

## APPENDIX B: THE FRESNO DIGITAL LITERACY & TECHNOLOGY SKILLS

Figure B.1 shows the technology skills and knowledge recommended by the Fresno County Office of Education to support alignment with the technology skills required by the CCSS.

**Figure B.1: Fresno County Office of Education Recommended Digital Literacy and Technology Skills to Support the California CCSS**

SKILLS	GRADES K-2	GRADES 3-5	GRADES 6-8	GRADES 9-12
<b>Category 1. Demonstrate proficiency in the use of computers &amp; applications, as well as an understanding of the concepts underlying hardware, software, and connectivity</b>				
<b>Basic Operations</b>	<ol style="list-style-type: none"> <li>1. Demonstrate beginning steps in using available hardware and applications (e.g., turn on a computer, launch a program, use a pointing device such as a mouse).</li> <li>2. Explain that icons (e.g., recycle bin/trash, folder) are symbols used to signify a command, file, or application.</li> <li>3. Identify, locate, and use letters, numbers, and special keys (e.g., space bar, Shift, Delete) on the keyboard.</li> <li>4. Recognize the functions of basic file menu commands (e.g., New, Open, Close, Save, Print).</li> </ol>	<ol style="list-style-type: none"> <li>1. Demonstrate basic steps in using available hardware and applications (e.g., log into a computer, connect/disconnect peripherals, upload files from peripherals).</li> <li>2. Select a printer, use print preview, and print a document with the appropriate page setup and orientation.</li> <li>3. Use various operating system features (e.g., open more than one application/program, work with menus, use the taskbar/dock).</li> <li>4. Demonstrate intermediate keyboarding skills and proper keyboarding techniques.</li> </ol>	<ol style="list-style-type: none"> <li>1. Use features of a computer operating system (e.g., determine available space on local storage devices and remote storage resources, access the size and format of files, identify the version of an application).</li> <li>2. Identify successful troubleshooting strategies for minor hardware and software issues/problems (e.g., “frozen screen”).</li> <li>3. Independently operate peripheral equipment (e.g., scanner, digital camera, camcorder), if available.</li> <li>4. Identify and use a variety of storage media (e.g., CDs, DVDs, flash drives, school servers, and online storage spaces), and provide a rationale for using a certain medium for a specific purpose.</li> <li>5. Demonstrate keyboarding skills between 25-30 wpm with fewer than 5 errors (For students with disabilities, demonstrate alternate input techniques as appropriate.).</li> </ol>	<ol style="list-style-type: none"> <li>1. Identify the platform, version, properties, function, and interoperability of computing devices including a wide range of devices that compute and/or manage digital media.</li> <li>2. Use online help and other support to learn about features of hardware and software, as well as to assess and resolve problems.</li> <li>3. Install and uninstall software; compress and expand files (if the district allows it).</li> <li>4. Explain effective backup and recovery strategies.</li> <li>5. Explain criteria for evaluating hardware and software appropriate for a given task (e.g., features, versions, capacity).</li> <li>6. Demonstrate keyboarding techniques, including the use of keyboard shortcuts, to complete assignments efficiently and accurately (For students with disabilities, demonstrate alternate input techniques as appropriate.).</li> <li>7. Identify and assess the capabilities and limitations of emerging technologies.</li> </ol>

