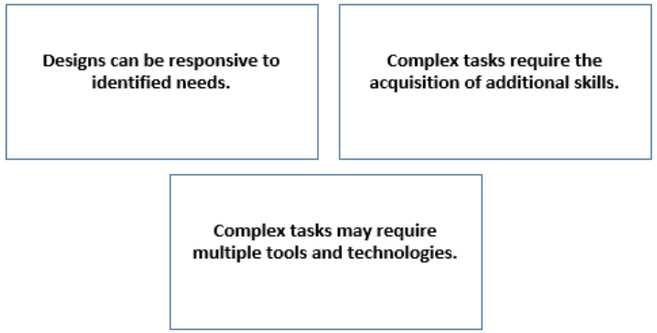
ADST Scope & Sequence

	Grades 6-7 Big Ideas & Learning Standards	Available District Resources	Grades 6 - 7 Content & Computational Thinking
Grades 6 to 7	 **Curricular Competencies** *Students are expected to be able to do the following:* **Applied Design** *Understanding context* • **Empathize** with potential **users** to find issues and uncover needs and potential design opportunities ***Defining*** • Choose a design opportunity • Identify key features or potential users and their requirements • Identify criteria for success and any **constraints** ***Ideating*** • Generate potential ideas and add to others' ideas • Screen ideas against criteria and constraints • Evaluate personal, social, and environmental impacts and ethical considerations • Choose an idea to pursue *Prototyping* • Identify and use **sources of information** • Develop a plan that identifies key stages and resources • Explore and test a variety of materials for effective use • Construct a first version of the **product** or a prototype, as appropriate, making changes to tools, materials, and procedures as needed • Record **iterations** of prototyping	**Available Grades 6 & 7 Resources** Scribbler 2 & 3 (Mac/Win) Spheros (IOS/Android/Windows 10) littleBits kits (electronics-snap together magnets) mBots Makey Makey Standard Kit & booklet of activities Coding Basic Apps	**CONTENT** Students will experience a minimum of three modules of Applied Design, Skills, and Technologies 6–7 in each of Grades 6 and 7. Schools may choose from among the modules listed below or develop new modules that use the Curricular Competencies of Applied Design, Skills, and Technologies 6–7 with locally developed content. Locally developed modules can be offered in addition to, or instead of, the modules in the provincial curriculum. **Computational Thinking** *Students are expected to know the following:* • **simple algorithms** that reflect computational thinking • **visual representations** of problems and data • **evolution of programming languages** • **visual programming** **Module examples for Grades 6 & 7** **Computers and Communications Devices** *Students are expected to know the following:* • computer system architecture, including hardware and software, network infrastructure (local), intranet/Internet, and personal communication devices • strategies for identifying and troubleshooting simple hardware and software problems • function of input and output devices, including 3D printing and adaptive technologies for those with special needs • ergonomics in use of computers and computing devices • effective and efficient keyboarding techniques **Drafting** *Students are expected to know the following:* • technical drawing, including sketching techniques and manual **drafting techniques** • elements of plans and drawings • simple computer-aided **drafting programs**

Curricular Competencies (continued)

Testing

- Test the first version of the product or the prototype
- Gather peer and/or user and/or expert feedback and inspiration
- Make changes, troubleshoot, and test again

Making

- Identify and use appropriate tools, **technologies**, and materials for production
- Make a plan for production that includes key stages, 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
- Demonstrate their product and describe their process, using appropriate terminology and providing reasons for their selected solution and modifications
- Evaluate their product against their criteria and explain how it contributes to the individual, family, community, and/or environment
- 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

Available Grades 6 & 7 Resources

Scribbler 2 & 3 (Mac/Win)

Spheros (IOS/Android/Windows 10)

Coding Basic Apps

littleBits kits (electronics-snap together magnets)

mBot

Makey Makey Standard Kit & booklet of activities

Module examples for Grades 6 & 7 (continued)

Digital Literacy

Students are expected to know the following:

- **Internet safety**
- digital self-image, citizenship, relationships, and communication
- legal and ethical considerations, including creative credit and copyright, and cyberbullying
- methods for **personal media management**
- search techniques, how search results are selected and ranked, and **criteria** for evaluating search results
- strategies to identify **personal learning networks**

Entrepreneurship and Marketing

Students are expected to know the following:

- role of entrepreneurship in designing and making products and services
- market niche
- branding of products, services, institutions, or places
- pricing product/service, including decision to seek profit or break even
- role of basic financial record-keeping and budgeting

Food Studies

Students are expected to know the following:

- basic food handling and simple preparation **techniques** and **equipment**
- factors in ingredient use, including balanced eating/nutrition, function, and **dietary restrictions**
- factors that influence food choices, including cost, availability, and family and cultural influences

Media Arts

Students are expected to know the following:

- **digital and non-digital** media, and their distinguishing characteristics and uses
- **techniques** for using images, sounds, and text to communicate information, settings, ideas, and story structure
- media technologies and techniques to capture, edit, and manipulate images, sounds, and text for specific purposes
- influences of digital media for the purpose of communication and self-expression

Module examples for 6 to 7 (continued)

Applied Skills

- Demonstrate an awareness of precautionary and emergency safety procedures in both physical and digital environments
  Identify and evaluate the skills and skill levels needed, individually or as a group, in relation to a specific task, and develop them as needed

Applied Technologies

- Select, and as needed learn about, appropriate tools and technologies to extend their capability to complete a task
- Identify the personal, social, and environmental impacts, including unintended negative consequences, of the choices they make about technology use
- Identify how the land, natural resources, and culture influence the development and use of tools and technologies

