FOOTPRINTS FOR LEARNING CHARTER ACADEMY (FLCA)
Holistic | Authentic | Purpose-Driven | Entrepreneurial | Global

DOCUMENT 4.0: K–12 MATHEMATICS PROGRAMMING
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OVERVIEW & PHILOSOPHY
Mathematics is a universal language relying on a shared understanding of symbols and procedures to communicate ideas efficiently and solve real-life problems. Engaging with mathematics allows FLCA students to develop logical thinking skills, contributing to effective decision-making and problem-solving. Through flexible and collaborative learning, students appreciate the patterns and relationships that describe our world and its future possibilities.

Numeracy & Mathematical Development:

- **Numeracy** is a foundational building block developed across all subjects. It focuses on counting, calculating, measuring, organizing data, and interpreting graphs.
- **Concrete to Abstract:** Mathematics education at FLCA is an ongoing process of connecting concrete experiences to abstract concepts.
- **Spatial Reasoning:** Mathematics provides the tools to interpret spatial information, progressing from direct comparison to standardized measurement and geometric theorems.
- **Problem Solving:** Students apply foundational knowledge to visualize, reason, and justify solutions, supporting vital life skills like financial literacy and entrepreneurial ventures.

Note: Learning outcomes in the elementary AND some middle school curriculum emphasize foundational mastery, often intended to be achieved without the support of calculators in early grades.

PROGRAM RESOURCES & METHODOLOGY
FLCA utilizes a blended, comprehensive approach to mathematics to ensure mastery, confidence, and deep understanding across all grade levels.

1. Math-U-See (Primary Focus for K–6)
Math-U-See is a mastery-based program that uses manipulatives to build a concrete understanding of mathematical concepts before moving to abstract equations.

- **Process:** Teachers introduce concepts using block manipulatives and instructional videos. Students build problems and work through sections (A-F) at their own pace.
- **Mastery:** Students must demonstrate mastery on lesson tests before advancing.
- **Differentiation:** Students who finish early move to independent Math Centres. Students requiring more time receive targeted parental and teacher support.

2. JUMP Math (Integration for K–9)
JUMP Math relies on guided discovery, scaffolding, and continuous assessment to ensure no student is left behind. It breaks down complex concepts into micro-steps.

- **Process:** JUMP Math workbooks and teacher resources are utilized alongside Math-U-See to cover gaps, reinforce Alberta Curriculum outcomes, and provide alternative explanations for algebraic and geometric concepts.
- **Application:** Heavily utilized in Grades 4–9 to transition students from concrete manipulatives to abstract algebraic thinking and standardized problem-solving.

3. Standard High School References (10–12)
As students transition to Senior High, programming aligns with standard Alberta Education pathways (-1, -2, -3) utilizing approved resources (e.g., Pearson, Nelson, Math Makes Sense).

- **Process:** Instruction integrates direct teaching, digital graphing analysis (e.g., Desmos), and rigorous summative assessments to prepare students for Diploma Examinations and post-secondary requirements.

ELEMENTARY PROGRAMMING (K–6)
Curriculum Focus: Number Sense, Geometry, Measurement, Patterns, Time, Algebra (Gr 3+), Coordinate Geometry (Gr 5+), and Statistics.

Teaching Process & Materials:

- **Math-U-See & JUMP Math Workbooks:** Students progress through workbooks, self-correcting under teacher supervision.
- **Math Centres & Portfolios:** When workbook tasks are complete, students engage in differentiated Math Centres that provide authentic contexts for numeracy skills.
- **Cross-Curricular Infusion:** Math Portfolios actively infuse Entrepreneurship and FNMI (First Nations, Métis, and Inuit) contexts.

K-6 Assessment Weighting:

Assessment Category	Weighting	Details
Workbooks / Practice	30%	Math-U-See / JUMP Math completion and engagement.
Lesson Tests	30%	Mastery checks before progressing to the next module.
Portfolio Tasks	20%	Centre activities, UDL applications, and entrepreneurial projects.
Summative Assessments	20%	Unit Exams (Formative/Summative mix).

JUNIOR HIGH PROGRAMMING (7–9)
Curriculum Focus: Number Sense, Algebraic Expressions, Measurement (Direct/Indirect), 2D/3D Shape Relationships, Motion/Position, Data Analysis, and Probability.