SKILLS	GRADES K-2	GRADES 3-5	GRADES 6-8	GRADES 9-12
<p><b>Word Processing and Desktop Publishing</b></p>	<p>5. Use a word processing application to write, edit, print, and save simple assignments. 6. Insert and size a graphic in a word processing document.</p>	<p>5. Use menu/tool bar functions in a word processing program (i.e., font size/style, line spacing, margins) to format, edit, and print a document. 6. Copy and paste text and images within a document, as well as from one document to another. 7. Proofread and edit writing using appropriate resources (e.g., dictionary, spell-checker, grammar resources).</p>	<p>6. Demonstrate use of intermediate features in word processing applications (e.g., tabs, indents, headers and footers, end notes, bullet and numbering, tables). 7. Create, save, open, and import a word processing document in different file formats (e.g., RTF, HTML).</p>	<p>8. Apply advanced formatting and page layout features when appropriate (e.g., columns, templates, and styles) to improve the appearance of documents and materials. 9. Use editing features appropriately (e.g., track changes, insert comments). 10. Identify the use of word processing and desktop publishing skills in various careers.</p>
<p><b>Database</b></p>	<p>7. Explain that computers can store and organize information so that it can be searched. 8. Use a simple computer graphing application to display data.</p>	<p>8. Define the term “database” and provide examples from everyday life (e.g., library catalogues, school records, telephone directories). 9. Define terms related to databases, such as “record,” “field,” and “search.” 10. Do simple searches of existing databases (e.g., online library catalog, electronic encyclopedia).</p>	<p>8. Describe the structure and function of a database, using related terms appropriately. 9. Create a simple database, defining field formats and adding new records. 10. Perform simple operations in a database (i.e., browse, sort, filter, search on selected criteria, delete data, enter data). 11. Plan and develop database reports to organize and display information.</p>	<p>11. Explain the importance of designing the structure of a database to meet its intended goals. 12. Duplicate the structure of a database without data. 13. Save database files in various formats. 14. Manipulate non-alphanumeric digital data (e.g., geospatial data from GeoData.gov4, images, audio) within a database. 15. Define the term “metadata,” and explain how metadata describes the structure and workings of an organization's use of information. 16. Use database features to create mailing labels, form letters, and perform mail merges. 17. Identify the use of database skills in various careers.</p>

SKILLS	GRADES K-2	GRADES 3-5	GRADES 6-8	GRADES 9-12
<p><b>Spreadsheet (Tables/Charts and Graphs)</b></p>	<p>--</p>	<p>11. Demonstrate an understanding of the spreadsheet as a tool to record, organize, and graph information.                      12. Identify and explain terms and concepts related to spreadsheets (i.e., cell, column, row, values, labels, chart, graph).                      13. Enter/edit data in spreadsheets and perform calculations using simple formulas (+, -, *, /), observing the changes that occur.</p>	<p>12. Describe the use of spreadsheets to calculate, graph, organize, and present data in a variety of real-world settings.                      13. Create an original spreadsheet, using formulas.                      14. Use various number formats (e.g., scientific notation, percentages, exponents) as appropriate.                      15. Produce simple charts and graphs from a spreadsheet.                      16. Distinguish among different types of charts and graphs, and choose the most appropriate type to represent given data.                      17. Apply advanced formatting features to customize tables, charts, and graphs.</p>	<p>18. Define and use functions of a spreadsheet application (e.g., sort, filter, find).                      19. Enter formulas and functions; use the auto-fill feature in a spreadsheet application.                      20. Explain and use advanced formatting features of a spreadsheet application (e.g., reposition columns and rows, add and name worksheets).                      21. Differentiate between formulas with absolute and relative cell references.                      22. Use multiple sheets within a workbook, and create links among worksheets to solve problems.                      23. Import and export data between spreadsheets and other applications.                      24. Create and use pivot tables.                      25. Explain how various formatting options are used to convey information in charts or graphs.                      26. Identify the use of spreadsheet skills in various careers.</p>

SKILLS	GRADES K-2	GRADES 3-5	GRADES 6-8	GRADES 9-12
<p><b>Internet, Networking, and Online Communication</b></p>	<p>9. Explain that the Internet links computers around the world, allowing people to access information and communicate.</p> <p>10. Demonstrate the ability to use tools in painting and/or drawing programs.</p>	<p>14. Explain and use age-appropriate online tools and resources (e.g., tutorial, assessment, Web browser).</p> <p>15. Save, retrieve, and delete electronic files on a hard drive or school network.</p> <p>16. Explain terms related to the use of networks (e.g., username, password, network, file server).</p> <p>17. Identify and use terms related to the Internet (e.g., Web browser, URL, keyword, World Wide Web, search engine, links).</p> <p>18. Use age-appropriate Internet-based search engines to locate and extract information, selecting appropriate key words.</p>	<p>18. Use Web browsing to access information (e.g., enter a URL, access links, create bookmarks/favorites, print Web pages).</p> <p>19. Identify probable types and locations of Web sites by examining their domain names, and explain that misleading domain names are sometimes created in order to deceive people (e.g., .edu, .com, .org, .gov, .au).</p> <p>20. Explain and correctly use terms related to networks (e.g., LANs, WANs, servers, and routers) and Internet connectivity (e.g., DSL, T1, T3).</p> <p>21. Explain and correctly use terms related to online learning (e.g., IP address, post, thread, Intranet, discussion forum, drop box, account, password).</p> <p>22. Explain that some Web sites require the use of plug-ins and specific browser versions to access content.</p> <p>23. Use e-mail functions and features (e.g., replying, forwarding, attachments, subject lines, signature, and address book.) The use of e-mail is at the school district’s discretion and may be a class-wide activity if students do not have individual accounts.</p>	<p>27. Use search engines and online directories. Explain the differences among various search engines and how they rank results.</p> <p>28. Explain and demonstrate effective search strategies for locating and retrieving electronic information (e.g., using syntax and Boolean logic operators).</p> <p>29. Describe good practices for password protection and authentication.</p> <p>30. Demonstrate a basic understanding of addressing schemes (e.g., IP addresses, DHCP, DNS).</p> <p>31. Identify career options in network technologies.</p>

