*Linda O’Reilly, 2016*

**GRADES 6-7 ROADMAP**

**APPLIED DESIGN, SKILLS, AND TECHNOLOGY CURRICULUM**

This guide presents a suggested overview for Grades 6-7 applied design, skills, and technology implementation in combination with grade-level content from other areas in cross-curricular activities.

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| **BIG IDEAS**  |  | **BIG IDEAS**  |  | **BIG IDEAS**  |
| **Design can be responsive to identified needs.** |  | **Complex tasks require the acquisition of additional skills.** |  | **Complex tasks may require multiple tools and technologies.** |
| **CURRICULAR COMPETENCIES** |  | **CURRICULAR COMPETENCIES** |  | **CURRICULAR COMPETENCIES** |
| *Students are expected to be able to do the following*:**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 pursu**e**

**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

**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
 |  | *Students are expected to be able to do the following*: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
 |  | *Students are expected to be able to do the following:*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
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| APPLIED DESIGN, SKILLS, AND TECHNOLOGY CURRICULUM GRADES 6-7CONTENT |
| 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. |
| **Computers & Communication Devices** | **Digital Literacy** | Entrepreneurship and Marketing | **Food Studies** | **Media Arts** | **Metalwork** | **Power Technology** |
| 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
 | 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
 | 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
 | 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
 | *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
 | *Students are expected to know the following:** Characteristics and uses of metals
* Metalworking techniques and processes using hand toolsMetals as a non-renewable resource
 | *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
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| **Robotics** | **Textiles** | **Woodwork** |  |  |  |  |
| *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
 | *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
 | *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
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| **Aim:** Develop students’ practical design and making ability, and their creativity in solving real and relevant problems. Through a wide variety of creative and practical activities, students will be taught the knowledge, skills needed to emerge in the process of designing and making.**Provide students with opportunities to**:* Design and make products that solve real and relevant problems within a variety of contexts.
* Use research and exploration, such as the study of different cultures, to identify and understand user needs.
* Use a variety of approaches to generate creative ideas.
* Develop and communicate design ideas using annotated sketches, mathematical modelling, oral and digital presentations, and computer based tools.
* Design a product for a ‘real’ want or need.

**Elaborations (BC Curriculum)*** **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
* **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
* **Share:** may include showing to others, use by others, giving away, or marketing and selling
* **Technologies:** things that extend human capabilities

**Suggested Design Thinking Pattern**1. I have a challenge.
* How do I approach it?
1. I learned something.
* How do I interpret it?
1. I see an opportunity.
* What do I create?
1. I have an idea.
* How do I build it?
1. I tried something.
* How do I evolve it?
 |  | **Technical knowledge*** Apply their understanding of how to strengthen, stiffen and reinforce more complex structures
* Understand how more advanced mechanical systems in their products enable movement and force.
* Understand more advanced electrical systems can be powered and used in their products (for example, series circuits incorporating switches, bulbs, buzzers and motors)
* Apply their understanding of computing to program, monitor and control their products.
* Use computer-aided design to develop and communicate their ideas

**Safety/Physical Environment****Provide students with opportunities to:*** Follow procedures for safety

**Safety/Digital Environment****Provide students with opportunities to:*** Navigate social media safely
* Articulate their media habits and the role of digital media in their lives
* Recognize that anyone can publish on the Internet and that not all sites are equally trustworthy
* Recognize SPAM, the forms it takes, and identify strategies for dealing with it
* Use strategies for guarding against identity theft and scams that try to access their private information online
* Explain the gender stereotypes that exist in video games, virtual worlds and elsewhere on the Internet
 |  | **See Grades 6-7/Technology and Digital Citizenship Continuum below.** |
| **How to Apply Design Thinking in Class: Step by Step**<http://ww2.kqed.org/mindshift/2013/06/26/how-to-use-design-thinking-in-class-step-by-step/>**Material and Resources**Free Registration/Lots of good ideas and lesson plans<https://www.stem.org.uk/elibrary/collection/2891> |  |  |  |  |

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| **DIGITAL LITERACY CURRICULUM ORGANIZERS****Technology Operations and Concepts**Students demonstrate a sound understanding of technology concepts, systems, and operations | **DIGITAL LITERACY COMPETENCIES** | **SUGGESTED LEARNING OPPORTUNITIES/****INSTRUCTIONAL RESOURCES** |
| 1. **Managing and Operation of Digital Devices**
 | **Students in Grade 6-7 will be able to:*** Search, collect, process, evaluate, share, and store data and information using various devices and applications
* Select and use the most appropriate technologies and applications for a task
* Identify successful trouble shooting strategies for minor hardware and software issues and problems
* Operate independently peripheral equipment (scanner, camera)
 | **Grades 6-7****Smart Board:** * Students use tools to create interactive presentations (clone, dual write, shapes, camera, table, flip, order, picture transparency, pens, page recorder, gallery)

