreal area school boards. Students may also have the opportunity to visit community science education institutions.
- This competency will be demonstrated in responses to class activities.

11: Commit to own professional development and to the profession
- Students will reflect on and assess their development as science teachers and identify specific areas for improvement. Students will also be expected to discuss pedagogical choices with their instructor and colleagues and work collaboratively with their peers to improve each other's practices.
- This competency will be demonstrated in Critical Friends Groups during the Cycle of Enactment.
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12: Mobilize digital technologies

- Students will collaborate and community via digital technologies throughout the course. Students will also reflect critically on pedagogical choices about when to mobilize digital technologies in the science classroom in balance with hands-on, multi-sensory, real-world learning experiences of natural phenomena.
- This competency will be demonstrated in the E-portfolio.

13: Act in accordance with the ethical principles of the profession

- Students will examine and critically reflect on ways that scientific knowledge and the practice of science produce or reproduce situations of exclusion and discrimination in education settings. In this course will work together to create and adopt equitable, transparent, and inclusive practices that build relationships for learning science.
- This competency will not be assessed in this course.

15: Value and promote Indigenous knowledge, worldviews, cultures, and history.

- In this course, students and instructors alike will work to develop richer understanding of science through learning both Indigenous science and Western or Eurocentric science practices. We will engage with land-based learning and Indigenous pedagogies, and consider ways that Indigenous ways of knowing and scientific knowledge can exist alongside and contribute to each other.
- This competency will be demonstrated in responses to course readings and class activities.

INSTRUCTIONAL METHODS

In developing professional teaching competencies, we will take as a guide the following **principles** of high-quality teaching. We will be working on developing your proficiency in the following **practices** of high-quality teaching throughout this course.

Principles of High-Quality Teaching[1]	Cross-Disciplinary Practices of High-Quality Teaching

• Children are sensemakers.
• Ambitious instruction requires clear instructional goals.
• Teachers must know their students as individuals and as learners.
• Teachers must design instruction and a learning environment that supports *all* children to do rigorous academic work in school and to have equitable access to learning.
• Teachers must be responsive to the requirements of the school environment. At the same time, teachers should consider why schools function as they do and how schools might improve.
	• Teaching toward an instructional goal
	• Eliciting and responding to student thinking
	  ○ Pressing on student thinking
	  ○ Revoicing student thinking
	• Orienting students to each other's ideas
	• Positioning students competently
	• Establishing and maintaining expectations for student participation
	• Representing student thinking and key ideas
	• Using a public record of student thinking

Principes d'enseignement de haute qualité	Pratiques enseignantes transdisciplinaires de haute qualité

• Les enfants sont des constructeurs de sens.
• Un enseignement ambitieux nécessite des intentions d'apprentissage claires.
• Les enseignants.es doivent connaitre leurs élèves à la fois comme des individus et des apprenants.
• Les enseignants.es doivent concevoir des situations d'apprentissage pour tous les élèves afin que ceux-ci puissent faire un travail académique rigoureux à l'école et avoir un accès équitable à l'apprentissage.
• Les enseignants.es doivent être réceptifs.ves aux besoins du milieu.
	• Enseigner en fonction des intentions d'apprentissage.
	• Solliciter le raisonnement des élèves et y répondre :
	  ○ Creuser l'idée de l'élève.
	  ○ Redire l'idée de l'élève.
	• Orienter les idées des élèves envers les idées des autres élèves et selon les intentions d'apprentissage.
	• Positionner les élèves de façon compétente.
	• Établir et maintenir des attentes pour la participation des élèves.
	• Représenter les concepts et les stratégies/raisonnements sciences des élèves.
	• Utiliser un registre des idées des élèves.

5E Instructional Model

The primary instructional model that will guide our science learning and teaching in this course is the inquiry-based approach of the 5E instructional model (Bybee, 2015). The 5E Model allows students to understand a scientific concept over time through a cycle of learning phases: Engage, Explore, Explain, Elaborate, and Evaluate.

Cycle of Enactment and Investigation

The process that will guide our pedagogical practices is the Cycle of Enactment and Investigation.

REQUIRED COURSE MATERIALS

A list of readings and resources is appended to this syllabus. Required readings and course materials will be provided electronically via MyCourses. Students will also receive lab manuals to use in class. Additional resources such as textbooks, activity kits, and children's science literature are available in on the first floor of Education building in the Learning Commons at the library's Education Resource Center.

