Area of Learning: Mathematics	Foundations of Mathematics 12		
Big Ideas		Elaborations	
• Probabilistic thinking helps us make educated decisions in complex situations.			
• Understanding the characteristics of a variety of functions helps in modelling data.			
• Logical reasoning helps us pose, organize, and defend arguments.			
• Using spatial relationships, we can create, measure, and describe objects in geometry.			
• Stories can be told using mathematical evidence and reasoning.		• in the context of regression analysis and odds and probability • students can demonstrate their learning through projects or research • mathematics can be used in the analysis of contextualized situations.	

Curricular Competencies	Elaborations	Content	Elaborations

Students are expected to do the following:
Reasoning and analyzing
• Use **reasoning and logic** to analyze and apply mathematical ideas
• **Estimate** reasonably
• Demonstrate **fluent and flexible thinking** of number
• Use tools or technology to analyze relationships and test conjectures
• **Model** mathematics in contextualized experiences
 	
Understanding and solving
• Develop, demonstrate, and apply mathematical understanding through play, inquiry, and problem solving
	• **reasoning and logic**:
	  o inductive and deductive reasoning
	  o predicting, generalizing, drawing conclusions through experiences including puzzles, games, and coding
	• **Estimate:**
	  o being able to defend the reasonableness of an estimate across mathematical contexts
	• **fluent and flexible thinking:**
	  o includes using known facts and benchmarks; partitioning; applying whole number strategies to rational numbers and
		Students are expected to know the following:
		• transformations with iterations to create **fractals**
		• graphical **representations** of polynomial, logarithmic, exponential, and sinusoidal functions
		• **regressions**
		• regression **analysis**
		• set theory and conditional statements
		• **combinatorics**
		• **odds, probability,** and expected value
		• financial literacy: investments and loans
			• **fractals:**
			  o understanding fractals as an iterated construction, constructing and analyzing models of fractals, such as Cantor's dust, Serpinski's triangle, Koch's snowflact connecting fractals to nature
			• **representations:**
			  o using characteristics of a graph to identify these functions
			• **regressions:**
			  o polynomial, exponential, sinusoidal, logarithmic
			• **analysis:**
			  o apply the appropriate regression based on the characteristics of a data set

• **Visualize** to explore and illustrate mathematical concepts and relationships
• Apply **flexible strategies** to solve problems in both abstract and contextualized situations
• Engage in problem-solving **experiences** that are connected to place, story, cultural practices, and perspectives relevant to local First Peoples communities, the local community, and other cultures
 	
Communicating and representing
• Communicate mathematical thinking in **many ways**
• Use mathematical vocabulary and language to contribute to mathematical **discussions**
• **Represent** mathematical ideas in a variety of ways
• Explain and justify mathematical ideas
 	
Connecting and reflecting
• **Reflect** on mathematical thinking
• Use mathematics to support personal choices
• Connect mathematical concepts to each other and to **other areas and personal interests**
• **Incorporate** First Peoples worldviews and perspectives to **make connections** to mathematical concepts
	algebraic expressions
	• **Model:**
	  o using concrete materials and dynamic interactive technology
	  o representing a situation graphically and/or symbolically
	• **Visualize:**
	  o includes dynamic visualizations such as graphical relationships, simulations
	• **flexible strategies:**
	  o from a repertoire of strategies, choosing an appropriate strategy to solve problems (e.g., guess and check, model, solve a simpler problem, use a chart, use diagrams, role-play)
	• **experiences:**
	  o includes context, strategies and approaches, language across cultures
	• **many ways:**
	  o including oral, written, visual, use of technology
	• **discussions:**
	  o developing a mathematical community in the classroom through discourse — partner talks, small-group discussions, teacher-student
			of a graph
			• **combinatorics:**
			  o permutations, combinations, pathways, binomial expansion
			• **odds, probability:**
			  o mutually exclusive, non–mutually exclusive, conditional probability, binomial probability

conferences

- **Represent:**
  - o concretely, pictorially, symbolically, including using models, tables, graphs, words, numbers, symbols
- **Reflect:**
  - o sharing the mathematical thinking of self and others, including evaluating strategies and solutions, extending, posing new problems and questions
- **other areas and personal interests:**
  - o to develop a sense of how mathematics helps us understand ourselves and the world around us (e.g., daily activities, local and traditional practices, the environment, popular media and news events, social justice, cross-curricular integration)
- **Incorporate:**
  - o Collaborate with local First Peoples Elders and knowledge keepers.
- **make connections:**
  - o Bishop's cultural practices: counting, measuring, locating, designing, playing, explaining (http://www.csus.edu/indiv/o/

	oreyd/ACP.htm_files/abishop.htm) o www.aboriginaleducation.ca o *Teaching Mathematics in a First Nations Context,* FNESC (http://www.fnesc.ca/resources/math-first-peoples/)		