*Technology Curriculum Map for K-8th Grade***Based on the National Educational Technology Standards**

**N**=Novice
**B**=Basic
**P**=Proficient
**A**=Advanced

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1** | **Basic Operations and Concepts** | **K** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| **1a** | **Students demonstrate a sound understanding of the nature and operation of technology systems.** | -------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
| 1a1 | Students recognize the major hardware components in a computer system and identify their function and care. | N |  |  |  |  |  |  |  |  |
|  | Students name or label the main parts of a computer system and identify functions of each. |  | B |  |  |  |  |  |  |  |
|  | Students describe how to use basic input devices (keyboard), output devices (printer), and software resources (CD-ROM). |  |  | P |  |  |  |  |  |  |
| Advanced | Students identify characteristics that describe input devices and output devices and name some devices that can provide input and output. |  |  | A |  |  |  |  |  |  |
| 1a2 | Students know how to use the mouse (or track pad) to access an application, indicate a choice, or activate a hyperlink. | N |  |  |  |  |  |  |  |  |
|  | Students know how to start up the computer; locate applications; choose icons to select, open, save, print, and close files; and shut down the computer, monitor, and printer. |  | B |  |  |  |  |  |  |  |
|  | Students name common technology found in homes. |  |  | P |  |  |  |  |  |  |
| Advanced | Students accurately identify common uses of technology found in daily life (at home and in the community). |  |  | A |  |  |  |  |  |  |
| 1a3 | Students recognize symbols and icons used to identify common hardware and software functions within prepared materials (arrow symbol to proceed to next page, underlined and colored text to represent a link). | N |  |  |  |  |  |  |  |  |
|  | Students recognize symbols and icons commonly used in curriculum-related software to identify options (icon of printer, music notes to represent link to music, speaker symbol to represent sound or audio availability.  |  | B |  |  |  |  |  |  |  |
|  | Students identify functions represented by symbols and icons common found in application programs (font, size, bold, underline, alignment, color or type). |  |  | P |  |  |  |  |  |  |
| Advanced | Students recognize functions represented by symbols and icons commonly found in the drawing toolbars of application programs (select, rotate, word art, insert art). |  |  | A |  |  |  |  |  |  |
| 1a4 | Students how to use the keyboard to type letters and numbers and how to use special key functions (delete, shift, arrow keys, space bar) | N |  |  |  |  |  |  |  |  |
|  | Students know how to use correct sitting, hand, and arm positions and fingering to type words and phrases. |  | B |  |  |  |  |  |  |  |
|  | Students know how to use correct sitting, hand, arm, and fingering positions to type complete sentences (including shift key for capital letters, space bar for spacing, and punctuation keys).  |  |  | P |  |  |  |  |  |  |
| Advanced | Students know how to use correct sitting, hand, and arm positions and fingering to type and edit a brief story or message employing the full alphabetic keyboard. |  |  | A |  |  |  |  |  |  |
| 1a5 | Students identify basic care of the computer, monitor, keyboard, mouse or track pad. | N |  |  |  |  |  |  |  |  |
|  | Students discuss how to properly care for and use software media (cd, dvd, flash drive). |  | B |  |  |  |  |  |  |  |
|  | Students how to properly care for and use software media (videotapes, audiotapes). |  |  | P |  |  |  |  |  |  |
| Advanced | Students describe how to properly care for and use the computer system hardware, software, peripherals, and storage media. |  |  | A |  |  |  |  |  |  |
| **1b1** | **Students are proficient in the use of technology (information management).** | **K** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
|  | Students know how to select applications and curriculum-related software by associating icons with resources they wish to access (students understand that clicking an icon or hyperlink may allow them to access applications, or internet resources).  | N |  |  |  |  |  |  |  |  |
|  | Students understand and know how to use basic commands for saving and printing their work, and understand that file names and folders are used to identify and organize stored information and programs. |  | B |  |  |  |  |  |  |  |
|  | Students recognize functions of basic file menu commands and folders to manage and maintain computer files on a hard drive or other storage medium.  |  |  | P |  |  |  |  |  |  |
| Advanced | Students identify software for graphing as a way to gather, organize, and display numerical information; multimedia as a way to organize information and\or illustrate it in a presentation; and access age-appropriate multimedia dictionaries and encyclopedias as resources for gathering information. |  |  | A |  |  |  |  |  |  |
| **1b2** | **Students are proficient in the use of technology (terminology and problem solving).** | **K** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
|  | Students correctly identify technology terminology that labels major technology hardware components (computer, monitor). | N |  |  |  |  |  |  |  |  |
|  | Students identify technology hardware peripherals (speakers, projector) and storage components (hard drive, CD-RW drive), and can name software used for typing, drawing, and electronic slide presentations. |  | B |  |  |  |  |  |  |  |
|  | Students recognize accurate terminology to describe hardware, software, multimedia devices, storage media, and peripherals, and can identify the basic functions of technology resources (hardware and software) commonly used in early elementary classrooms.  |  |  | P |  |  |  |  |  |  |
| Advanced | Students identify characteristics of computers that support multimedia (letters, sound, pictures, and video) and the technology through which these are produced and displayed. |  |  | A |  |  |  |  |  |  |
| **2** | **Social, Ethical, and Human Issues** | **K** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| **2a** | **Students understand the ethical, cultural, and societal issues related to technology** | -------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
|  | Students identify a computer as a machine that helps people work, learn, communicate, and play. | N |  |  |  |  |  |  |  |  |
|  | Students identify ways that the computer is used at home and in school. |  | B |  |  |  |  |  |  |  |
|  | Students identify common uses of information and communication technology in the community and in daily life. |  |  | P |  |  |  |  |  |  |
|  | Students discuss advantages and disadvantages of use of technology, and know how lack of access to technology can affect a person’s access to information, learning opportunities, and future job prospects.  |  |  | A |  |  |  |  |  |  |
| **2b** | **Students practice responsible use of technology systems, information, and software.** | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
|  | Students recognize that using a password protects privacy of information. | N |  |  |  |  |  |  |  |  |
|  | Students recognize that passwords protect the security of technology systems. |  | B |  |  |  |  |  |  |  |