**iPhoto:** * Students use advanced editing tools

**Keynote:** * Students incorporate transitions, builds and audio soundtrack

**Pages:*** Students createbrochures and newspaper articles using advanced formattingskills

**iMovie:** * Students will use advanced editing techniques (cut away, picture in picture)

**Garageband:** * Students include soundtracks for digital projects

**Google Earth:*** Students navigate the application to find continents and oceans and the Mariana Trench

**iStop Motion:** * Students learn techniques of stop motion animation to produce a scene from a novel
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| 1. **Keyboarding Continuum**
 | **Students in Grade 6-7 will be able to:*** Use letter keys with proper fingering technique
* Use the space bar, return/enter, and delete/backspace keys, with proper fingering technique
* Use the special keys (command, option, and control)
* Use shift, caps lock, tab, and arrow keys
* Use formal keyboarding skills to type sentences and paragraphs
* Demonstrate proper ergonomics

Increase proficiency and speed in touch typing | **Dance Mat Typing:** * Start at Home Row Keyboarding Skills, progress at own rate through the program to learn correct fingering for keys.

<http://www.bbc.co.uk/guides/z3c6tfr> |

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| **DIGITAL LITERACY CURRICULUM ORGANIZERS****Content Creation**Students create innovative products and processes using digital resources individually and collaboratively.  | **DIGITAL LITERACY COMPETENCIES** | **SUGGESTED LEARNING OPPORTUNITIES/****INSTRUCTIONAL RESOURCES** |
| 1. **Multimedia and Presentation Tools**

**B. Creativity And Innovation** | **Students in Grades 6-7 will be able to:*** Adapt smoothly to new technologies, and integrate them into his/her environment
* Use a variety of technology tools to maximize the impact of a presentation
* Demonstrate an understanding of effective slide formatting and presentation
* Learn new digital technologies by trying them out and/or accessing help

**Students in Grades 6-7 will be able to:*** Demonstrate creative thinking and develop innovative products using technology
* Use design elements to enhance the communication of ideas in creative ways
 | **Grade 6****Notebook Software:** * Students create an interactive presentation

**Keynote:** * Students add effective transitions, builds and audio to enhance content

**iMovie:** * Students edit video clips, compose audio tracks, use cutaway and picture in picture techniques to create a movie production

**iBooks Author:** * Students create electronic books on curriculum related subjects

**Pages:** * Students use Pages word processor to creatively present assignments

**Grade 7****iStop Motion Animation:***-*Students create a stop motion animation film**Keynote:** * Students learn toimport video, add effective transitions, builds and audio to enhance content

**iBooks Author:** * Students create an electronic book which can be read on multiple devices

**Notebook Software:** * Students design interactive models in Notebook Software to explain how the earth’s crust changes

**iMovie:** * Students produce a movie to demonstrate knowledge
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| **DIGITAL LITERACY CURRICULUM ORGANIZERS****My Online Connections**Students explore the concept that people can connect, share, communicate and collaborate with others through the Internet.**Digital identity**Students develop the ability to create and manage one’s online identity and reputation. This includes an awareness of one's online persona and management of the short-term and long-term impact of one's online presence. | **DIGITAL LITERACY COMPETENCIES** | **SUGGESTED LEARNING OPPORTUNITIES/****INSTRUCTIONAL RESOURCES** |
| 1. **Communication and Collaboration**
 | **Students in Grades 6-7 will be able to:*** Communicate information and ideas effectively to multiple audiences using a variety of media and formats
* Use emails and blogs to collaborate and communicate with peers and other audiences
* Collaborate with others to outline common expectations in order to build a strong digital citizenship community
* Participate in society through online engagement in democratic actions (petitions, voting for justice)
 | **Grade 6****ePals:*** Students learn about world cultures and ways to communicate with others online in a classroom setting

