BIG IDEAS

User needs and interests drive the design process.	Social, ethical, and sustainability issues are influenced by design.	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** ***Defining*** • Identify potential users, societal impacts, and other relevant contextual factors for a chosen design opportunity • Identify criteria for success, intended impact, and any **constraints** or possible unintended impacts ***Ideating*** • Screen ideas against criteria and constraints • Critically analyze and prioritize competing **factors** to meet community needs for preferred futures • Maintain an open mind about potentially viable ideas ***Prototyping*** • Identify and use **sources of inspiration** and information • Choose a form for prototyping and develop a **plan** that includes key stages and resources • Prototype, making changes to tools, materials, and procedures as needed • Record **iterations** of prototyping	*Students are expected to know the following:* • design opportunities • **computer hardware**, peripherals, internal and external components, and standards • distinctions between **software types**, cloud-based and desktop applications • intermediate features of **business applications**, including word processing, spreadsheets, and presentations • **operating system shortcuts** and **command line operations** • **preventive maintenance** of hardware and software • **computer security risks** • hardware and software **troubleshooting** • **wired and wireless computer networking** • **evolution of digital technology** and the impact on traditional models of computing • **risks and rewards** associated with big data, multi-device connectivity, and the Internet of Things • principles of **computational thinking** • introductory computer **programming concepts and constructs**

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 ***Sharing*** • Decide on how and with whom to **share product** and processes • Demonstrate the product to potential users, providing a rationale for the selected solution, modifications, and procedures • Use appropriate terminology • Critically reflect on their design thinking and processes, and identify new design goals • Assess their ability to work effectively both as individuals and collaboratively in a group, including ability to share and maintain an efficient collaborative workspace **Applied Skills** • Demonstrate an awareness of precautionary and emergency safety procedures in both physical and digital environments • Identify the skills needed in relation to specific projects, and develop and refine them **Applied Technologies** • Choose, adapt, and if necessary learn more about appropriate tools and technologies to use for tasks • Evaluate **impacts**, including unintended negative consequences, of choices made about technology use • Evaluate the influences of land, natural resources, and culture on the development and use of tools and technologies	• **planning and writing** simple programs, including games • **impacts of computers and technology on society** • **ethical considerations** of technology use, including **cultural appropriation** and **environmental sustainability** • **digital literacy** and digital citizenship • impacts of technology use on personal **health and wellness**

