*Linda O’Reilly, 2016*

**GRADES 4-5 OVERVIEW**

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

This guide presents a suggested ‘roadmap’ for Grades 4-5 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** |
| **Designs can be improved with prototyping and testing** |  | **Skills are developed through practice, effort, and action** |  | | **The choice of technology and tools depends on the task.** |
| **CURRICULAR COMPETENCIES** |  | **CURRICULAR COMPETENCIES** |  | | **CURRICULAR COMPETENCIES** |
| *Students are expected to be able to do the following*:  Applied Design  Understanding context   * Gather information about or from potential users   **Defining**   * Choose a design opportunity * Identify key features or user requirements * Identify the main objective for the design and any constraints   **Ideating**   * Choose a design opportunity * Generate potential ideas and add to others’ ideas * Screen ideas against the objective and constraints * Choose an idea to pursue   **Prototyping**   * Outline a general plan, identifying tools and materials * Construct a first version of the product, making changes to tools, materials, and procedures as needed * Record iterations of prototyping   **Testing**   * Test the product * Gather peer feedback and inspiration * Make changes and test again, repeating until satisfied with the product   **Making**   * Construct the final product, incorporating planned changes   **Sharing**   * Decide on how and with whom to **share** their product * Demonstrate their product and describe their process * Determine whether their product meets the objective and contributes to the individual, family, community, and/or environment * Reflect on their design thinking and processes, and their ability to work effectively both as individuals and collaboratively in a group, including their ability to share and maintain a co-operative work space * Identify new design issues |  | *Students are expected to be able to do the following*:  Applied Skills   * Use materials, tools, and technologies in a safe manner, and with an awareness of the safety of others, in both physical and digital environments * Identify the skills required for a task and develop those skills as needed |  | | *Students are expected to be able to do the following:*  Applied Technologies   * Use familiar tools and technologies to extend their capabilities when completing a task * Choose appropriate technologies to use for specific tasks |
| APPLIED DESIGN, SKILLS, AND TECHNOLOGY CURRICULUM GRADES 4-5  CONTENT | | | | | |
| Students are expected to use the learning standards for Curricular Competencies from Applied Design, Skills, and Technologies 4–5 in combination with grade-level content from other areas of learning in cross-curricular activities to develop foundational mindsets and skills in design thinking and making. | | | | | |
| **Aim:** Develop students’ practical design and making ability, and their creativity in solving real and relevant problems. Students will work in a range of relevant contexts (e.g., leisure, culture, enterprise, industry and the wider environment).  **Provide students with opportunities to**:   * Design and make products that solve real and relevant problems within a variety of contexts. * Make cross-curricular connections to design across grade levels (e.g. use learning from science to help design and make products that work; use learning from mathematics to help design and make products that work. * Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately. * Work in real-life or lifelike situations where they are designing 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 and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages] * Understand and use electrical systems 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:**   * Demonstrate compliance with school rules regarding responsible use of technology * Look for privacy policies and seals of approval when choosing secure sites * Create secure passwords in order to protect their private information and accounts online * Recognize SPAM, the forms it takes, and identify strategies for dealing with it * Protect themselves from online identity theft by thinking critically about the information they share online * Recognize the Internet as a place to develop relationships but not to reveal private information online * Realize how media can play a powerful role in shaping ideas about gender roles | |  | **See Grades 4-5/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 TECHNOLOGY (DLT) | | |
| Computational Thinking (CT) is a way of solving problems, designing systems, and understanding human behaviour that draws on concepts fundamental to computer science. To flourish in today's world, computational thinking has to be a fundamental part of the way people think and understand the world.  Computers and Communication Devices (CCD) Equipment or hardware designed to move information or data from one place to another, in other words, allowing one device to communicate with another Digital Literacy (DL) involves the ability to find meaning in the diverse messages that form our learning environment. Learners must be able to not only locate information, but also to interpret it within the context of our real-life experiences. Digital literacy is the ability to use information meaningfully in all aspects of our daily lives.Information Technology (IT) encompasses evolving processes, systems and tools for creating, storing, retrieving, and modifying information. As students design, share, and adapt knowledge in critical, ethical, purposeful, and innovative ways, they gain perspective on the long-term implications of life in a digital, connected world and develop literacies to responsibly take ownership of such technologies to augment learning and benefit society. BC Ministry of Education 2015 | | |
| **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 4-5 will be able to:**   * Identify components of, and operate digital devices (iPad, MacBook) * Explain the differences between hardware, software and applications * Manipulate objects on an interactive Smart Board to demonstrate learning |  |