SKILLS	GRADES K-2	GRADES 3-5	GRADES 6-8	GRADES 9-12
<p><b>Multimedia and Presentation Tools</b></p>	<p>--</p>	<p>19. Create, edit, and format text on a slide.                      20. Create a series of slides and organize them to present research or convey an idea.                      21. Copy and paste or import graphics; change their size and position on a slide.                      22. Use painting and drawing applications to create and edit work.</p>	<p>24. Create a multimedia presentation using various media as appropriate (e.g., audio, video, animations, etc.).                      25. Use a variety of technology tools (e.g., dictionary, thesaurus, grammar-checker, calculator) to maximize the accuracy of work.</p>	<p>32. Identify technology tools (e.g., authoring tools) that can be used to create a multimedia product.                      33. Use a variety of applications to plan, create, and edit multimedia products (e.g., slide presentations, videos, animations, simulations, podcasts).                      34. Link information residing in different applications (e.g., linking a chart in a word-processing document to the spreadsheet where it was created).                      35. Identify career options in multimedia and software development.</p>
<p><b>Web Authoring</b></p>	<p>--</p>	<p>--</p>	<p>--</p>	<p>36. Distinguish between effective and ineffective Web site designs; explain the reasons.                      37. Explain terminology related to Web page authoring (e.g., HTML, URL, links, browsers, plug-ins, Web servers).                      38. Use HTML or Web-authoring tools to create, edit, and publish well organized Web sites with effective navigation.                      39. Explain basic practices that contribute to a Web site's accessibility to people with disabilities (e.g., using alternative text, captioning, consistent structure).                      40. Explain how to test and debug Web files for quality assurance.                      41. Identify career options in Web design, development, and management.</p>

SKILLS	GRADES K-2	GRADES 3-5	GRADES 6-8	GRADES 9-12
<b>Category 2. Demonstrate the responsible use of technology &amp; an understanding of ethics &amp; safety issues in using electronic media at home, in school, and in society</b>				
<b>Ethics</b>	<ol style="list-style-type: none"> <li>1. Follow classroom rules for the responsible use of computers, peripheral devices, and resources.</li> <li>2. Explain the importance of giving credit to media creators when using their work in student projects.</li> </ol>	<ol style="list-style-type: none"> <li>1. Explain and demonstrate compliance with school rules (Acceptable Use Policy) regarding responsible use of computers and networks.</li> <li>2. Explain responsible uses of technology and digital information; describe possible consequences of inappropriate use.</li> <li>3. Explain Fair Use Guidelines for the use of copyrighted materials (e.g., text, images, music, video) in student projects.</li> </ol>	<ol style="list-style-type: none"> <li>1. Explain ethical issues related to privacy, plagiarism, spam, viruses, hacking, and file sharing.</li> <li>2. Explain how copyright law protects the ownership of intellectual property, and explain possible consequences of violating the law.</li> <li>3. Explain fair use guidelines for using copyrighted materials (e.g., images, music, video, text) in school projects.</li> <li>4. Describe appropriate and responsible use of communication tools (e.g., chats, instant messaging, blogs, and wikis).</li> </ol>	<ol style="list-style-type: none"> <li>1. Demonstrate compliance with the school's Acceptable Use Policy.</li> <li>2. Explain issues related to the responsible use of technology (e.g., privacy, security).</li> <li>3. Explain laws restricting the use of copyrighted materials.</li> <li>4. Identify examples of plagiarism, and discuss the possible consequences of plagiarizing the work of others.</li> <li>5. Write correct in-text citations and reference lists for text and images gathered from electronic sources.</li> <li>6. Give examples of the appropriate and responsible use of communication tools (e.g., chats, instant messaging, blogs, wikis).</li> <li>7. Discuss misuse of technology for personal and commercial reasons (e.g., software piracy, unauthorized file sharing/downloading, virus spreading, and hacking); explain possible consequences.</li> </ol>

