BIG IDEAS

Design for the life cycle includes consideration of social and **environmental impacts**.	Personal design interests require the evaluation and refinement of skills.	Tools and technologies can be adapted for specific purposes.

Learning Standards

Curricular Competencies	Content
Students are expected to be able to do the following:	*Students are expected to know the following:*
Applied Design	• simple drafting design projects
Understanding context	• geometric construction to create **drawings and images**
• Engage in a period of **user-centred research** and **empathetic observation** to understand design opportunities	• **drawing management** and problem solving using computer-assisted design (CAD) software
Defining	• use of scale and proportion when outputting to 3D models
• Establish a point of view for a chosen design opportunity	• geometric dimensioning and tolerancing in both imperial and SI units.
• Identify potential users, intended impact, and possible unintended negative consequences	• types, sizes, and applications of drawing media
• Make decisions about premises and **constraints** that define the design space, and identify criteria for success	• applicable visual formats and media for presenting design solutions
• Determine whether activity is collaborative or self-directed	• technical problem solving using geometry, trigonometry, and algebra
Ideating	• **design for the life cycle**
• Generate ideas and add to others' ideas to create possibilities, and prioritize them for prototyping	• ethics of **cultural appropriation** and plagiarism
• Critically analyze how competing social, ethical, and sustainability considerations impact design	
• Choose an idea to pursue based on success criteria and maintain an open mind about potentially viable ideas	
Prototyping	
• Choose a form for prototyping and develop a **plan** that includes key stages and resources	
• Analyze the design for life cycle and evaluate its **impacts**	
• Visualize and construct prototypes, making changes to tools, materials, and procedures as needed	
• Record **iterations** of prototyping	

Learning Standards (continued)

Curricular Competencies	Content
Testing • Identify and communicate with **sources of feedback** • Develop an appropriate test of the prototype, conduct the test, and collect and compile data • Apply information from critiques, testing results, and success criteria to make changes ***Making*** • Identify appropriate tools, **technologies**, materials, processes, cost implications, and time needed • Create design, incorporating feedback from self, others, and testing prototypes • Use materials in ways that minimize waste ***Sharing*** • Decide on how and with whom to **share** design and processes for feedback • Share the product with users and critically evaluate its success • Critically reflect on their design thinking and processes, and identify new design goals • Identify and analyze new design possibilities, including how they or others might build on their concept **Applied Skills** • Apply safety procedures for themselves, co-workers, and users in both physical and digital environments • Identify and assess skills needed for design interests, individually or collaboratively, and develop specific plans to learn or refine them over time • Develop competency and proficiency in skills at various levels involving manual dexterity and drafting techniques **Applied Technologies** • Explore existing, new, and emerging tools, technologies, and systems to evaluate suitability for their design interests • Evaluate impacts, including unintended negative consequences, of choices made about technology use • Examine the role that advancing technologies play in drafting contexts	