|  | Students recognize that copyright affects how one can use technology systems, information, and software resources. |  |  | P |  |  |  |  |  |  |
| Advanced | Students describe consequences of irresponsible use of technology resources at home and at school. |  |  | A |  |  |  |  |  |  |
| **2c** | **Students develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.** | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
|  | Students recognize technology as a source of information, learning, and entertainment. | N |  |  |  |  |  |  |  |  |
|  | Students understand appropriate uses of computers in the classroom and identify a variety of learning and communications opportunities available through use of technology resources. |  | B |  |  |  |  |  |  |  |
|  | Students describe acceptable and unacceptable computer etiquette and demonstrate how to work cooperatively with peers, family members, and others when using technology in the classroom or at home. |  |  | P |  |  |  |  |  |  |
| Advanced | Students identify places in the community where one can access technology. |  |  | A |  |  |  |  |  |  |
| **3** | **Technology Productivity Tools** | **K** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| **3a** | **Students use technology tools to enhance learning, increase productivity, and promote creativity.** | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
|  | Students know how to navigate developmentally appropriate multimedia resources (interactive books, educational software) to support learning, productivity, and creativity. | N |  |  |  |  |  |  |  |  |
|  | Students create, edit, move, and save using multimedia resources (word processors, writing tools) to communicate and illustrate thoughts, ideas, and stories. |  | B |  |  |  |  |  |  |  |
|  | Students know how to use word processing, drawing tools, presentation software, concept-mapping software, graphing software, and other productivity software to illustrate concepts and convey ideas. |  |  | P |  |  |  |  |  |  |
| Advanced | Students identify the best type of productivity software to use for a certain task. |  |  | A |  |  |  |  |  |  |
| **3b** | **Students use productivity tools to collaborate in constructing technology-enhanced models, prepare publications, and produce other creative works.** | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
|  | Students, with assistance from teacher, parents, or student partners, know how to use developmentally appropriate technology tools to produce creative works. | N |  |  |  |  |  |  |  |  |
|  | Students know how to collaborate to develop, print, and present a document using a word processor, and/or drawing software. |  | B |  |  |  |  |  |  |  |
|  | Students know how to work together to collect and create pictures, images, and charts for development of word-processing reports and electronic presentations. |  |  | P |  |  |  |  |  |  |
| Advanced | Students know how to collaborate to plan, organize, develop, and orchestrate presentation of a multimedia slide show that communicates information and ideas to classmates (and possibly to family members and others). |  |  | A |  |  |  |  |  |  |
| **4** | **Technology Communications Tools** | **K** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| **4a** | **Students use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences.** | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
|  | Students, with assistance from teachers, parents, or student partners, recognize and respond to a bulletin board (or e-mail) posting projected on a large screen by their teacher. | N |  |  |  |  |  |  |  |  |
|  | Students, with assistance from teacher, parents, or student partners, know how to use telecommunications resources (e-mail, teacher-selected web site) to gather information, share ideas, and respond to questions posed by the teacher and other classmates. |  | B |  |  |  |  |  |  |  |
|  | Students, with assistance from teacher, parents, or student partners, identify procedures for safety and securely using telecommunications tools (e-mail, newsgroups) to read, send, or post electronic messages for peers, experts, and other audiences.  |  |  | P |  |  |  |  |  |  |
| Advanced | Students know how to safely and securely use telecommunications tools to read, send, or post electronic messages to peers, experts, and family members.  |  |  | A |  |  |  |  |  |  |
| **4b** | **Students use a variety of media and formats to communicate information and ideas effectively to multiple audiences.**  | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
|  | Students identify media formats (text, clip art, video) demonstrated by their teacher, that are used to communicate ideas.  | N |  |  |  |  |  |  |  |  |
|  | Students, assisted by the teachers, parents, or student partners, know how to select media formats (text, clip art, video) to communicate and share ideas with students in other classrooms. |  | B |  |  |  |  |  |  |  |
|  | Students know how to use a variety of developmentally appropriate media (presentation software, newsletter templates) to communicate ideas relevant to the curriculum to their classmates, families, and others. |  |  | P |  |  |  |  |  |  |
| Advanced | Students know how to independently use a variety of media to gather information and ideas relevant to the curriculum, accurately summarize and illustrate the material, and effectively present the final information using a variety of media. |  |  | A |  |  |  |  |  |  |
| **5** | **Technology Research Tools** | **K** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| **5a** | **Students use technology to locate, evaluate, and collect information from a variety of sources.** | **-------** | **-------** | **-------** | **-------** | **-------** | **-------** | **-------** | **-------** | **-------** |
|  | Students, with assistance from teacher, parents, or student partners, know how to access developmentally appropriate Web resources pre-identified (as a hyperlink) by their teacher or parents. | N |  |  |  |  |  |  |  |  |
|  | Students know how to recognize the Web browser and associate it with accessing linked resources on the Internet. |  | B |  |  |  |  |  |  |  |
|  | Students, with assistance from teacher, parents, or student partners, identify steps for using technology resources, such as CD-ROMs (reference or educational software) and Web-based search engines to locate information on assigned topics in the curriculum. |  |  | P |  |  |  |  |  |  |
| Advanced | Students know how to apply appropriate steps independently to access technology resources such as CD-ROMS (reference or educational software) and Web-based search engines to locate information on assigned topics in the curriculum. |  |  | A |  |  |  |  |  |  |
| **5b** | **Students use technology tools to process data and report results.** | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
|  | (There are no expectations with regard to using databases or other data-processing and report-generating software for this level.) | N |  |  |  |  |  |  |  |  |
|  | (There are no expectations with regard to using databases or other data-processing and report-generating software for this level.) |  | B |  |  |  |  |  |  |  |
|  | Students, with assistance from the teacher, know how to use existing common databases (library catalogs, online archives) to locate, sort, and interpret information on assigned topics in the curriculum. |  |  | P |  |  |  |  |  |  |