[1] We have borrowed (and in some cases, adapted) these principles and practices from the Learning Teaching in, from, and for Practice Project (http://www.teachingworks.org).

COURSE SCHEDULE and CONTENT

Please refer to myCourses for specific dates and deadlines for each section.

Although the instructor will attempt to comply with this course schedule as much as possible, please note that it is subject to change as it will be adapted to meet students' needs as the course develops.

Class	**Topics**	Science content	Assignments due
1	**Nature of science**	Observation & inference	
2	**Engaging students' ideas about natural phenomena***	Seasonal changes	**Reading response 1:** *Science practices* Sign up for Cycle of Enactment topic and group
3	**Exploring science questions through experimentation**	Properties of water	**Reading response 2:** *Scientific process*
4	**Explaining scientific data using Claims- Evidence-Reasoning**	Water cycle	**Reading response 3:** *Indigenous science*
5	**Science in the context of Quebec***	Classification	**Cycle of Enactment**: Lesson protocol draft
6	**Scientific models and hypotheses**	Transformations of living things: Plants (part 1)	
7	**Cycle of Enactment & Investigation**		**Cycle of Enactment**: Teaching rehearsal videos
8	**Scientific collaboration**	Transformations of living things: Plants (part 2)	**Reading response 4:** *Science identities*
9	**Science talk and productive questions**	Transformations of living things: Reproduction	***Reading response 5:*** *Scientific inquiry*
10	**Inquiry-based instruction**	Transformations of living things: Earthworms	**Cycle of Enactment**: Lesson protocol revisions
11	**Science beyond the classroom***	(Will vary according to guests for each section)	
12	**Cycle of Enactment & Investigation**		**Cycle of Enactment:** Teaching enactments
13	**Science in the community***	Transformations of living things: Evolution	**Cycle of Enactment**: Reflection on teaching
			E-portfolio

**These class sessions may involve going outdoors or to another location on campus, depending on weather and availability. Updates will be posted as Announcements in myCourses.*

EVALUATION/ASSESSMENT

All assignments must be submitted electronically to MyCourses and on time. If you have extenuating circumstances that keep you from turning in an assignment on time, it is your responsibility to contact your instructor before the due date to make alternative arrangements. At the discretion of the instructor, an assignment turned in late without previous arrangement may not receive feedback and may be subjected to a penalty in the form of a decrease in the total percentage value of the assignment.

For each assignment, please put your name, title of the assignment, and date at the top and include page numbers. Assignments that have been submitted for another course cannot be accepted. Up to ten percent (10%) of a grade could be subtracted for poor grammar, syntax, spelling, or punctuation if it interferes with ability to communicate ideas.

Assignment templates and guidelines with scoring rubrics will be provided on myCourses and reviewed in class.

Assessment	Percentage	Description
Responses to course readings	25%	Most weeks, you will be asked to read articles related to the themes of the class. In order to help you reflect on key concepts and to prepare for class discussion, you will be expected to respond to 5 of these course readings (5% each).
Responses to class activities	20%	In order to assess your understanding of course content and concepts, you will be expected to respond to class activities. After each class, there will be a set of questions related to the material covered. The goal of responding to those questions is to help you reflect on key concepts and theories. Over the course of the term, you will have to respond to 10 question sets (2% each).
Cycle of Enactment and Investigation (CEI)	40%	This assignment will be done in groups of 2-3 and include the following steps: ▪ Plan a science activity by completing a lesson protocol as a group (10%) ▪ Revise and resubmit protocol (15%) ▪ Rehearse the activity (ungraded) ▪ Review the video in a Critical Friends Group (5%) ▪ Reflect on the rehearsal individually (10%)
E-portfolio	15%	For the final assignment you will showcase your lesson protocol and curate your key learnings about teaching science and sustainability. The goal of the science section in your E-Portfolio is to provide you an opportunity to reflect on your identity and philosophy of teaching and learning science, and your positionality in your approach to sustainability education. In creating your Science teaching portfolio, you should incorporate ideas developed in your reading reflections and responses to course materials. (Please note that this assessment will be further elaborated at the end of *EDEE 273: Elementary School Science 2*).

In the event of extraordinary circumstances (ex.: pandemic), the evaluation scheme in this course is subject to change.

To meet the course requirement, students must complete all assignments and other course requirements as set forth. Final grades for this course will be assigned in accordance with McGill University grading policy and guidelines.