**Resource:**www.mediasmarts.ca (Go to educational game link.)**Suggested Activity:*** Online Behaviour and Etiquette

**Grade 7*** Students create a class blog to interact and learn rules of collaboration online
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| **DIGITAL LITERACY CURRICULUM ORGANIZERS****Digital Citizenship**Students understand safe, legal and responsible use of technology and information including the rights to privacy and intellectual property, | **DIGITAL LITERACY COMPETENCIES** | **SUGGESTED LEARNING OPPORTUNITIES/****INSTRUCTIONAL RESOURCES** |
| 1. **Staying Safe Online**
2. **Legal and Ethical Aspects**
3. **Creative Credit and Copyright**
 | **Students in Grade 6-7 will be able to:*** Navigate social media safely
* Articulate their media habits and the role of digital media in their lives
* Recognize that anyone can publish on the Internet and that not all sites are equally trustworthy
* Recognize SPAM, the forms it takes, and identify strategies for dealing with it
* Use strategies for guarding against identity theft and scams that try to access their private information online
* Explain the gender stereotypes that exist in video games, virtual worlds and elsewhere on the Internet

**Students in Grades 6-7 will be able to:*** Understand the dynamics of cyberbullying and describe strategies to deal with cyberbullying
* Understand what it means to be responsible to, and respectful of, their offline and online communities
* Explain the concept of digital footprint and recognize that this information can be searched, copied and passed on

**Students in Grades 6-7 will be able to:*** Recognize copyright and license rules, fair use and rights they have as creators of original works
* Consider legal and ethical principles of use and publication of information
 | **Grades 6-7*** **Digital Citizenship**

<https://www.commonsensemedia.org/video/educators/digital-citizenship>* **Digital Trail**

<https://www.commonsensemedia.org/videos/follow-the-digital-trail>**Grade 6****Resource:**<https://www.commonsensemedia.org/educators/scope-and-sequence>**Suggested Activities:*** Safe Online Talk
* Digital Life 101
* Scams and Schemes

**Resource:**<http://mediasmarts.ca/game/top-secret-grades-6-8>**Suggested Activity:*** Top Secret

**Grade 7****Resource:**<https://www.commonsensemedia.org/educators/scope-and-sequence>**Suggested Activities:*** My Media
* Which Me Should I Be?
* Gender Stereotypes Online

**Resource:**<http://mediasmarts.ca/game/jo-cool-or-jo-fool-grades-6-8>**Suggested Activity:*** Joe Cool

**Grade 6****Resource:**<https://www.commonsensemedia.org/educators/scope-and-sequence>**Suggested Activity:*** Cyberbullying: Be Understanding

**Resource:**<http://www.cbc.ca/newsblogs/yourcommunity/2013/11/teacher-goes-viral-with-lesson-about-dangers-of-posting-online.html>**Suggested Activity:*** Teacher goes viral about online posting

**Grade 7****Resource:**<https://www.commonsensemedia.org/educators/scope-and-sequence>**Suggested Activities:*** Cyberbullying: Crossing The Line
* Trillion Dollar Footprint

**Grade 6****Resource:**<https://www.commonsensemedia.org/educators/scope-and-sequence>**Suggested Activity:*** A Creator’s Rights

**Grade 7****Resource:**<https://www.commonsensemedia.org/educators/scope-and-sequence>**Suggested Activities:*** A Creator’s Responsibility
* Rework, Reuse, Remix
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| **DIGITAL LITERACY CURRICULUM ORGANIZERS****Research Critical Thinking and Decision Making** Students apply digital tools to gather, evaluate, utilize, share and create content as well as competency in computational thinking. | **DIGITAL LITERACY COMPETENCIES** | **SUGGESTED LEARNING OPPORTUNITIES/****INSTRUCTIONAL RESOURCES** |
| 1. **Information Literacy and Processing**

**B. Critical Thinking, Problem Solving and Decision Making** | **Students in Grades 6-7 students will be able to:*** Evaluate and select information sources and digital tools based on a specific task
* Conduct effective and efficient online searches using a variety of search strategies
* Use correct format for citing all online sources

**Grade 6-7 students will be able to:*** Use digital technology to plan and manage activities
* Use digital technology to identify and define problems and questions for investigations
* Analyze data to identify solutions and make informed decisions
* Evaluate teacher-selected or self-selected Internet resources in terms of their usefulness for research
 | **Grade 6-7****Resource:**<https://www.commonsensemedia.org/educators/scope-and-sequence>**Suggested Activities:*** Identifying High Quality Sites (Test before you Trust)
* The Key To Keywords (Fetch Strategy)
* How to Cite a Site

**Grade 6****Resource:**<https://www.commonsensemedia.org/educators/lesson/strategic-searching-6-8>**Suggested Activity:*** Strategic Searching (Make A Search Plan)

**Grade 7****Resource:**<http://mediasmarts.ca/game/allies-and-aliens-mission-critical-thinking>**Suggested Activity:*** Allies and Aliens
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