| Advanced | Students independently know how to use existing common databases (library catalogs, online archives) to locate, sort, and interpret information on assigned topics in the curriculum. |  |  | A |  |  |  |  |  |  |
| **5c** | **Students evaluate and select new information resources and technological innovations based on the appropriateness for the tasks.** | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
|  | Students identify uses of common hardware components (monitor for viewing, keyboard for typing, earphones for hearing). | N |  |  |  |  |  |  |  |  |
|  | Students chose software that is appropriate for the task they are completing (word processor to write a story or paragraph, drawing program to make a picture). |  | B |  |  |  |  |  |  |  |
|  | Students identify technology resources (simple conceptual mapping software, drawing software) to show steps in a sequence; to demonstrate likeness and differences; and to recognize, record, and organize information related to assigned curricular topics. |  |  | P |  |  |  |  |  |  |
| Advanced | Students provide a logical rationale for choosing one type of hardware or software over another for completing a specific assigned task. |  |  | A |  |  |  |  |  |  |
| **6** | **Technology Problem-Solving and Decision-Making Tools** | **K** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| **6a** | **Students use technology resources for solving problems and making informed decisions.** | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
|  | Students know how to use developmentally appropriate software focused on early learning problem-solving skills (matching, counting, ordering and sequencing, patterns). | N |  |  |  |  |  |  |  |  |
|  | Students know how to use developmentally appropriate software to collect classroom data, create a graph, identify the questions that could be answered by the information in the graph, and interpret the results from the graph. |  | B |  |  |  |  |  |  |  |
|  | Students know how to select information and communication technology tools and resources that can be used to solve particular problems (concept-mapping software to generate and organize ideas for a report, illustrate same or different, or indicate sequence of a story). |  |  | P |  |  |  |  |  |  |
| Advanced | Students know how to use technology resources to access information that can assist them in making informed decisions about everyday matters (which movie to see, time and location of entertainment). |  |  | A |  |  |  |  |  |  |
| **6b** | **Students employ technology in the development of strategies for solving problems in the real world.** | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
|  | Students recognize how technology is used in their home or at school for learning and entertainment. | N |  |  |  |  |  |  |  |  |
|  | Students identify how technology is used on their community to support different types of jobs. |  | B |  |  |  |  |  |  |  |
|  | Students identify ways technology has been used to address real-world problems. |  |  | P |  |  |  |  |  |  |
| Advanced | Students identify a strategy for solving a problem or completing a task by applying information generated using technology tools and resources. |  |  | A |  |  |  |  |  |  |
| **1** | **Basic Operations and Concepts** | **K** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| **1a** | **Students demonstrate a sound understanding of the nature and operation of technology systems.** | **-------** | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
| **1a1** | Students identify characteristics that describe input devices and name some devices that can provide input and output. |  |  |  | N |  |  |  |  |  |
|  | Students describe purposes of specific input and output devices (digital cameras, scanners, printers, file servers) and know how to use keyboarding and mouse pad manipulation efficiently and effectively.  |  |  |  |  | B |  |  |  |  |
|  | Students know how to use basic input and output devices (including adaptive devices as needed); access network resources (printers, file servers); and use common peripherals (scanners, digital cameras). |  |  |  |  |  | P |  |  |  |
| Advanced | Students know how to connect and use a wide variety of input and output devices and common peripherals (scanners, digital cameras), and how to access networked resources. |  |  |  |  |  | A |  |  |  |
| **1a2** | Students accurately identify common uses of technology found in daily life (at home and in the community). |  |  |  | N |  |  |  |  |  |
|  | Students describe common purposes of technology use in daily life at home, school, and in the community (learning, for finding information, for work). |  |  |  |  | B |  |  |  |  |
|  | Students recognize, discuss, and visually represent ways technology has changed life and work at school and in the home, community, business, industry, and government over the past three decades. |  |  |  |  |  | P |  |  |  |
| Advanced | Students know how to explore, identify, and develop presentations describing types of occupations or careers that rely on computer-based technology. |  |  |  |  |  | A |  |  |  |
| **1a3** | Students recognize functions represented by symbols and icons commonly found in the drawing toolbars of application programs (arrange, select, clip art, insert picture). |  |  |  | N |  |  |  |  |  |
|  | Students associate word, symbols, and icons commonly found in the menus and toolbars of application programs (arrange, select, rotate, text box) with their functions. |  |  |  |  | B |  |  |  |  |
|  | Students identify and know how to use menu options in application programs to develop text, graphic, spreadsheet and Web documents; to save, print, format, add multimedia features; to store, access, and manage files; and to use dictionary, thesaurus, and spelling and grammar tools.  |  |  |  |  |  | P |  |  |  |
| Advanced | Students know how to insert photos, graphics, spreadsheets, sound, and video into word-processing, presentation, and Web documents. |  |  |  |  |  | A |  |  |  |
| **1a4** | Students know how to use correct sitting, hand, and arm positions and fingering to type and edit a brief story or message employing the full alphabetic keyboard. |  |  |  | N |  |  |  |  |  |
|  | Students know how to use both alphabetic and numeric keys (located above the alphabetic keys) by touch, using the correct finger of the correct hand to compose and edit a letter or brief report. |  |  |  |  | B |  |  |  |  |
|  | Students know how proper keyboarding position and technique to touch-type using the correct hands for alphabetic, numeric, and special purpose keys (arrow keys, escape key, backspace key); and how to use these keys and the edit menu items to correct errors in a document. |  |  |  |  |  | P |  |  |  |
| Advanced | Students know functions of all alphabetic, numeric, special purpose and symbol keys; can touch-type with correct fingers of correct hands using the full keyboard; and know how to use a word processor to compose, type, proofread, and edit a document.  |  |  |  |  |  | A |  |  |  |
| **1a5** | Students describe how to properly care for and use the computer system hardware, software, peripherals, and storage media. |  |  |  | N |  |  |  |  |  |
|  | Students demonstrate proper care in use of the computer system hardware, software, peripherals, and storage media. |  |  |  |  | B |  |  |  |  |