Undergraduate Grading and Grade Point Averages (GPA)

GRADES	Grade Points	Numerical Scale of Grades
A	4.0	85-100%
A-	3.7	80-84%
B+	3.3	75-79%
B	3.0	70-74%
B-	2.7	65-69%
C+	2.3	60-64%
C	2.0	55-59%
D(Conditional) Pass)	1.0	50-54%
F (Fail)	0	0-49%

Additional Grade Options (must be approved by ISA):
J: unexcused absence (failed); the student is registered for a course but does not write the final examination or do other required work; calculated as a failure in the TGPA and CGPA
K: incomplete; deadline extended for submission of work in a course (K contract must be submitted, signed by student and instructor.

DISE Undergraduate Grading Scheme with Suggested Criteria

A (exceptional): Expectations of the assignment have been surpassed and demonstrate creativity and originality. Work shows in-depth understanding and critical awareness of links between the individual assignment and other class readings and activities, in line with the goals and major themes of the course itself and goes beyond the course content and material. Language and format of the work are exceedingly well-structured, eloquent and error free.

A- (very good): Understandings and insights in the work are apparent, and there is evidence of critical engagement with the subject matter. Expectations are met, and some are surpassed. The language and format of the work are very well-structured and error free.

B+ (good): Expectations of the assignment have been met. Understandings and insights are apparent, and there is some evidence of critical engagement. The language and format of the work are well structured but may contain a few errors.

B (acceptable): Basic expectations of the assignment have been mostly met. Understandings, insights, and evidence of critical engagement are somewhat apparent. The organization and structure of the work lack consistency and the work contains more than a few language errors.

B- (adequate): Some expectations of the assignment have been met. Work lacks organizational structure, logical coherence and clarity with frequent language errors.

C+ (problematic): Expectations of the assignment have been inconsistently addressed. Supporting ideas/content of work are vague. Work is disorganized and formatting is awkward. Numerous errors in language are present causing confusion at times.

C (very problematic): Expectations of the assignment have been poorly met. Misunderstandings are evident throughout. Work exhibits confusion and language contains numerous errors.

D (marginal): Expectations of the assignment have not been met. Serious misinterpretations are represented in content. Structure and organization are poor. Language errors are present throughout.

F (unacceptable): Expectations of the assignment have not been met. Work exhibits a profound lack of understanding. Structure and organization are absent. Numerous errors in language are present and interfere with comprehension throughout.

MCGILL POLICY STATEMENTS

LANGUAGE OF ASSESSMENT/SUBMISSION:

"In accord with McGill University's Charter of Students' Rights, students in this course have the right to submit in English or in French any written work that is to be graded. This does not apply to courses in which acquiring proficiency in a language is one of the objectives. (*Note: In courses in which acquiring proficiency in a language is one of the objectives, the assessments shall be in the language of the course.)*" (Approved by Senate on 21 January 2009)

« Conformément à la Charte des droits de l'étudiant de l'Université McGill, chaque étudiant a le droit de soumettre en français ou en anglais tout travail écrit devant être noté (sauf dans le cas des cours dont l'un des objets est la maîtrise d'une langue). »

DISE Addendum:

According to DISE policy, given our mandate to develop Professional Competency #2 (To communicate clearly in the language of instruction, both orally and in writing, using correct grammar, in various contexts related to teaching.) – all B.Ed. and MATL courses can fall under exception above.
"Given the development and assessment of Professional Competency #2, all assignments for this course must be completed and submitted in English (or French in the case of B.Ed. K/Elem PIF courses)."

ACADEMIC INTEGRITY:

"McGill University values academic integrity. Therefore, all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures" (see www.mcgill.ca/students/srr/honest/ for more information). (Approved by Senate on 29 January 2003)

« L'université McGill attache une haute importance à l'honnêteté académique. Il incombe par conséquent à tous les étudiants de comprendre ce que l'on entend par tricherie, plagiat et autres infractions académiques, ainsi que les conséquences que peuvent avoir de telles actions, selon le Code de conduite de l'étudiant et des procédures disciplinaires (pour de plus amples renseignements, veuillez consulter le site www.mcgill.ca/students/srr/honest/).»

DEPARTMENT OF INTEGRATED STUDIES IN EDUCATION POLICY STATEMENTS

The ***Principles of Practice, Behaviour and Ethical Conduct for Teacher Candidates*** (formerly Code of Conduct for Student Teachers) are in place to emphasize the importance of professionalism in teaching. These '***Principles'*** extend to all aspects of your teacher education program including coursework and field placements. Education is premised on a fundamental moral commitment to advance and construct knowledge and to ensure human understanding and respect for individual and

collective well-being and integrity. The moral imperative of respect translates into the following guiding principles that assume a student-centred perspective reflected in the Québec Education Program as well as Québec Professional Teaching Competencies.

