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
Students are expected to be able to do the following: **Applied Design** *Understanding context* • Engage in a period of **research** and **empathetic observation** in order to understand design opportunities ***Defining*** • Choose a design opportunity • Identify potential users and relevant contextual factors • Identify criteria for success, intended impact, and any **constraints** ***Ideating*** • Take creative risks in generating ideas and add to others' ideas in ways that enhance them • Screen ideas against criteria and constraints • Critically analyze and prioritize competing factors, including social, ethical, and sustainability considerations, to meet community needs for preferred futures • Choose an idea to pursue, keeping other potentially viable ideas open *Prototyping* • Identify and use **sources of inspiration** and information • Choose a form for prototyping and develop a **plan** that includes key stages and resources • Evaluate a variety of materials for effective use and potential for reuse, recycling, and biodegradability • Prototype, making changes to tools, materials, and procedures as needed • Record **iterations** of prototyping	*Students are expected to know the following:* • relationship between web structure and content (HTML), style and design, cascading style sheet (CSS) functionality and interactivity (JavaScript) • benefits and drawbacks of online websites and content management system (CMS) **options** • website design **planning tools** • HTML text editing and graphical user interface (GUI) **tools** • user interface **(UI)** and user experience **(UX)** • World Wide Web Consortium **(W3C)** standards and **responsive** and **optimized** web design • **domain and hosting options** • copyright, creative commons, and fair use protocols for media and content • **accessibility** and **functionality** in web design • **writing** for the web • **security and privacy** implications • **database** creation and management • **career options** in web development and the **interpersonal skills** necessary for success in this field

Learning Standards (continued)

Curricular Competencies	Content
Testing • Identify **sources of feedback** • Develop an **appropriate test** of the prototype • Conduct the test, collect and compile data, evaluate data, and decide on changes • Iterate the prototype or abandon the design idea *Making* • Identify and use appropriate tools, **technologies**, materials, and processes for production • Make a step-by-step plan for production and carry it out, making changes as needed • Use materials in ways that minimize waste *Sharing* • Decide on how and with whom to **share** their **product** and processes • Demonstrate their product to potential users, providing a rationale for the selected solution, modifications, and procedures, using appropriate terminology • Critically evaluate the success of their product, and explain how their design ideas contribute to the individual, family, community, and/or environment • 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 • Identify new design issues **Applied Skills** • Demonstrate an awareness of precautionary and emergency safety procedures in both physical and digital environments • Identify the skills and skill levels needed, individually or as a group, in relation to specific projects, and develop and refine them as needed **Applied Technologies** • Choose, adapt, and if necessary learn about appropriate tools and technologies to use for tasks • Evaluate the personal, social, and environmental impacts, including unintended negative consequences, of the choices they make about technology use • Evaluate how the land, natural resources, and culture influence the development and use of tools and technologies	

- **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

- **options:** for example, Wix, Weebly, Google Sites, Wordpress, Joomla, Drupal
- **planning tools:** for example, wireframe mockups, site maps
- **tools:** for example, Notepad++, Brackets, Dreamweaver, Sublime Text, Visual Studio Code
- **UI:** user interface: focus on functionality, consistency of style, and layout
- **UX:** user experience: focus on the flow, feel, and end-user experience of the product
- **W3C:** using online World Standards Cooperation (WSC) validators to check for any errors in the HTML and cascading style sheets (CSS)
- **responsive:** consideration of how content will be displayed across multiple devices, cross-browser compatibility
- **optimized:** for speed of loading, minimal bandwidth requirements, and appropriate image compression types (jpg, gif, png)
- **domain and hosting options:** for example, web hosting options, file transfer protocols (FTP), use of CPanel for website administration, Freedom of Information and Protection of Privacy Act (FOIPPA) concerns; location of hosting

- **accessibility** removing barriers that prevent interaction with or access to websites by all users
- **functionality:** for example, colours, layout, contrast, typography, navigation, information design (ID), functionality, usability, accessibility, and CRAP (contrast, repetition, alignment, and proximity)
- **writing:** for example, user experience, calls to action, concise and persuasive writing, simple language, hyperlinking, bold words, lists for ease of scanning, keywords, tags, copywriting, metadata
- **security and privacy:** for example, secure socket layer (SSL), encryption, password management, data storage, permissions
- **database:** for example, structured query language (SQL), Microsoft Access
- **career options:** for example, account managers, user experience (UX) and user interface (UI) designers, web developers, quality assurance testers, development and operations (dev ops,) project manager, content manager
- **interpersonal skills:** for example, having the teamwork and collaborative skills necessary to succeed in project-based environments