|  | Students identify characteristics suggesting that the computer needs upgraded system or application software, virus detection software, or spam defense software to protect the information and functioning of the technology system. |  |  |  |  |  | P |  |  |  |
| Advanced | Students know how to locate and use system and application upgrade, virus protection, and spam defense software to keep a technology system working properly. |  |  |  |  |  | A |  |  |  |
| **1b1** | **Students are proficient in the use of technology. (Information management)** | **-------** | ------- | ------- | ------ | ------- | ------- | ------- | ------- | ------- |
|  | Students identify software for graphing as a way to gather, organize, and display numerical information; multimedia as a way to organize information and/or illustrate it in a presentation (draw and label a picture, type and illustrate a story or report); and access age-appropriate multimedia dictionaries and encyclopedias as resources for gathering information. |  |  |  | N |  |  |  |  |  |
|  | Students know how to identify types of files by their icons and extensions; understand that particular file types are accessed through specific applications; and know how to use system menus to access particular files located in different folders and on a variety of internal and external media. |  |  |  |  | B |  |  |  |  |
|  | Students identify basic software commands used to manage and maintain computer files on a hard drive, diskette, or CD-ROM; manage and maintain their files on a network; and know how to exchange files with other students and the teacher via network file sharing and e-mail attachments. |  |  |  |  |  | P |  |  |  |
| Advanced | Students identify software used for information management and know which types of software can be used most effectively for different information needs, and for conveying results to different audiences. |  |  |  |  |  | A |  |  |  |
| **1b2** | **Students are proficient in the use of technology. (terminology and problem solving)** | **-------** | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
|  | Students identify characteristics of computers that support multimedia (letters, sound, pictures, and video) and technology through which these are produced and displayed. |  |  |  | N |  |  |  |  |  |
|  | Students identify correct terminology for describing functions of technology application software (word processor, spreadsheet, and database). |  |  |  |  | B |  |  |  |  |
|  | Students identify correct terminology used to describe basic hardware, software, and networking functions, and to discuss the functions, processes, and/or procedures applied in common use of these technology resources. |  |  |  |  |  | P |  |  |  |
| Advanced | Students identify search strategies for locating information needed, identify resources that contribute to solving a particular problem, organize information, and communicate solution strategies and conclusions using appropriate terminology. |  |  |  |  |  | A |  |  |  |
| **2** | **Social, Ethical, and Human Issues** | **K** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| **2a** | **Students understand the ethical, cultural, and societal issues related to technology.** | **-------** | **-------** | **-------** | **-------** | **-------** | **-------** | **-------** | **-------** | **-------** |
|  | Students discuss advantages and disadvantages of use of technology, and understand how lack of access to technology can affect a person’s access to information, learning opportunities, and future job prospects. |  |  |  | N |  |  |  |  |  |
|  | Students identify cultural and societal issues related to technology. |  |  |  |  | B |  |  |  |  |
|  | Students identify issues related to how information and communication technology supports collaboration, personal productivity, lifelong learning, and assistance for students with disabilities. |  |  |  |  |  | P |  |  |  |
| Advanced | Students evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources. |  |  |  |  |  | A |  |  |  |
| **2b** | **Students practice responsible use of technology systems, information, and software.** | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
|  | Students describe consequences of irresponsible use of technology resources at home and at school. |  |  |  | N |  |  |  |  |  |
|  | Students identify uses for information and communication technology in daily life and discuss implications of ethical and unethical use of current technologies at school and in society. |  |  |  |  | B |  |  |  |  |
|  | Students discuss basic issues related to responsible use of technology and information, identify scenarios describing acceptable and unacceptable computer use, and describe personal consequences of inappropriate use. |  |  |  |  |  | P |  |  |  |
| Advanced | Students identify broad range of issues related to use and misuse of information and communication technology resources (privacy, security, copyright, file sharing, and plagiarism) and discuss laws relating to each. |  |  |  |  |  | A |  |  |  |
| **2c** | **Students develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.** | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
|  | Students identify places in the community where one can access technology. |  |  |  | N |  |  |  |  |  |
|  | Students discuss types of skills that can be developed, information that can be located, and collaborations that can be initiated through use of technology. |  |  |  |  | B |  |  |  |  |
|  | Students identify software or technology-delivered access that is valuable to them, and describe how it improves their ability to communicate, be productive, or achieve personal goals. |  |  |  |  |  | P |  |  |  |
| Advanced | Students identify their personal goals or pursuits and explore technology resources that may assist them in identifying paths leading to their goals or pursuits. |  |  |  |  |  | A |  |  |  |
| **3** | **Technology Productivity Tools** | **K** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| **3a** | **Students use technology tools to enhance learning, increase productivity, and promote creativity.** | ------- | ------- | ------- | ------- | ------ | ------- | ------- | ------- | ------- |
|  | Students identify the best type of productivity software to use for a certain task. |  |  |  | N |  |  |  |  |  |
|  | Students name general productivity tools and identify how the tools are most frequently used in their schoolwork and at home. |  |  |  |  | B |  |  |  |  |
|  | Students identify and apply common productivity software features such as menus and toolbars to plan, create, and edit word-processing documents, spreadsheets, and presentations. |  |  |  |  |  | P |  |  |  |
| Advanced | Students describe how specific productivity tools support personal productivity, remediation of skill deficits, and their capacities for learning in different subjects. |  |  |  |  |  | A |  |  |  |
| **3b** | **Students use productivity tools to collaborate in constructing technology-enhanced models, prepare publications, and produce other creative works.** | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
|  | Students know how to collaborate to plan, organize, develop, and orchestrate presentation of a multimedia slide show that communicates information and ideas to classmates (and possibly to family members and others). |  |  |  | N |  |  |  |  |  |