A. Act with Integrity
B. Communicate with integrity
C. Use social media and technology responsibly
D. Demonstrate respect for equity and diversity
E. Demonstrate respect for human dignity
F. Demonstrate respect for confidentiality and privacy
G. Demonstrate respect for the teaching professional
H. Demonstrate Respect for Existing Ethical Codes and Professional Standards

SAFE SPACE:

We are committed to nurturing a space where students, teaching assistants, lecturers, and professors can all engage in the exchange of ideas and dialogue, without fear of being made to feel unwelcome or unsafe on account of biological sex, sexual orientation, gender identity o expression, race/ethnicity, religion, linguistic and cultural background, age, physical or mental ability, or any other aspect integral to one's personhood. We therefore recognize our responsibility, both individual and collective, to strive to establish and maintain an environment wherein all interactions are based on empathy and mutual respect for the person, acknowledging differences of perspectives, free from judgment, censure, and/or stigma.

CLASSROOM ETIQUETTE:

In keeping with the professional culture of teaching and learning, the Faculty of Education community believes that our teaching and learning spaces should model such professional environments. As a community, we are committed to creating authentic opportunities where understanding of teaching and learning is co-constructed between instructors and students. In order for us to create these learning environments, we are expected to demonstrate awareness of, respect for and commitment to the behaviours and actions of professionals. As members of the Faculty of Education community, we are expected to be accountable to ourselves and others and to be engaged, collegial and accessible. By doing so, we are more fully able to share together in the types of critical dialogue, creative thinking and reflective practice expected of professionals.

ADDITIONAL STATEMENTS

- If you have difficulty affording food or if you lack a safe and stable place to live, and these circumstances may affect your performance in this course, I encourage you to contact the Dean of Students, who can connect you with **support services**. Many students may face mental health challenges that can impact not only their academic success but also their ability to thrive in our campus community. Please reach out for support when you need it; wellness resources are available on campus, off campus, and online. If you feel comfortable doing so, please let me know as well so we can discuss how I can best support your learning.

- As the instructor of this course, I endeavor to provide **an inclusive learning environment**. However, if you experience barriers to learning in this course, do not hesitate to discuss them with me and/or Student Accessibility and Achievement.

- Please indicate on the start-of-course survey or via email if you would like me to refer to you by a different name than the name indicated in your student record or to inform me of your preferred pronouns.

- EMAIL POLICY: E-mail is one of the official means of communication between McGill University and its students. As with all official University communications, it is the student's responsibility to ensure that time-critical e-mail is assessed, read, and acted upon in a timely fashion. If a student chooses to forward University e-mail to another e-mail mailbox, it is that student's responsibility to ensure that the alternate account is viable. Please note that to protect the privacy of students, the University will only reply to students on their McGill e-mail account.

- Parts of this class will be recorded. By participating in classes that are recorded, you agree to the recording, and you understand that your image, voice, and name may be disclosed to classmates. You also understand that recordings will be made available to students registered in the course. Please consult me if you have concerns about privacy and we can discuss possible measures that can be taken.

- End-of-course evaluations are one of the ways that McGill works towards maintaining and improving the quality of courses and the student's learning experiences. You will be notified by e-mail when the evaluations are available. Please note that a minimum number of responses must be received for results to be available to students.

- Accommodation of Religious Holy Days. Students will not be penalized if they cannot be evaluated on their religious holy days where such activities conflict with their religious observances.

COURSE READINGS and RESOURCES

Please note that additional optional readings may be added to meet students' interests needs as the course develops.

Please refer to myCourses for document PDFs and/or links.

