

Area of Learning: Statistics			
Big Ideas	Elaborations		
<ul style="list-style-type: none"> <li>Data should be gathered and organized with care in order to answer questions.</li> </ul>			
<ul style="list-style-type: none"> <li>Data can be analyzed using a variety of methods.</li> </ul>			
<ul style="list-style-type: none"> <li>Statistical knowledge is used when working with data to find reliable results that are trustworthy.</li> </ul>			
<ul style="list-style-type: none"> <li>Conclusions can be represented graphically and numerically to communicate and inform.</li> </ul>			
Curricular Competencies	Elaborations	Content	Elaborations
<p><i>Students are expected to do the following:</i></p> <p><b>Reasoning and analyzing</b></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><b>Understanding and solving</b></p> <ul style="list-style-type: none"> <li>Develop, demonstrate, and apply <b>conceptual understanding</b> of mathematical ideas</li> <li><b>Visualize</b> to explore and illustrate mathematical concepts and</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, 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>this includes using known facts, benchmarks, partitioning, applying whole number strategies to rational numbers and algebraic expressions</li> </ul> </li> <li><b>Model:</b> <ul style="list-style-type: none"> <li>use concrete materials, dynamic interactive technology, representing a situation graphically and/or symbolically</li> <li><a href="http://www.nctm.org/Publications/Teaching-Children-Mathematics/Blog/Modeling-with-Mathematics-through-Three-Act-Tasks/">http://www.nctm.org/Publications/Teaching-Children-Mathematics/Blog/Modeling-with-Mathematics-through-Three-Act-Tasks/</a></li> </ul> </li> <li><b>conceptual understanding:</b> <ul style="list-style-type: none"> <li>developed through playing with ideas, inquiry, and problem solving</li> </ul> </li> <li><b>visualize:</b> <ul style="list-style-type: none"> <li>including dynamic visualizations such as graphical relationships, simulations</li> </ul> </li> <li><b>flexible strategies:</b></li> </ul>	<p><i>Students are expected to know the following:</i></p> <ul style="list-style-type: none"> <li><b>Graphical representations</b> for data</li> <li>Statistical analysis of data and relationships between data, including <b>standard deviation</b> and the Normal Distribution, Z-scores, confidence intervals, and <b>correlation co-efficient</b></li> <li><b>Sampling Techniques</b> and bias</li> <li>Formulating <b>hypotheses</b> from data sets</li> <li><b>Statistical techniques</b> to test the validity of hypotheses</li> <li><b>Analyze</b> and make statistical conclusions</li> <li>Mathematics is a tool when conducting research</li> </ul>	<ul style="list-style-type: none"> <li><b>Graphical representations:</b> <ul style="list-style-type: none"> <li>Data types, box &amp; whisker plots, quartiles, outliers, skewed and symmetric data, scatter plots and infographics.</li> </ul> </li> <li><b>standard deviation:</b> <ul style="list-style-type: none"> <li>Understand the meaning and the application of Standard deviation.</li> </ul> </li> <li><b>correlation co-efficient:</b> <ul style="list-style-type: none"> <li>Understand the meaning and application of the correlation co-efficient</li> </ul> </li> <li><b>Sampling Techniques:</b> <ul style="list-style-type: none"> <li>Simple Random, Stratified, Convenience</li> </ul> </li> <li><b>hypotheses:</b> <ul style="list-style-type: none"> <li>State <math>H_0</math> and <math>H_a</math> for determining null and alternative hypotheses.</li> </ul> </li> <li><b>Statistical techniques:</b> <ul style="list-style-type: none"> <li>one sample &amp; two sample tests, common</li> </ul> </li> </ul>

<p>relationships</p> <ul style="list-style-type: none"> <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, and cultural practices and perspectives relevant to local First Peoples communities, as well as other cultures</li> </ul> <p><b>Communicating and representing</b></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><b>Connecting and reflecting</b></p> <ul style="list-style-type: none"> <li>• <b>Reflect</b> upon 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</b></li> </ul>	<ul style="list-style-type: none"> <li>○ from a repertoire of strategies, choose an appropriate strategy to solve problems (e.g., guess and check, model, solve a simpler problem, use a chart, diagrams, role play)</li> </ul> <ul style="list-style-type: none"> <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>○ oral, written, pictures, 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, small group discussions, teacher-student conferences</li> </ul> </li> <li>• <b>Represent:</b> <ul style="list-style-type: none"> <li>○ concretely, pictorially, symbolically including using models, tables, graphs, words, numbers and symbols</li> </ul> </li> <li>• <b>Reflect:</b> <ul style="list-style-type: none"> <li>○ share 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, and cross-curricular integration)</li> </ul> </li> <li>• <b>Incorporate:</b> <ul style="list-style-type: none"> <li>○ Invite local First Peoples Elders and knowledge keepers to share their knowledge</li> </ul> </li> <li>• <b>make connections:</b> <ul style="list-style-type: none"> <li>○ Bishop’s cultural practices: counting, measuring, locating, designing, playing, explaining (<a href="http://www.csus.edu/indiv/o/oreyd/ACP.htm_files/abishop.htm">http://www.csus.edu/indiv/o/oreyd/ACP.htm_files/abishop.htm</a>)</li> <li>○ FNEESC Place-Based Themes and Topics: family &amp; ancestry; travel &amp; navigation; games; land, environment &amp; resource management; community profiles; artwork; nutrition; dwellings</li> <li>○ <a href="http://www.fnesc.ca/resources/math-first-peoples/">http://www.fnesc.ca/resources/math-first-peoples/</a></li> </ul> </li> </ul>		<p>test statistics (Z, t, chi squared and F), one &amp; two tail Z and t tests, ANOVA tests</p> <ul style="list-style-type: none"> <li>• <b>Analyze:</b> <ul style="list-style-type: none"> <li>○ use degrees of freedom, p-values, type I and II error, and level of significance</li> </ul> </li> </ul>
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<b>connections to mathematical concepts</b>			
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