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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. **Keyboarding Continuum** | **Students in Grade 4 will be able to:**   * Use Home Row position of fingers on the keyboard * 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, control) * Use shift, caps lock, tab, arrow keys * Use informal keyboarding skills to type words and sentences * Demonstrates proper ergonomics   **Students in Grade 5 will be able to:**   * Use Home Row position of fingers on the keyboard * 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, control) * Use shift, caps lock, tab, and arrow keys with proper fingering technique * Use formal keyboarding skills to type words, sentences and paragraphs * Increase proficiency and speed in keyboarding skills * Demonstrates proper ergonomics | **Dance Mat Typing:**   * Students will progress at own rate through the keyboarding program |

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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 4-5 will be able to:**   * Use word processing application to create and save content * Use menu/tool bar functions including font, size, style, line spacing/margins, to format, edit, and print a document * Copy, paste or format images * Insert and size a graphic in a document * Use digital media as a learning tool   **Students in Grades 4-5 will be able to:**   * Create original digital works as a means of expression * Use design elements to enhance the communication of ideas in creative ways * Apply existing knowledge to generate new ideas, products or processes using digital technology | **Grade 4**  *(Inclusive of Multimedia and Creativity and Innovation)*  **Comic Life App:**   * Students create a book report   **Pages:**   * Students develop word processing skills(changing font colour, style and size, editing words, sentences, inserting pictures, alignments, text boxes, graphic inspector, opacity, alpha, spacing, design layout)   **Keynote / iMovie:**   * Students create a slide show of a digital narrative/nonfiction piece including text, pictures, transitions   **iMovie App:**   * Students create a one minute movie   **Grade 5**  *(Inclusive of Multimedia and Creativity and Innovation)*  **Pages:**   * Students developword processing skills (changing font colour, style and size, editing words, sentences, inserting pictures, alignments, text boxes, graphic inspector, opacity, alpha, spacing, design layout)   **iMovie:**   * Students create a short movie   **Keynote:**   * Students develop slide presentation skills (transitions, layout, build in, build out, slide design)   **Smart Notebook:**   * Students learn to use tools of Notebook Software to make an interactive presentation |

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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 4-5 will be able to:**   * Communicate digitally with others by selecting and using a variety of appropriate communication tools (under teacher supervision) * Participate in communication at a distance with others of different cultures or geographic areas to gain different perspectives of topics * Create projects that use text and various technologies (e.g. drawing program, presentation software) to communicate and exchange ideas * Communicate information and ideas effectively to multiple audiences using a variety of media and formats | **Grades 4-5**  **Resource:**  <https://www.commonsensemedia.org/educators/scope-and-sequence>  **Suggested Activities:**   * Writing respectful emails * Showing Respect online   **Grade 4**  **NFB Pix Stop App:**   * Students in groups of 3 create an iStop Motion movie on Jacques Cartier * **Air Drop:** * Students exchange and edit assignments   **Grade 5**  **Resource:**  [www.mediasmarts.ca](http://www.mediasmarts.ca)  (Go to educational game link.)  **Suggested Activity:**   * Online Behaviour and Etiquette   **EDMODO Networking Site:**   * Students learn to share ideas, connect and collaborate on line with teacher supervision   **Air Drop:**   * Students exchange and edit assignments   **ePals:**   * Students learn about world cultures and ways to communicate with others online in a classroom setting |

