

Area of Learning: Mathematics		Foundations of Mathematics 11	
Big Ideas		Elaborations	
<ul style="list-style-type: none"> <li>• <b>Proportional reasoning</b> enables us to make sense of multiplicative relationships and is frequently used when analyzing contextual situations.</li> </ul>		<ul style="list-style-type: none"> <li>• <b>Proportional comparisons:</b> <ul style="list-style-type: none"> <li>○ Geometry and Measurement: Proportional reasoning is used to make sense of multiplicative relationships.</li> </ul> </li> </ul>	
<ul style="list-style-type: none"> <li>• Contextual situations can be optimized through a mathematical analysis.</li> </ul>			
<ul style="list-style-type: none"> <li>• Logical reasoning helps us discover and describe mathematical truths and counter-examples.</li> </ul>			
<ul style="list-style-type: none"> <li>• A statistical analysis allows us to notice trends and relationships.</li> </ul>			
<ul style="list-style-type: none"> <li>• <b>Stories</b> can be told using mathematical evidence and reasoning.</li> </ul>		<ul style="list-style-type: none"> <li>• <b>Stories:</b> <ul style="list-style-type: none"> <li>○ in the context of optimization problems and statistical analysis</li> <li>○ students can demonstrate their learning through projects or research</li> <li>○ mathematics can be applied to contextualized situations</li> </ul> </li> </ul>	
Curricular Competencies	Elaborations	Content	Elaborations
<p><i>Students are expected to do the following:</i></p> <p>Reasoning, analyzing, and modelling</p> <ul style="list-style-type: none"> <li>• Use <b>reasoning and logic</b> to analyze and apply mathematical ideas</li> <li>• <b>Estimate</b> reasonably</li> <li>• Demonstrate <b>fluent and flexible thinking</b> of number</li> <li>• Use tools or technology to analyze relationships and test conjectures</li> <li>• <b>Model</b> mathematics in contextualized experiences</li> </ul> <p>Understanding and solving</p> <ul style="list-style-type: none"> <li>• Develop, demonstrate, and apply mathematical understanding</li> </ul>	<ul style="list-style-type: none"> <li>• <b>reasoning and logic:</b> <ul style="list-style-type: none"> <li>○ inductive and deductive reasoning</li> <li>○ predicting, generalizing, drawing conclusions through experiences including puzzles, games, and coding</li> </ul> </li> <li>• <b>Estimate:</b> <ul style="list-style-type: none"> <li>○ being able to defend the reasonableness of an estimate across mathematical contexts</li> </ul> </li> <li>• <b>fluent and flexible thinking:</b> <ul style="list-style-type: none"> <li>○ includes using known facts and benchmarks; partitioning; applying</li> </ul> </li> </ul>	<p><i>Students are expected to know the following:</i></p> <ul style="list-style-type: none"> <li>• forms of mathematical <b>reasoning</b></li> <li>• <b>angle relationships</b></li> <li>• graphical <b>analysis</b> <ul style="list-style-type: none"> <li>○ <b>quadratic functions</b></li> <li>○ <b>linear inequalities</b></li> </ul> </li> <li>• graphical <b>solutions</b> to systems of equations</li> <li>• <b>applications</b> of statistics in the real world</li> <li>• <b>rates</b></li> <li>• <b>financial literacy:</b> investments and loans</li> </ul>	<ul style="list-style-type: none"> <li>• <b>reasoning:</b> <ul style="list-style-type: none"> <li>○ logic, conjecturing, inductive and deductive thinking, proofs, game/puzzle analysis</li> </ul> </li> <li>• <b>angle relationships:</b> <ul style="list-style-type: none"> <li>○ properties, proofs, parallel lines, triangles, constructions</li> </ul> </li> <li>• <b>analysis:</b> <ul style="list-style-type: none"> <li>○ solving optimization problems</li> </ul> </li> <li>• <b>quadratic functions:</b> <ul style="list-style-type: none"> <li>○ characteristics of graphs, including end behaviour, maximum/minimum, vertex, symmetry,</li> </ul> </li> </ul>

