FOOTPRINTS FOR LEARNING CHARTER ACADEMY
Global Perspectives | Entrepreneurial Spirit | Academic Excellence

DOCUMENT 5.0: K–12 SCIENCE PROGRAMMING
Authority: Footprints for Learning Society
School: Footprints for Learning Charter Academy (FLCA)
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OVERVIEW & PHILOSOPHY
Science is a dynamic, collaborative, and creative human endeavor used to understand the natural world. At Footprints for Learning Charter Academy (FLCA), our K–12 Science program empowers students to be curious, critical thinkers who ask questions, investigate phenomena, and apply their understanding to solve authentic, real-world problems.

Our programming strictly aligns with the Alberta Education Science Curriculum and deeply integrates Alberta's Core Competencies. By exploring the physical, biological, and earth sciences, students develop the scientific literacy required to make informed decisions, pursue future STEM careers, and launch innovative entrepreneurial ventures.

CORE PILLARS & INSTRUCTIONAL RESOURCES
1. Primary Resources: Edwin & Teacher Collaborations
FLCA's science programming does not rely on a single, static textbook. Instead, our key reference materials are sourced through **Edwin** (a dynamic, digital learning ecosystem) and **Alberta Teacher Implementation Collaborations**. This collaborative approach ensures that our curricula remain current, responsive to the latest scientific advancements, and aligned with provincial pilot and implementation rollouts.

2. Integration of Indigenous Peoples' Knowledge (FNMI)
Recognizing that science is shaped by cultural perspectives, FLCA explicitly honors and integrates Indigenous Ways of Knowing. Students explore the deep connections between the environment and the historical, ecological, and astronomical knowledge of First Nations, Métis, and Inuit peoples. This includes understanding sustainable land practices, local ecosystems, and holistic approaches to environmental stewardship.

3. Alberta Core Competencies Alignment
Our science instruction is purposefully designed to build Alberta's Core Competencies:

- **Critical Thinking & Problem Solving:** Formulating hypotheses and designing experiments.
- **Managing Information:** Gathering, evaluating, and synthesizing empirical data.
- **Communication & Collaboration:** Working in laboratory teams and presenting scientific findings.
- **Creativity & Innovation (Entrepreneurship):** Proposing technological or ecological solutions to modern challenges and pitching them as viable business or community initiatives.

4. Universal Design for Learning (UDL)
All science classrooms at FLCA utilize a UDL framework. Teachers provide multiple means of representation (e.g., hands-on labs, Edwin digital simulations, outdoor exploration), action and expression (e.g., building physical models, writing lab reports, recording video explanations), and engagement to ensure science is accessible to all learners.

ELEMENTARY PROGRAMMING (K–6)
Focus: *Exploration, Inquiry, and Foundational Knowledge*

In the elementary years, science is driven by wonder. Students engage in hands-on exploration of their immediate environment, focusing on foundational concepts in earth systems, living things, energy, and matter.

- **Key Themes:** Seasons and weather, life cycles of plants and animals, forces and motion, basic structures, and environmental awareness.
- **Instructional Approach:** Heavily reliant on sensory experiences, outdoor learning spaces (like the Foxes Run), and maker-space challenges. Edwin provides interactive digital tools to supplement physical experimentation.
- **Assessment:** Primarily formative, focusing on participation, science journals, and portfolio projects that demonstrate observation and basic scientific reasoning.

JUNIOR HIGH PROGRAMMING (7–9)
Focus: *The Scientific Method, Data Analysis, and Systems Thinking*

Junior high students transition from exploratory science to structured scientific inquiry. They learn to control variables, analyze quantitative data, and understand complex biological, chemical, and physical systems.

- **Key Themes:** Ecosystems, chemical properties, thermal energy, cellular biology, and space exploration.
- **Entrepreneurial Infusion:** Students are challenged to use their scientific knowledge to solve community problems. For example, applying their knowledge of botany and ecosystems to design a sustainable agricultural business model.

- **Assessment Weighting (Grades 7–9):**

    - **Lab Reports & Digital Portfolios (Edwin):** 40%
    - **Unit Assignments & Projects:** 30%
    - **Unit Tests (Formative/Summative):** 20%
    - **Final Exam (or Grade 9 PAT prep):** 10%

SENIOR HIGH PROGRAMMING (10–12)
Focus: *Specialized Disciplines, Theoretical Abstraction, and Diploma Preparation*

Senior High Science at FLCA prepares students for post-secondary education and advanced STEM careers. The curriculum demands high-level mathematical integration (e.g., calculating kinematic equations in Physics, or stoichiometric balancing in Chemistry) and rigorous analytical reasoning. Standard AB ED approved resources from Nelson, McGraw-Hill, and Pearson are used.

- **Science 10 (Foundational):** A prerequisite course covering introductory chemistry, physics, biology, and global energy systems.
- **The "-1" Academic Pathways (Biology 20/30, Chemistry 20/30, Physics 20/30):** Specialized, university-preparatory courses. Students engage in complex laboratory work, digital simulations via Edwin, and comprehensive theoretical analysis.
- **The "-2 / -3" Pathways (Science 20/30, Science 14/24):** Applied science tracks focusing on scientific literacy, environmental issues, and practical applications in the trades and everyday life.
- **Assessment Weighting (Diploma 30-Level Courses):**

    - **Labs, Portfolios, and Entrepreneurial Pitch Projects:** 25%
    - **Unit Exams:** 45%
    - **Alberta Provincial Diploma Examination:** 30% (Provincially Mandated)

APPENDIX: UDL & ENTREPRENEURIAL SCIENCE - Grade 9 Example

Topic: Environmental Chemistry & Water Quality
Core Competency: Problem Solving & Innovation

- **Representation:** Students learn about chemical indicators (pH, dissolved oxygen, toxins) through a combination of traditional Edwin reading modules, interactive digital water-quality simulations, and a hands-on physical lab testing local water samples.
- **Expression (Entrepreneurial Pitch):** Instead of a standard written unit test, students form "Environmental Consulting Firms." They must analyze a contaminated water data set, identify the chemical issue, and design a sustainable, cost-effective filtration prototype.
- **Engagement:** The task culminates in a "Shark Tank" style pitch where students present their scientific findings and filtration product to a panel, defending both the underlying chemistry and the economic viability of their solution.