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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 Grades 4-5 will be able to:**   * Demonstrate compliance with school rules regarding responsible use of technology * Look for privacy policies and seals of approval when choosing secure sites * Create secure passwords in order to protect their private information and accounts online * Recognize SPAM, the forms it takes, and identify strategies for dealing with it * Protect themselves from online identity theft by thinking critically about the information they share online * Recognize the Internet as a place to develop relationships but not to reveal private information online * Realize how media can play a powerful role in shaping ideas about gender roles   **Students in Grade 4-5 will be able to:**   * Describe cyber-bullying and describe strategies to deal with such a situation * Identify and articulate strategies to protect personal information * Exhibit legal and ethical behavior when using technology and discuss consequences of misuse * Realize that the information they share online leaves a digital footprint * Explain how the digital environment can positively or negatively affect their lives * Recognize that images can be digitally manipulated for positive purposes or to mislead us   **Students in Grade 4-5 will be able to:**   * Explain how copying the work of others and presenting it as one’s own is called plagiarism * Use age-appropriate technologies to locate, collect, organize content from media collections for specific research purposes and cites sources | **Grades 4-5**  **Digital Citizenship**  <https://www.commonsensemedia.org/video/educators/digital-citizenship>  **Digital Trail**  <https://www.commonsensemedia.org/videos/follow-the-digital-trail>  **Grade 4**  **Resource:**  <https://www.commonsensemedia.org/educators/scope-and-sequence>  **Suggested Activities:**   * Strong Passwords * Digital Citizenship Pledge * You Won A Prize   **Resource:**  <http://www.zoeandmolly.ca/app/en>  **Suggested Activity:**   * Zoe and Molly Online   **Resource:**  <http://mediasmarts.ca/game/privacy-playground-first-adventure-three-cyberpigs>  **Suggested Activity:**   * Privacy Playground   **Grade 5**  **Resource:**  <https://www.commonsensemedia.org/educators/scope-and-sequence>  **Suggested Activities:**   * Talking Safely Online * Super Digital Citizen * Privacy Rules   **Resource:**  <http://mediasmarts.ca/game/cybersense-and-nonsense-second-adventure-three-cyberpigs>  **Suggested Activity:**   * Cyber Sense and Nonsense   **Grades 4-5**  **Resource:**  <https://www.commonsensemedia.org/educators/scope-and-sequence>  **Suggested Activities:**   * What’s Cyberbullying? * Strong Passwords * Picture Perfect   **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 4**  **Resource:**  <https://www.commonsensemedia.org/educators/scope-and-sequence>  **Suggested Activity:**   * How to Cite a Site   **Grade 5**  **Resource:**  <https://www.commonsensemedia.org/educators/scope-and-sequence>  **Suggested Activities:**   * How to Cite a Site * How to Cite Pictures |

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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 Grade 4-5 will be able to:**   * Perform basic searches on databases to locate information * Evaluate teacher-selected or self-selected Internet sites in terms of their usefulness for research * Use strategies to increase the accuracy of their keyword searches and rate their effectiveness * Evaluate the validity of Internet content and whether or not sources can be trusted * Use a digital environment for life long learning   **Students in Grades 4-5 will be able to:**   * Use appropriate digital tools to synthesize research information to develop new ideas and/or create new understanding * Collect and analyze data to identify solutions and make informed decisions * Identify and analyze the purpose of media messages (to inform, persuade, and entertain) | **Grade 4**  **Server:**   * Students access materials, outlines and website links from the server to complete research   **K9 Internet Search Engine:**   * Students use basic keyword search terms to find information on a topic   **Resource:**  <https://www.commonsensemedia.org/educators/scope-and-sequence>  **Suggested Activities:**   * The Key to Keywords * How to Cite a Site   **Grade 5**  **Google Earth App:**   * Students access various types of maps, learn compass directions, and view Canadian Geography   **Server:**   * Students access materials, outlines and website links from the server   **K9 Internet Search Engine:**   * Students use more advanced keyword search terms to find information on a topic   **Resource:**  <https://www.commonsensemedia.org/educators/scope-and-sequence>  **Suggested Activities:**   * The Key to Keywords * How to Cite a Site * Strategic Searching   **Grade 4**  **Co-Co’s Adversmarts App** (Free in App Store):   * Students explore food marketing on the Web and use strategies to avoid scams   **Grade 5**  **Resource:**  <https://www.commonsensemedia.org/educators/scope-and-sequence>  **Suggested Activity:**   * Selling Stereotypes |