SKILLS	GRADES K-2	GRADES 3-5	GRADES 6-8	GRADES 9-12
<p><b>Classroom and Society</b></p>	<p>3. Explain why there are rules for using technology at home and at school.                      4. Identify the purpose of a media message (to inform, persuade, or entertain).                      5. Describe how people use many types of technologies in their daily lives.</p>	<p>4. Identify ways in which technology is used in the workplace and in society.                      5. Work collaboratively online with other students under teacher supervision.                      6. Analyze media messages and determine if their purpose is to inform, persuade, or entertain.                      7. Explain that some Web sites and search engines may include sponsored commercial links.                      8. Explain how hardware and applications can enable people with disabilities to learn.</p>	<p>5. Identify and discuss the technology proficiencies needed in the workplace, as well as ways to prepare to meet these demands.                      6. Identify and describe the effect technological changes have had on society.                      7. Explain how technology can support communication and collaboration, personal and professional productivity, and lifelong learning.                      8. Analyze and explain how media and technology can be used to distort, exaggerate, and misrepresent information.                      9. Give examples of hardware and applications that enable people with disabilities to use technology.</p>	<p>8. Design and implement a personal learning plan that includes the use of technology to support lifelong learning goals.                      9. Evaluate the authenticity, accuracy, appropriateness, and bias of electronic resources, including Web sites.                      10. Analyze the values and points of view that are presented in media messages.                      11. Describe devices, applications, and operating system features that offer accessibility for people with disabilities.</p>

SKILLS	GRADES K-2	GRADES 3-5	GRADES 6-8	GRADES 9-12
<p><b>Health and Safety</b></p>	<p>6. Follow the school rules for safe and ethical Internet use (Use of Internet in this grade span is determined by district policy.).</p> <p>7. Demonstrate knowledge of ergonomics and electrical safety when using computers.</p> <p>8. Explain that a password helps protect the privacy of information.</p>	<p>9. Recognize and describe the potential risks and dangers associated with various forms of online communications.</p> <p>10. Identify and explain the strategies used for the safe and efficient use of computers (e.g., passwords, virus protection software, spam filters, popup blockers).</p> <p>11. Demonstrate safe e-mail practices, recognition of the potentially public exposure of e-mail and appropriate e-mail etiquette (if the district allows student e-mail use).</p> <p>12. Identify cyber-bullying and describe strategies to deal with such a situation.</p> <p>13. Recognize and demonstrate ergonomically sound and safe use of equipment.</p>	<p>10. Explain the potential risks associated with the use of networked digital information (e.g., Internet, mobile phones, wireless, LANs).</p> <p>11. Provide examples of safe and unsafe practices for sharing personal information via e-mail and the Internet.</p> <p>12. Explain why computers, networks, and information need to be protected from viruses, intrusion, and vandalism.</p> <p>13. Explain terms associated with the safe, effective, and efficient use of telecommunications/Internet (e.g., password, firewalls, spam, security, Acceptable Use Policy).</p> <p>14. Describe how cyber-bullying can be blocked.</p>	<p>12. Evaluate school and work environments in terms of ergonomic practices.</p> <p>13. Describe and use safe and appropriate practices when participating in online communities (e.g., discussion groups, blogs, social-networking sites).</p> <p>14. Explain and use practices to protect one's personal safety online (e.g., not sharing personal information with strangers, being alert for online predators, reporting suspicious activities).</p> <p>15. Explain ways individuals can protect their technology systems and information from unethical users.</p>