Reading Response	Required readings	Supplementary readings and resources
1 Science practices	Hanuscin, D. L., & Park Rogers, M. A. (2008). **Learning to observe and infer.** *Science and Children*, *45*(6), 56–57.	Bybee, R. (2015). **Ch. 1 ENGAGE.** *The BSCS 5E Instructional Model: Creating Teachable Moments*. National Science Teachers Association. (E-Book available at McGill Library).
2 Scientific process	Campbell, T., Schwarz, C., & Windschitl, M. (2016). **What we call misconceptions may be necessary stepping-stones toward making sense of the world**. *Science and Children*, 53(07). https://doi.org/10.2505/4/sc16_053_07_28	Ambitious Science Teaching**. Tools for Ambitious Science Teaching.** University of Washington College of Education.
3 Indigenous science	Williams, W. L., & Snively, G. (2016). Chapter 3 – **"Coming to Know"**: A Framework for Indigenous Science Education. In *Knowing Home: Braiding Indigenous Science with Western Science, Book 1.* University of Victoria.	**Learning Engagement 1B: Our connections to the seasons.** *Storyline for field-based science education*. Learning in Places Collaborative. **Learning activities: Food.** *Indigenous STEAM Collaborative.*
4 Science identities	Faller, E. (2018). **When you walk into this room, you're scientists!** *Science Scope*, *41*(09), 6–9. *https://doi.org/10.2505/4/ss18_041_09_6* Easy steps to a gender inclusive classroom. (2017). *Gender Spectrum.* San Leandro, CA.	Rizga, K. (2020, September 11). Children Are Born Scientists. What If School Encouraged That? *The Atlantic.* *Scientist Spotlight Initiative.* (2003). San Francisco State University. Gender Spectrum. (2016). *Principles for gender-inclusive puberty and health education.*
5 Scientific inquiry	Banchi, H., & Bell, R. (2008). **The many levels of inquiry.** *Science and Children*, *46*(2), 26–29.	*TeachingWorks.* **High-leverage practices.** University of Michigan School of Education.

ELEMENTARY SCHOOL SCIENCE 1

EDEE 270 Fall 2023

We recognize that this course is held on unceded Indigenous lands on the island of Tiohtià:ke, a gathering place for many First Nations.

This course focuses on:

- the development of science knowledge and understanding,

and

- the instructional practices for teaching science

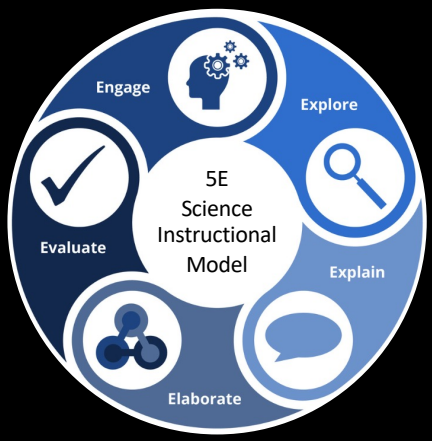
through the lens of sustainability.

Welcome!

Hi, I'm your instructor, Emily.
I've loved learning science alongside my students of all ages in and out of schools for over 20 years. I am excited to continue inquiring and exploring natural phenomena with you this year!

PEDAGOGICAL METHODS

These inquiry and practiced-based pedagogies will help us consider implications for equity and inclusion in science education.
These methods also allow us to incorporate sustainability and decolonial perspectives in teaching science to diverse learners.



Weekly Schedule

Nature of Science & Teaching	EXPLAIN	Science in Quebec	Critical Friends Groups	Science Identities	Science Teaching Reflection
ENGAGE	EXPLORE	Scientific Models	Lesson Rehearsals	Science in Community	Lesson Enactment

LEARNING OUTCOMES

HEAD (Cognitive)	HANDS (Psychomotor)	HEART (Affective)
Develop critical understanding of scientific content and process in order to situate science in broader global and real-world sustainability contexts.	Plan and implement lessons that connect science with real-world sustainability issues.	Reflect on science identities to examine how personal experiences and perspectives inform science teaching and learning.
Review and evaluate experiential and learner-relevant science pedagogies through the lens of sustainability.	Embody high-quality science teaching practices informed by diverse scientific thinkers.	Feel prepared to engage with real-world, socio-scientific sustainability issues that elementary students care about.
Explore how elementary science connects with other ways of knowing and examine how these connections inform sustainability pedagogy and content.	Collaborate with students and teachers in science learning communities.	Value and support actions required to address the historical and persistent challenges to equity, diversity and inclusion in science.

Science Teaching Practice

Through a partnership with an English public school, we have a new, exciting opportunity to enact science lessons with students in Grades 1-6 at Sinclair Laird Elementary School in the in the Park-Ex neighbourhood of Montreal. This promises to be a fun, enriching, hands-on experience for teachers and students alike.

ASSESSMENT

Quebec Education Programme
Science & Technology Competencies

- *To explore the world of science and technology.*
- To propose explanations for or solutions to scientific or technological problems.
- To make the most of scientific and technological tools, objects and procedures.
- To communicate in the languages used in science and technology.