|  | Students identify technology resources (multimedia authoring, presentation software, Web tools, digital cameras, scanners) used in developing individual and collaborative writing and published knowledge products for audiences inside and outside the classroom. |  |  |  |  | B |  |  |  |  |
|  | Students know procedures for importing and manipulating pictures, images, and charts in word-processing documents and spreadsheets, presentations, and other creative works. |  |  |  |  |  | P |  |  |  |
| Advanced | Students understand basic principles for collaborative product development and identify common roles for group members, typical rules for governing individual group member responsibilities, and cooperative attitudes that facilitate successful teamwork. |  |  |  |  |  | A |  |  |  |
| **4** | **Technology Communications Tools** | **K** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| **4a** | **Students use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences.** | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
|  | Students know how to safely and securely use telecommunications tools to read, send, or post electronic messages to peers, experts, and family members. |  |  |  | N |  |  |  |  |  |
|  | Students know how to use telecommunications to access remote information, to communicate with others in support of direct and independent learning, and to pursue personal interest. |  |  |  |  | B |  |  |  |  |
|  | Students identify telecommunications tools (e-mail, online discussions, and Web environments) and online resources for collaborative projects with other students inside and outside the classroom who are studying similar curriculum-related content. |  |  |  |  |  | P |  |  |  |
| Advanced | Students know how to develop Web-based telecommunications projects (Web Quest) that identify content, challenge other students who access the site to answer questions or give opinions adding to the content, and provide opportunities to evaluate responses or submissions for currency and accuracy. |  |  |  |  |  | A |  |  |  |
| **4b** | **Students use a variety of media and formats to communicate information and ideas effectively to multiple audiences.** | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
|  | Students independently know how to use a variety of media to gather information and ideas relevant to curriculum, accurately summarize and illustrate the material, and effectively present the final information using a variety of media. |  |  |  | N |  |  |  |  |  |
|  | Students identify, discuss, and use multimedia terms, software tools, and design strategies (multimedia authoring, Web tools) to develop and communicate curriculum content. |  |  |  |  | B |  |  |  |  |
|  | Students identify a variety of media and formats to create and edit products (presentations, newsletters, Web pages, portable document format) that communicate syntheses of information and ideas from the curriculum to multiple audiences. |  |  |  |  |  | P |  |  |  |
| Advanced | Students identify how different forms of media can be used within one presentation to communicate effectively with a wide variety of audience participants. |  |  |  |  |  | A |  |  |  |
| **5** | **Technology Research Tools** | **K** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| **5a** | **Students use technology to locate, evaluate, and collect information from a variety of sources.** | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
|  | Students know how to apply appropriate steps independently to access technology resources such as CD-ROMs (reference or educational software) and Web-based search engines to locate information on assigned topics in the curriculum. |  |  |  | N |  |  |  |  |  |
|  | Students use or identify correct terminology to describe technology resources and search strategies for locating information in prepared content area databases. |  |  |  |  | B |  |  |  |  |
|  | Students describe steps for using common Web search engines and basic search functions of other technology resources to locate information, and guidelines for evaluating information from a variety of sources for its relevance to the curriculum. |  |  |  |  |  | P |  |  |  |
| Advanced | Students know how to apply Boolean strategies to narrow the focus of the search for online information. |  |  |  |  |  | A |  |  |  |
| **5b** | **Students use technology tools to process data and report results.** | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
|  | Students independently know how to use common existing common databases (library catalogs, online archives, electronic dictionaries, and encyclopedia) to locate, sort, and interpret information on assigned topics in the curriculum. |  |  |  | N |  |  |  |  |  |
|  | Students identify, discuss, and visually represent how and why databases are widely used to collect and organize information in schools, government, business, and science. |  |  |  |  | B |  |  |  |  |
|  | Students describe how to perform basic queries designed to process data and report results on assigned topics in the curriculum. |  |  |  |  |  | P |  |  |  |
| Advanced | Students know how to plan and develop database reports to organize, explain, and display findings in content areas. |  |  |  |  |  | A |  |  |  |
| **5c** | **Students use technology tools to process data and report results.** | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
|  | Students provide a logical rationale for choosing one type of hardware or software over another for completing a specific assigned task. |  |  |  | N |  |  |  |  |  |
|  | Students know how to select appropriate technology tools and resources evaluating the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information resources. |  |  |  |  | B |  |  |  |  |
|  | Students identify, record, and organize information on assigned topics in the curriculum by selecting and using appropriate information and communication technology tools and resources (slide show, timeline software, database, conceptual mapping). |  |  |  |  |  | P |  |  |  |
| Advanced | Students compare and contrast the functions and capabilities of the database, spreadsheet, and word processor for processing data, calculating, and reporting results. |  |  |  |  |  | A |  |  |  |
| **6** | **Technology Problem-Solving and Decision-Making Tools** | **K** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| **6a** | **Students use technology resources for solving problems and making informed decisions.** | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
|  | Students know how to use technology resources to access information that can assist them in making informed decisions about everyday matters (which movie to see, time and location of entertainment, what product to buy, how to build a kite). |  |  |  | N |  |  |  |  |  |
|  | Students know how to use spreadsheet software to examine, sort, and graph data and to apply formulas to calculate. |  |  |  |  | B |  |  |  |  |
|  | Students know how to apply their knowledge of problem-solving tools to select appropriate technology tools and resources to solve a specific problem or make a decision. |  |  |  |  |  | P |  |  |  |
| Advanced | Students know how to use spreadsheet data and simulations to make predictions, strategize solutions, and evaluate decision regarding steps to take in solving problems. |  |  |  |  |  | A |  |  |  |