Curricular Competencies-Elaborations 6 to 7

- **Empathize:** share the feelings and understand the needs of others to inform design
- **users:** may include self, peers, younger children, family or community members, customers, plants, or animals
- **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 information:** including seeking knowledge from other people as experts (e.g., First Peoples Elders), secondary sources, and collective pools of knowledge in communities and collaborative atmospheres
- **product:** for example, a physical product, a process, a system, a service, or a designed environment
- **iterations:** repetitions of a process with the aim of approaching a desired result
- **technologies:** things that extend human capabilities
- **share:** may include showing to others, use by others, giving away, or marketing and selling

Content – Elaborations for:

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Metalwork

Students are expected to know the following:

- characteristics and uses of metals
- metalworking **techniques and processes** using **hand tools**
- metals as a non-renewable resource

Power Technology

Students are expected to know the following:

- power is the rate at which energy is transformed
- **forms of energy**
- energy is **conserved**
- devices that **transform energy**

Robotics

Students are expected to know the following:

- a robot is a machine capable of carrying out a complex series of actions automatically
- uses of robotics
- main components of robots: **sensors**, **control systems**, and **effectors**
- various **ways** that objects can move
- programming and logic for robotics components
- various **platforms** for robotics

Textiles

Students are expected to know the following:

- range of **uses** of textiles
- variety of textile **materials**
- **hand construction techniques** for producing and/or repairing textile items
- consumer concerns that influence textile choices, including availability, cost, function (e.g., waterproof), and textile care

Woodwork

Students are expected to know the following:

- ways in which wood is used in local cultural and economic contexts
- characteristics of wood as a material
- **woodworking techniques** and **basic joinery** using **hand tools**

Content – Elaborations for:

Computational Thinking

- **simple algorithms:** for sorting, searching, sequence, selection, and repetition; specific statements to complete a simple task; cryptography and code breaking (e.g., cyphers)
- **visual representations:** graphs, charts, network diagrams, info graphics, flow charts, lists, tables, or arrays
- **evolution of programming languages:** historical perspectives, evolution (e.g., Ada Lovelace, punch cards, Hollerith, Grace Hopper, Alan Turing, Enigma, cyphers)

Digital Literacy

- **Internet safety:** including privacy and security (secured connections, passwords, personal information), digital footprint and dossier, cyberbullying, online scams, and cybercrimes
- **personal media management:** for example, personalization and organization, bookmarks, content management
- **criteria:** accuracy, timeliness, appropriateness, credibility, and bias
- **personal learning networks:** personalized digital instructional tools to enhance learning and engagement (apps, websites, videos, tutorials, games)

Drafting

- **drafting techniques:** geometric concepts and scale, isometric, orthographic, and oblique drawings
- **drafting programs:** for example, SketchUp, 123Design

Entrepreneurship and Marketing

- **market niche:** a subset of the market on which a specific product is focused, created by identifying needs or wants not provided by competitors

Food Studies

- **techniques:** for example, cutting, blending, heating, and chilling foods; storing foods; clean hands and food preparation surfaces
- **equipment:** for example, blender, utensils, knife, scissors, hot plate, stove, solar oven, ice bath, wooden skewers, steam basket, microwave, birch bark container, tagine, wok
- **dietary restrictions:** allergens (e.g., dairy, nuts), sensitivities/intolerances (e.g., gluten)

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Woodwork

- **woodworking techniques:** for example, cutting materials according to plan, layout, sanding methods, abrasive applications
- **basic joinery:** for example, butt joints (with and without dowell), rabbit joints, gluing, nails & screws
- **hand tools:** for example, cordless and corded drills, rotary tool, hammer, screwdriver, backsaw, coping saw, nail set, square, clamp and vise

Media Arts

- **digital and non-digital:** for example, video production, layout and design, graphics and images, photography (digital and traditional), emerging media processes (performance art, collaborative work, sound art, network art)
- **techniques:** for example, crop, print, record/capture, sequence

Metalwork

- **techniques and processes:** for example, bending, cutting, filing, drilling, soldering (with fume extractor)
- **hand tools:** for example, cordless and corded drills, rotary tool, hammer, screwdriver, hacksaw, jeweler's saw, scribe, square, punch, clamp and vise, files

Power Technology

- **forms of energy:** sound, thermal, elastic, nuclear, chemical, magnetic, mechanical, gravitational, and electrical
- **conserved:** the law of conservation of energy — energy cannot be created or destroyed but can be changed
- **transform energy:** for example, electrical to mechanical, elastic to mechanical, chemical to electrical, electrical to light

Robotics

- **sensors:** "sense" — the parts of the robot that allow it to gather information about its environment that guides its behavior
- **control systems:** "think" — the part of the robot that determines the robot's behavior
- **effectors:** "act" — the parts of the robot that do the work
- **ways:** straight line, back-and-forth, round-and-round, zigzag, fast and slow, fixed distances in set patterns
- **platforms:** for example, VEX IQ, LEGO Mindstorms/NXT, Cubelets

Textiles

- **uses:** construction (e.g., sails at Canada Place), automotive, apparel, function (e.g., fire blanket), ceremonial (e.g., regalia)
- **materials:** for example, leather, cedar, wool, cotton, felt, embroidery thread, yarn, grasses and reeds, pine needles, sinew, plastic, used items and fabrics (e.g., food wrappers, old clothing)
- **hand construction techniques:** for example, hand sewing, knitting (needles, arm, spool), crocheting, weaving, darning, up-cycling (e.g., turning an underused item into something else), embellishing existing items