SKILLS	GRADES K-2	GRADES 3-5	GRADES 6-8	GRADES 9-12
<b>Category 3. Demonstrate the ability to use technology for research, critical thinking, problem solving, decision making, communication, collaboration, creativity and innovation.</b>				
<p><b>Research (Gathering and Using Information)</b></p>	<p>1. Use various age-appropriate technologies to locate, collect, and organize information. 2. Review teacher-selected Internet resources and explain why each resource is or is not useful.</p>	<p>1. Locate, download, and organize content from digital media collections for specific purposes, citing sources. 2. Perform basic searches on databases (e.g., library card catalogue, encyclopedia) to locate information, using two or more key words and techniques to refine and limit such searches. 3. Evaluate Internet resources in terms of their usefulness for research. 4. Use content-specific technology tools (e.g., environmental probes, sensors, measuring devices, simulations) to gather and analyze data. 5. Use online tools (e.g., e-mail, online discussion forums, blogs, and wikis) to gather and share information collaboratively with other students, if the district allows.</p>	<p>1. Explain and demonstrate effective searching and browsing strategies when working on projects. 2. Collect, organize, and analyze digital information from a variety of sources, with attribution. 3. Use a variety of computing devices (e.g., probeware, handheld computers, digital cameras, scanners) to collect, analyze, and present information for curriculum assignments.</p>	<p>1. Devise and demonstrate strategies for efficiently collecting and organizing information from electronic sources. 2. Compare, evaluate, and select appropriate electronic resources to locate specific information. 3. Select the most appropriate search engines and directories for specific research tasks. 4. Search for information within an electronic source (e.g., using the find command).</p>

SKILLS	GRADES K-2	GRADES 3-5	GRADES 6-8	GRADES 9-12
<b>Problem Solving</b>	3. Use age-appropriate technologies (e.g., a simple graphing application) to gather and analyze data.	6. With teacher direction, use appropriate technology tools (e.g., graphic organizer) to define problems and propose hypotheses. 7. Use spreadsheets and other applications to make predictions, solve problems, and draw conclusions.	4. Independently use appropriate technology tools (e.g., graphic organizer) to define problems and propose hypotheses. 5. Use and modify databases and spreadsheets to analyze data and propose solutions. 6. Develop and use guidelines to evaluate the content, organization, design, use of citations, and presentation of technologically enhanced projects.	5. Explain and demonstrate how specialized technology tools can be used for problem solving, decision making, and creativity in all subject areas (e.g., simulation software, environmental probes, computer-aided design, geographic information systems, dynamic geometric software, graphing calculators, art and music composition software).

SKILLS	GRADES K-2	GRADES 3-5	GRADES 6-8	GRADES 9-12
<p><b>Communication and Collaboration</b></p>	<p>4. Use a variety of age-appropriate technologies (e.g., drawing program, presentation software) to communicate and exchange ideas.</p>	<p>8. Create projects that use text and various forms of graphics, audio, and video (with proper citations) to communicate ideas.                      9. Use teacher-developed guidelines to evaluate multimedia presentations for organization, content, design, presentation, and appropriate use of citations.                      10. Communicate with other students and other classes using appropriate technology, including e-mail if the district allows it.</p>	<p>7. Plan, design, and develop a multimedia product to present research findings and creative ideas effectively, citing sources.                      8. Identify differences between various media and explain issues associated with repurposing information from one medium to another (e.g., from print to the Web).                      9. Use a variety of telecommunication tools (e.g., e-mail, discussion groups, Web pages, blogs, Web conferences) to collaborate and communicate with peers, experts, and other audiences (at district’s discretion).</p>	<p>6. Use a variety of media to present information for specific purposes (e.g., reports, research papers, presentations, newsletters, Web sites, podcasts, blogs), citing sources.                      7. Demonstrate how the use of various techniques and effects (e.g., editing, music, color, rhetorical devices) can be used to convey meaning in media.                      8. Use online communication tools to collaborate with peers, community members, and field experts as appropriate (e.g., bulletin boards, discussion forums, listservs, Web conferencing).                      9. Plan and implement a collaborative project with students in other classrooms and schools using telecommunications tools (e.g., e-mail, discussion forums, groupware, interactive Web sites, video-conferencing).                      10. Complete at least one online credit or non-credit course or tutorial; discuss the benefits and disadvantages of this method.</p>

Source: Fresno County Office of Education<sup>85</sup>

<sup>85</sup> Figure reproduced, with minor variations, from: “Recommended Digital Literacy & Technology Skills to Support the California Common Core State Standards.” Fresno County Office of Education, pp. 1-2.  
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