

Applied Design, Skills, and Technology 8

Robotics and Computational Thinking

Rationale

The Applied Design, Skills, and Technologies curriculum builds on students' natural curiosity, inventiveness, and desire to create and work in practical ways. It harnesses the power of learning by doing, and provides the challenging fun that inspires students to dig deeper, work with big ideas, and adapt to a changing world. It provides learning opportunities through which students can discover their interests in practical and purposeful ways.

Big Ideas

- Design can be responsive to identified needs.
- Complex tasks require the acquisition of additional skills.
- Complex tasks may require multiple tools and technologies.

Unit A: Robotics with *Lego Mindstorm*

Students are expected to know the following:

- uses of robotics in local contexts (Sumo wrestling and robot wars)
- types of sensors (colour sensors, pressure sensors)
- user and autonomous control systems
- movement and sensor based responses
- program flow (following a designated path)
- identification and applications of components (motors and CPU units)
- various platforms for robotics programming (Lego Mindstorm and Lego Commander)

Unit B: Computational Thinking with *HTML5* and *Scratch*

Students are expected to know the following:

- software programs as specific and sequential instructions with algorithms that can be reliably repeated by others
- debugging algorithms and programs by breaking problems down into a series of sub-problems
- programming languages, including visual programming (SCRATCH) in relation to text-based programming (HTML5) and programming modular components (LEGO MINDSTORM)
- keyboarding techniques (ATRT)

Self-assessment will be used help determine a student's level of mastery of key components within each unit.