

## BIG IDEAS

Social, ethical, and sustainability considerations impact design.

Complex tasks require the sequencing of skills.

Complex tasks require different technologies and tools at different stages.

## Learning Standards

Curricular Competencies	Content
<p><i>Students are expected to be able to do the following:</i></p> <p><b>Applied Design</b></p> <p><i>Understanding context</i></p> <ul style="list-style-type: none"> <li>Engage in a period of <b>research</b> and <b>empathetic observation</b> in order to understand design opportunities</li> </ul> <p><b>Defining</b></p> <ul style="list-style-type: none"> <li>Choose a design opportunity</li> <li>Identify potential users and relevant contextual factors</li> <li>Identify criteria for success, intended impact, and any <b>constraints</b></li> </ul> <p><b>Ideating</b></p> <ul style="list-style-type: none"> <li>Take creative risks in generating ideas and add to others' ideas in ways that enhance them</li> <li>Screen ideas against criteria and constraints</li> <li>Critically analyze and prioritize competing factors, including social, ethical, and sustainability considerations, to meet community needs for preferred futures</li> <li>Choose an idea to pursue, keeping other potentially viable ideas open</li> </ul> <p><b>Prototyping</b></p> <ul style="list-style-type: none"> <li>Identify and use <b>sources of inspiration</b> and information</li> <li>Choose a form for prototyping and develop a <b>plan</b> that includes key stages and resources</li> <li>Evaluate a variety of materials for effective use and potential for reuse, recycling, and biodegradability</li> <li>Prototype, making changes to tools, materials, and procedures as needed</li> <li>Record <b>iterations</b> of prototyping</li> </ul>	<p><i>Students are expected to know the following:</i></p> <ul style="list-style-type: none"> <li>opportunities for entrepreneurship</li> <li><b>characteristics</b> of entrepreneurs</li> <li>ways to add value to an existing idea or product</li> <li>differences between <b>invention</b> and <b>innovation</b></li> <li>barriers that various groups of entrepreneurs face (e.g., First Peoples, women, and new immigrants), and the factors that can contribute to their success</li> <li>life cycle of a product from invention/innovation to the marketplace</li> </ul>

**Learning Standards (continued)**

Curricular Competencies	Content
<p><i>Testing</i></p> <ul style="list-style-type: none"> <li>• Identify <b>sources of feedback</b></li> <li>• Develop an <b>appropriate test</b> of the prototype</li> <li>• Conduct the test, collect and compile data, evaluate data, and decide on changes</li> <li>• Iterate the prototype or abandon the design idea</li> </ul> <p><i>Making</i></p> <ul style="list-style-type: none"> <li>• Identify and use appropriate tools, <b>technologies</b>, materials, and processes for production</li> <li>• Make a step-by-step plan for production and carry it out, making changes as needed</li> <li>• Use materials in ways that minimize waste</li> </ul> <p><i>Sharing</i></p> <ul style="list-style-type: none"> <li>• Decide on how and with whom to <b>share</b> their <b>product</b> and processes</li> <li>• Demonstrate their product to potential users, providing a rationale for the selected solution, modifications, and procedures, using appropriate terminology</li> <li>• Critically evaluate the success of their product, and explain how their design ideas contribute to the individual, family, community, and/or environment</li> <li>• Critically reflect on their design thinking and processes, and evaluate their ability to work effectively both as individuals and collaboratively in a group, including their ability to share and maintain an efficient co-operative work space</li> <li>• Identify new design issues</li> </ul> <p><b>Applied Skills</b></p> <ul style="list-style-type: none"> <li>• Demonstrate an awareness of precautionary and emergency safety procedures in both physical and digital environments</li> <li>• Identify the skills and skill levels needed, individually or as a group, in relation to specific projects, and develop and refine them as needed</li> </ul> <p><b>Applied Technologies</b></p> <ul style="list-style-type: none"> <li>• Choose, adapt, and if necessary learn about appropriate tools and technologies to use for tasks</li> <li>• Evaluate the personal, social, and environmental impacts, including unintended negative consequences, of the choices they make about technology use</li> <li>• Evaluate how the land, natural resources, and culture influence the development and use of tools and technologies</li> </ul>	

## Curricular Competencies – Elaborations

- **research:** seeking knowledge from other people as experts (e.g., First Peoples Elders), secondary sources, and collective pools of knowledge in communities and collaborative atmospheres
- **empathetic observation:** aimed at understanding the values and beliefs of other cultures and the diverse motivations and needs of different people
- **Defining:** setting parameters
- **constraints:** limiting factors such as task or user requirements, materials, expense, environmental impact, issues of appropriation, and knowledge that is considered sacred
- **Ideating:** forming ideas or concepts
- **sources of inspiration:** may include experiences; traditional cultural knowledge and approaches, including those of First Peoples; places, including the land and its natural resources and analogous settings; and people, including users, experts, and thought leaders
- **plan:** for example, pictorial drawings, sketches, flow charts
- **iterations:** repetitions of a process with the aim of approaching a desired result
- **sources of feedback:** may include peers; users; keepers of traditional cultural knowledge and approaches, including those of First Peoples; and other experts
- **appropriate test:** consider conditions, number of trials
- **technologies:** things that extend human capabilities
- **share:** may include showing to others, use by others, giving away, or marketing and selling
- **product:** for example, a physical product, a process, a system, a service, or a designed environment

## Content – Elaborations

- **characteristics:** for example, critical thinking, communication, collaboration, risk taking
- **invention:** an original idea such as Velcro
- **innovation:** changing an existing idea or product, such as ketchup, into something new, such as coloured ketchup