| **6b** | **Students employ technology in the development of strategies for solving problems in the real world.** | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
|  | Students identify a strategy for solving a problem or completing a task by applying information generated using technology tools and resources. |  |  |  | N |  |  |  |  |  |
|  | Students know how to use technology resources (calculators, data collection probes, videos, educational software) for problem solving, self-directed learning, and extended learning activities. |  |  |  |  | B |  |  |  |  |
|  | Students know how to select and use information and communication technology tools and resources to collect, organize, and evaluate information relevant to a real-world problem. |  |  |  |  |  | P |  |  |  |
| Advanced | Students recognize and discuss how spreadsheets are used to calculate, graph, and represent data in a variety of setting (schools, government, business, industry, mathematics, science). |  |  |  |  |  | A |  |  |  |
| **1** | **Basic Operations and Concepts** | **K** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| **1a** | **Students demonstrate a sound understanding of the nature and operation of technology systems.** | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
| **1a1** | Students know how to connect and use a wide variety of input and output devices and common peripherals (scanners, digital probes, digital cameras, and video projectors), and how to access networked resources. |  |  |  |  |  |  | N |  |  |
|  | Students discuss common hardware and software problems and identify strategies for trouble shooting and solving minor hardware and software problems.  |  |  |  |  |  |  |  | B |  |
|  | Students recognize hardware and software components used to provide access to network resources and know how common peripherals (scanners, digital cameras, and video projectors) are accessed, controlled, connected, and used effectively and efficiently. |  |  |  |  |  |  |  |  | P |
| Advanced | Students describe strategies for identifying, solving, and preventing routine hardware and software problems that occur during everyday technology use. |  |  |  |  |  |  |  |  | A |
| **1a2** | Students know how to explore, identify, and develop presentations describing types of occupations or careers that rely on computer based technology. |  |  |  |  |  |  | N |  |  |
|  | Students know how to apply search engines, word processors, databases, spreadsheets, timelines, charts or graphs, communications, surveys, and other technology based research and analysis tools to organize, synthesis, interpret, and communicate results from data collected regarding technological advances over time and the effects of the changes on occupations in business, industry, education, and other areas. |  |  |  |  |  |  |  | B |  |
|  | Students know how to evaluate, select, and use appropriate technology tools and information resources to plan, design, develop, and communicate content information, appropriately addressing the target audience and providing accurate citations for sources. |  |  |  |  |  |  |  |  | P |
| Advanced | Students know how to research and evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources concerning real-world problems. |  |  |  |  |  |  |  |  | A |
| **1a3** | Students know how to insert photos, graphics, graphs, spreadsheets, sound, and video into word-processing, presentation, and Web documents. |  |  |  |  |  |  | N |  |  |
|  | Students know how to use application features (columns, tables, headers and footers, borders, drawing menu bar) and a variety of other toolbars to format and publish content projects and products. |  |  |  |  |  |  |  | B |  |
|  | Students know how to identify appropriate file formats for a variety of applications and apply utility programs to convert formats, as necessary, for effective use in Web, video, audio, graphic, presentation, word-processing, database, publication, and spreadsheet applications. |  |  |  |  |  |  |  |  | P |
| Advanced | Students demonstrate an understanding of concepts underlying hardware, software, and connectivity; the variety of ways that information and technology resources can be combined to develop and promote understanding; and the value of visual and auditory features to convey accurate and convincing information. |  |  |  |  |  |  |  |  | A |
| **1a4** | Students know functions of all alphabetic, numeric, special purpose and symbol keys; can touch-type with correct fingers of correct hands using the full keyboard; and know how to use a word processor to compose, type, proofread, and edit a document. |  |  |  |  |  |  | N |  |  |
|  | Students know how use proper keyboarding posture, hand and finger positions, and touch-typing techniques to improve accuracy, speed, and general efficiency in computer operation. |  |  |  |  |  |  |  | B |  |
|  | Students know how to use the electronic dictionary, thesaurus, spelling and grammar checker, and editing features to maximize accuracy in development of technology-produced products. |  |  |  |  |  |  |  |  | P |
| Advanced | Students know how to select and use technology tools efficiently and effectively to collect, analyze, display data for class assignments, projects, and presentations. |  |  |  |  |  |  |  |  | A |
| **1a5** | Students know how to locate and use system and application upgrade, virus protection, and spam defense software to keep a technology system working properly. |  |  |  |  |  |  | N |  |  |
|  | Students research and compare features of different virus protection, spam defense, and firewall software, and present features of each. |  |  |  |  |  |  |  | B |  |
|  | Students examine changes in hardware and software systems over time, and identify how changes affect business, industry, education, government, and individual users. |  |  |  |  |  |  |  |  | P |
|  | Students know how to make informed choices among technology systems, resources, and services. |  |  |  |  |  |  |  |  | A |
| **1b1** | **Students are proficient in the use of technology. (Information management)** | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
|  | Students identify software used for information management and know which types of software can be used most effectively for different types of data, different information needs, and for conveying results to different audiences. |  |  |  |  |  |  | N |  |  |
|  | Students know how to organize materials in files and folders, sort files and e-mail lists (by file name and date), and sort data within application programs (word-processing tables, spreadsheets, and databases). |  |  |  |  |  |  |  | B |  |
|  | Students identify strategies and procedures for efficient and effective management and maintenance of computer files in a variety of different media and formats on a hard drive and network. |  |  |  |  |  |  |  |  | P |
| Advanced | Students identify information storage devices and strategies used most efficiently and effectively for storing different types of data, for different purposes, for portability, and for very large files. |  |  |  |  |  |  |  |  | A |
| **1b2** | **Students are proficient in the use of technology. (terminology and problem-solving)** | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
