**Area of Learning: MATHEMATICS — Computer Science Grade 11**

**BIG IDEAS**

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| **Decomposition** helps us solve difficult problems by managing complexity. |  | **Algorithms** are essential in solving problems computationally. |  | Programming is a tool that allows us to implement **computational thinking**. |  | **Solving problems** is a creative process. |

**Learning Standards**

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| **Curricular Competencies** | **Content** |
| *Students are expected to do the following:*Reasoning and modelling* Develop **flexible thinking** to analyze and create algorithms
* Explore, **analyze**, and apply mathematical ideas and computer science concepts using **reason**, **technology**, and **other tools**
* **Model** with mathematics in **situational contexts**
* **Think creatively** and with **curiosity and** **wonder** when exploring problems

Understanding and solving* Develop, demonstrate, and apply conceptual understanding through experimentation, **inquiry**, and problem solving
* **Visualize** to explore and illustrate computer science concepts and relationships
* Apply **flexible and strategic approaches** to **solve problems**
* Solve problems with **persistence and a positive disposition**
* 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
 | *Students are expected to know the following:** ways to represent **basic data types**
* **basic programming concepts**
* variable **scope**
* ways to construct and evaluate **logical statements**
* use of **control flow** to manipulate program execution
* **development of algorithms** to solve problems in multiple ways
* techniques for **operations** on and **searching** ofarrays and lists
* problem decomposition through **modularity**
* uses of computing for **financial analysis**
* ways to model **mathematical problems**
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**Area of Learning: MATHEMATICS — Computer Science Grade 11**

**Learning Standards (continued)**

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| **Curricular Competencies** | **Content** |
| Communicating and representing* **Explain and justify** mathematical ideas and **decisions** in **many ways**
* **Represent** computer science ideas in concrete, pictorial, symbolic, and pseudocode forms
* Use computer science and 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 and computational thinking
* **Connect mathematical and computer science 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
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