Area of Learning: MATHEMATICS — Computer Science

BIG IDEAS

Decomposition and abstraction improve our ability to understand, reduce complexity, and solve problems.

Algorithms describe the process of solving computational problems.

Programming is a tool that allows us to implement computational thinking.

Data representation allows us to understand and efficiently solve problems.

Learning Standards

Curricular Competencies

**Students are expected to do the following:**

**Reasoning and analyzing**

- Use reasoning and logic to analyze and apply mathematical ideas
- Estimate algorithmic correctness
- Demonstrate fluent and flexible thinking
- Use tools or technology to analyze relationships and test conjectures
- Model mathematics in contextualized experiences

**Understanding and solving**

- Develop, demonstrate, and apply conceptual understanding of mathematical ideas
- 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 First Peoples communities, the local community, and other cultures

**Communicating and representing**

- Communicate mathematical thinking in many ways
- Use mathematical and computer science vocabulary and language to contribute to discussions
- Represent mathematical ideas in a variety of ways
- Explain and justify mathematical and computational ideas

Content

**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 of arrays and lists
- problem decomposition through modularity
- uses of computing for financial analysis
- ways to model mathematical problems
## Curricular Competencies

### Connecting and reflecting
- **Reflect** on mathematical and computational thinking
- Use mathematics and computer science to support personal choices
- Connect mathematical and computer science concepts to each other and to **other areas and personal interests**
- **Incorporate** First Peoples worldviews and perspectives to make connections to computer science concepts

### Content