|  | Students identify search strategies for locating information needed, identify resources that contribute to solving a particular problem, organize information, and communicate solution strategies and conclusions using appropriate terminology. |  |  |  |  |  |  | N |  |  |
|  | Students select correct terminology and concepts associated with hardware, software, computer systems, networks, Internet connectivity, and technology applications (word processor, database, spreadsheet, multimedia, telecommunications, drawing) and other digital resources. |  |  |  |  |  |  |  | B |  |
|  | Students know how to solve basic hardware, software, and network problems that occur during everyday use; protect computers, networks, and information from viruses, vandalism, and unauthorized use; and access online help and user documentation to solve common hardware, software, and network problems. |  |  |  |  |  |  |  |  | P |
| Advanced | Students use accurate terminology and select appropriate tools and technology resources to accomplish a variety of task and solve problems. |  |  |  |  |  |  |  |  | A |
| **2** | **Social, Ethical, and Human Issues** | **K** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| **2a** | **Students understand the ethical, cultural, and societal issues related to technology.** | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
|  | Students evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources. |  |  |  |  |  |  | N |  |  |
|  | Students recognize, discuss, and visually represent current changes in information technologies and the effect those have on the workplace and society. |  |  |  |  |  |  |  | B |  |
|  | Students identify legal and ethical issues related to use of information and communication technology, recognize consequences of its misuse, and predict possible long-range effects of ethical and unethical use of technology on culture and society. |  |  |  |  |  |  |  |  | P |
| Advanced | Students identify capabilities and limitations of contemporary and emerging technology resources. |  |  |  |  |  |  |  |  | A |
| **2b** | **Students practice responsible use of technology systems, information, and software.** | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
|  | Students identify a broad range of issues related to use and misuse of information and communication technology resources (privacy, security, copyright, file sharing, and plagiarism) and discuss laws relating to each. |  |  |  |  |  |  | N |  |  |
|  | Students identify and develop scenarios or examples that illustrate ethical behaviors for use of personal copyrighted media (images, music, video, content, language, correctly formatted citations for the copyrighted materials). |  |  |  |  |  |  |  | B |  |
|  | Students discuss issues related to acceptable and responsible use of information and communication technology (privacy, security, copyright, file sharing, plagiarism), analyze the consequences and costs of unethical use of information and computer technology (hacking, spamming, consumer fraud, virus setting, intrusion), and identify methods for addressing these risks. |  |  |  |  |  |  |  |  | P |
| Advanced | Students identify and discuss terms and concepts associated with safe, effective, and efficient use of the Internet and telecommunications resources (password, firewall, spam, security, fair use, acceptable use policy [AUP], Internet use policy [IUP], release form) and recognize strategies that demonstrate ethical, legal, and socially responsible use of technology and electronic resources. |  |  |  |  |  |  |  |  | A |
| **2c** | **Students develop positive attitudes toward technology use that support lifelong learning, collaboration, personal pursuits, and productivity.** | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
|  | Students identify their personal goals or pursuits and explore technology resources that may assist them in identifying paths leading to their goals or pursuits. |  |  |  |  |  |  | N |  |  |
|  | Students identify how they currently use technology and predict how they may use and benefit from its use in their future. |  |  |  |  |  |  |  | B |  |
|  | Students examine issues related to computer etiquette and discuss means for encouraging more effective use of technology to support effect communication, collaboration, personal productivity, lifelong learning, and assistance for individuals with disabilities. |  |  |  |  |  |  |  |  | P |
| Advanced | Students identify and present a strategy they would use for preparing for a job interview in a career for which they have had little or no training. |  |  |  |  |  |  |  |  | A |
| **3** | **Technology Productivity Tools** | **K** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| **3a** | **Students use technology tools to enhance learning, increase productivity, and promote creativity.** | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
|  | Students describe how specific productivity tools support personal productivity, remediation of skill deficits, and their capacities for learning in different subjects. |  |  |  |  |  |  | N |  |  |
|  | Students know how to use content-specific hardware and software (environmental probes, graphing calculators, exploratory environments, and simulations, Web tools) to support learning, research, productivity, and creative thinking. |  |  |  |  |  |  |  | B |  |
|  | Students describe and apply common software features (spellchecker and thesaurus to ensure accuracy of word-processing documents; formulas and chart generation in spreadsheets, and insertion of pictures, movie, sound, and charts into presentation software) to enhance communication to an audience, promote productivity, and support creativity. |  |  |  |  |  |  |  |  | P |
| Advanced | Students know how to use technology tools and resources for managing and communicating personal, professional, or education information (managing finances, schedules, addresses, purchases, e-mail addresses, citations). |  |  |  |  |  |  |  |  | A |
| **3b** | **Students use productivity tools to collaborate in constructing technology-enhanced models, prepare publications, and produce other creative works.** | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
|  | Students understand basic principles for collaborative product development; they identify common roles for group members, typical rules governing individual group member responsibilities, and cooperative attitudes that facilitate successful teamwork. |  |  |  |  |  |  | N |  |  |
|  | Students know how to work in teams to use hardware and software tools (concept-mapping software, word processor, database, spreadsheet, publishing software, puzzle development software) to support learning, research, productivity, and creativity. |  |  |  |  |  |  |  | B |  |
|  | Students describe how to use online environments or other collaborative tools to facilitate design and development of materials, models, publications, and presentations; they know how to apply utilities for editing pictures, images, and charts. |  |  |  |  |  |  |  |  | P |
| Advanced | Students know how to work collaboratively to design, develop content for, and construct a Web-based publication. |  |  |  |  |  |  |  |  | A |
| **4** | **Technology Communication Tools** | **K** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| **4a** | **Students use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences.** | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