Teaching Process & Materials:

- **Student Activity Booklets:** Derived from JUMP Math and *Math Makes Sense*. These are treated as textbooks; students complete work in graph paper binders.
- **Google Classroom:** Activity books, unit guides, and supplementary videos are posted digitally for parent and student access.
- **Unit Tests:** Supervised, in-class assignments and exams.
- **Math 9-4 (Knowledge & Employability):** Focuses on everyday applications, foundational arithmetic, and project-based portfolios rather than standardized final exams.

7-9 Assessment Weighting:

Assessment Category	Weighting (Standard)	Weighting (Math 9-4)
Workbook / Learning Booklets	40%	60%
Portfolio Assignments	20%	40% (Project-based)
Unit Tests	20%	N/A
Mid-Term Exam	10%	N/A
Final Exam	10%	N/A

SENIOR HIGH PROGRAMMING (10–12)
Curriculum Pathways:

- **10C (Common):** The foundational course leading to the -1 or -2 pathways, focusing on spatial sense, algebraic reasoning, and functions.
- **-1 Pathway (20-1, 30-1):** Pre-Calculus track designed for students entering post-secondary programs requiring advanced math (e.g., engineering, sciences).
- **-2 Pathway (20-2, 30-2):** Principles of Mathematics track designed for students entering post-secondary programs not requiring calculus (e.g., arts, nursing, business).

- **-3 Pathway (10-3, 20-3, 30-3):** Workplace and Apprenticeship track focusing on financial literacy, spatial reasoning, and trades-based measurement.

Teaching Process & Materials:

- **Standard Textbooks:** Utilization of approved AB ED texts (e.g., Pearson Foundations and Pre-Calculus, Nelson Mathematics).
- **Technology:** Mandatory integration of graphing calculators (TI-84+) and digital modeling software to analyze complex functions and statistical data.

- **Entrepreneurial Integration:** Real-world financial modeling, business optimization, and statistical market analysis are integrated into course portfolios.

10-12 Assessment Weighting:

Assessment Category	Weighting (Non-Diploma)	Weighting (Diploma 30-1 / 30-2)
Assignments & Portfolios	20%	15%
Unit Exams & Quizzes	50%	35%
Mid-Term Exam	10%	10%
Final Exam / Diploma	20%	40% (Provincially Mandated)

Note: Across all grade levels (K-12), FLCA requires the application of the Universal Design for Learning (UDL) approach alongside Alberta Education Core Competencies to build student skill sets with continuous feedback for growth.

APPENDIX: UDL Lesson Plan – Grade 9 PAT Preparation
Lesson Overview & Objectives
This lesson focuses on reviewing multi-step algebraic linear equations, a critical and heavily weighted component of the Grade 9 Mathematics Provincial Achievement Test (PAT). By applying the Universal Design for Learning (UDL) framework, the lesson removes barriers to learning, ensuring all students can access the material, engage meaningfully, and demonstrate their mathematical reasoning prior to the standardized exam.

UDL Implementation Strategies
- **Representation (Visual & Tactile):** Introduce algebraic concepts using a blended approach. Project digital manipulative simulations (like Desmos) on the smartboard while providing physical algebra tiles to students who benefit from concrete, hands-on learning.
- **Representation (Language):** Pre-teach and display key algebraic vocabulary—such as "coefficient," "variable," and "constant"—on a visual word wall with accompanying graphic symbols.

- **Expression (Flexible Demonstration):** Allow students to demonstrate their mastery of the review material through multiple avenues. Options include completing a standard PAT-style practice booklet, recording a short screencast explaining their solving process, or designing a step-by-step visual infographic.
- **Expression (Scaffolding):** Provide partially completed equation templates or guided JUMP Math worksheets for students who require structural support before moving to independent problem-solving.
- **Engagement (Authentic Context):** Frame the algebraic equations around an entrepreneurial scenario. For example, have students calculate the break-even point for a student-led school store.
- **Engagement (Collaboration):** Utilize a structured "Think-Pair-Share" model where students verbally decode complex PAT word problems with a peer before attempting to calculate the solution independently.