BRITISH
COLUMBIA
Ministry of Education

BIG IDEAS

The **concept of a limit** is foundational to calculus.	Differential calculus develops the concept of **instantaneous rate of change**.	Integral calculus develops the concept of determining a product involving a **continuously changing** quantity over an interval.	Derivatives and integrals are **inversely related**.

Learning Standards

Curricular Competencies	Content
Students are expected to do the following:	*Students are expected to know the following:*
Reasoning and modelling	• **functions** and graphs
• Develop **thinking strategies** to solve puzzles and play games	• **limits:**
• Explore, **analyze**, and apply mathematical ideas using **reason**, **technology**, and **other tools**	− left and right limits
• **Estimate reasonably** and demonstrate **fluent, flexible, and strategic thinking** about number	− limits to infinity
• **Model** with mathematics in **situational contexts**	− continuity
• **Think creatively** and with **curiosity and wonder** when exploring problems	• **differentiation:**
Understanding and solving	− **rate of change**
• Develop, demonstrate, and apply conceptual understanding of mathematical ideas through play, story, **inquiry**, and problem solving	− **differentiation rules**
• **Visualize** to explore and illustrate mathematical concepts and relationships	− higher order, implicit
• Apply **flexible and strategic approaches** to **solve problems**	− **applications**
• Solve problems with **persistence and a positive disposition**	• **integration:**
• Engage in problem-solving experiences **connected** with place, story, cultural practices, and perspectives relevant to local First Peoples communities, the local community, and other cultures	− **approximations**
	− fundamental theorem of calculus
	− **methods of integration**
	− **applications**

Learning Standards (continued)

Curricular Competencies	Content
Communicating and representing • **Explain and justify** mathematical ideas and **decisions** in **many ways** • **Represent** mathematical ideas in concrete, pictorial, and symbolic forms • Use mathematical vocabulary and language to contribute to **discussions** in the classroom • Take risks when offering ideas in classroom **discourse** **Connecting and reflecting** • **Reflect** on mathematical thinking • **Connect mathematical concepts** with each other, other areas, and personal interests • Use **mistakes** as **opportunities to advance learning** • **Incorporate** First Peoples worldviews, perspectives, **knowledge**, and **practices** to make connections with computer science concepts	