<p>through play, inquiry, and problem solving</p> <ul style="list-style-type: none"> <li>• <b>Visualize</b> to explore and illustrate mathematical concepts and relationships</li> <li>• Apply <b>flexible strategies</b> to solve problems in both abstract and contextualized situations</li> <li>• Engage in problem-solving <b>experiences</b> that are connected to place, story, cultural practices, and perspectives relevant to local First Peoples communities, the local community, and other cultures</li> </ul> <p>Communicating and representing</p> <ul style="list-style-type: none"> <li>• Communicate mathematical thinking in <b>many ways</b></li> <li>• Use mathematical vocabulary and language to contribute to mathematical <b>discussions</b></li> <li>• <b>Represent</b> mathematical ideas in a variety of ways</li> <li>• Explain and justify mathematical ideas</li> </ul> <p>Connecting and reflecting</p> <ul style="list-style-type: none"> <li>• <b>Reflect</b> on mathematical thinking</li> <li>• Use mathematics to support personal choices</li> <li>• Connect mathematical concepts to each other and to <b>other areas and personal interests</b></li> <li>• <b>Incorporate</b> First Peoples worldviews and perspectives to <b>make connections</b> to</li> </ul>	<p>whole number strategies to rational numbers and algebraic expressions</p> <ul style="list-style-type: none"> <li>• <b>Model:</b> <ul style="list-style-type: none"> <li>○ using concrete materials and dynamic interactive technology</li> <li>○ representing a situation graphically and/or symbolically</li> </ul> </li> <li>• <b>Visualize:</b> <ul style="list-style-type: none"> <li>○ includes dynamic visualizations such as graphical relationships, simulations</li> </ul> </li> <li>• <b>flexible strategies:</b> <ul style="list-style-type: none"> <li>○ 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)</li> </ul> </li> <li>• <b>experiences:</b> <ul style="list-style-type: none"> <li>○ includes context, strategies and approaches, language across cultures</li> </ul> </li> <li>• <b>many ways:</b> <ul style="list-style-type: none"> <li>○ including oral, written, visual, use of technology</li> </ul> </li> <li>• <b>discussions:</b> <ul style="list-style-type: none"> <li>○ developing a mathematical community in the classroom through discourse — partner talks,</li> </ul> </li> </ul>		<p>intercepts</p> <ul style="list-style-type: none"> <li>• <b>linear inequalities:</b> <ul style="list-style-type: none"> <li>○ using feasible region to optimize objective function</li> </ul> </li> <li>• <b>solutions:</b> <ul style="list-style-type: none"> <li>○ solving and interpreting</li> <li>○ including linear with linear, linear with quadratic, and quadratic with quadratic</li> </ul> </li> <li>• <b>applications:</b> <ul style="list-style-type: none"> <li>○ reading about and interpreting surveys,</li> <li>○ measures of central tendency, standard deviation, confidence intervals, z-scores, distributions</li> </ul> </li> <li>• <b>rates:</b> <ul style="list-style-type: none"> <li>○ comparing and interpreting rates, scale diagrams/models of 2D shapes and 3D objects</li> </ul> </li> <li>• <b>financial literacy:</b> <ul style="list-style-type: none"> <li>○ introduction to investments, loans, credit cards, mortgages</li> </ul> </li> </ul>
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<p>mathematical concepts</p>	<p>small-group discussions, teacher-student conferences</p> <ul style="list-style-type: none"> <li>• <b>Represent:</b> <ul style="list-style-type: none"> <li>○ concretely, pictorially, symbolically, including using models, tables, graphs, words, numbers, symbols</li> </ul> </li> <li>• <b>Reflect:</b> <ul style="list-style-type: none"> <li>○ sharing the mathematical thinking of self and others, including evaluating strategies and solutions, extending, posing new problems and questions</li> </ul> </li> <li>• <b>other areas and personal interests:</b> <ul style="list-style-type: none"> <li>○ 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)</li> </ul> </li> <li>• <b>Incorporate:</b> <ul style="list-style-type: none"> <li>○ Collaborate with local First Peoples Elders and knowledge keepers.</li> </ul> </li> <li>• <b>make connections:</b> <ul style="list-style-type: none"> <li>○ Bishop's cultural practices: counting, measuring, locating,</li> </ul> </li> </ul>		
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