|  | Students know how to develop Web-based telecommunications projects (Web Quest) that identify content, challenge other students who access the site to answer questions or give opinions adding to the content, and provide opportunity to evaluate responses or submissions for currency and accuracy. |  |  |  |  |  |  | N |  |  |
|  | Students know how to identify, evaluate, select, and use collaborative tools to survey, collect, share, and communication information within and outside the school community. |  |  |  |  |  |  |  | B |  |
|  | Students know how to use telecommunications tools (e-mail, discussion groups, and online collaborative environments) to exchange data collected and learn curricular concepts by communicating with peers, experts, and other audiences. |  |  |  |  |  |  |  |  | P |
| Advanced | Students know how to develop evaluation criteria for use in judging the quality of published (print, digital, video) materials for group projects; plan, develop, and present content-based group projects based on the criteria; and conduct peer reviews of the group projects using the criteria. |  |  |  |  |  |  |  |  | A |
| **4b** | **Students use a variety of media and formats to communicate information and ideas effectively to multiple audiences.** | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
|  | Students identify how different forms of media can be used within one presentation to communicate effectively with a wide variety of audience participants. |  |  |  |  |  |  | N |  |  |
|  | Students demonstrate knowledge of multimedia tools and concepts used by the media industry (music, games, video, and radio, TV, Web sites) to entertain, sell, and influence ideas and opinions. |  |  |  |  |  |  |  | B |  |
|  | Students know how to use a variety of media and formats to design, develop, publish, and present products (presentations, newsletters, Web pages) that effectively communicate information and ideas about the curriculum to multiple audiences. |  |  |  |  |  |  |  |  | P |
| Advanced | Students know how to plan, design, and develop a multimedia product using data (graphs, charts, database reports) to present content information. |  |  |  |  |  |  |  |  | A |
| **5** | **Technology Research Tools** | **K** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| **5a** | **Students use technology to locate, evaluate, and collect information from a variety of sources.** | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
|  | Students know how to apply Boolean strategies to narrow the focus of the search for online information. |  |  |  |  |  |  | N |  |  |
|  | Students know how to search, collect, and evaluate resources from a variety of locations online, and construct a linked list of resources (information research, data, photos, video clips, illustrations, and graphics) to support content learning and project development. |  |  |  |  |  |  |  | B |  |
|  | Students know how to conduct an advanced search using Boolean logic and other sophisticated search functions; they know how to evaluate information from a variety of sources for accuracy, bias, appropriateness, and comprehensiveness. |  |  |  |  |  |  |  |  | P |
| Advanced | Students know how to research and evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information. |  |  |  |  |  |  |  |  | A |
| **5b** | **Students use technology tools to process data and report results.** | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
|  | Students know how to plan and develop database reports to organize, display, and explain findings in content areas. |  |  |  |  |  |  | N |  |  |
|  | Students know how to search and sort information in an electronic database using multiple criteria, add and delete records, and identify strategies for finding specific information. |  |  |  |  |  |  |  | B |  |
|  | Students know how to identify and implement procedures for designing, creating, and populating, a database; and, in performing queries, to process data and report results relevant to an assigned hypothesis or research question. |  |  |  |  |  |  |  |  | P |
| Advanced | Students know how to create, edit, and modify a database report and identify trends reflecting analysis of the data. |  |  |  |  |  |  |  |  | A |
| **5c** | **Students evaluate and select new information resources and technological innovations based on the appropriateness for specific task.** | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
|  | Students compare and contrast the functions and capabilities of the database, spreadsheet, and word processor for processing data, calculating, and reporting results. |  |  |  |  |  |  | N |  |  |
|  | Students know how to select information and technological resources based on the appropriateness and efficiency for completing task, providing the desired information, or addressing the identified objectives. |  |  |  |  |  |  |  | B |  |
|  | Students know how to select and use information and communication technology tools and resources to collect and analyze information and report results on an assigned hypothesis or research question. |  |  |  |  |  |  |  |  | P |
| Advanced | Students know how to select and use technology tools to efficiently analyze and display data. |  |  |  |  |  |  |  |  | A |
| **6** | **Technology Problem-Solving and Decision-Making Tools** | **K** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| **6a** | **Students use technology resources for solving problems and making informed decisions.** | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
|  | Students know how to use spreadsheet data and simulations to make predictions, strategize solutions, and evaluate decisions regarding steps to take in solving problems. |  |  |  |  |  |  | N |  |  |
|  | Students know how to integrate data-gathering instruments (probes, electronic calculators, handheld devices) with spreadsheets, use data analysis tools within the spreadsheet to analyze the data, graph results, and inform conclusions drawn from the data. |  |  |  |  |  |  |  | B |  |
|  | Students identify two or more types of information and communication technology tools or resources that can be used for informing and solving a specific problem and presenting results, or for identifying and presenting an informed rationale for a decision. |  |  |  |  |  |  |  |  | P |
| Advanced | Students develop strategies for use of data analysis, models, and simulations to make specific decisions regarding a course of action for solving real-world problems. |  |  |  |  |  |  |  |  | A |
| **6b** | **Students employ technology in the development of strategies for solving problems in the real world.** | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
|  | Students recognize and discuss how spreadsheets are used to calculate, graph, and represent data in a variety of settings (schools, government, business, industry, mathematics, science). |  |  |  |  |  |  | N |  |  |
|  | Students know how to apply formulas, functions, and “what if” statements in spreadsheets and graphs or charts to analyze and interpret data for content assignments. |  |  |  |  |  |  |  | B |  |
|  | Students describe the information communication technology tools they might use to compare information from different sources, analyze findings, determine the need for additional information, and draw conclusions for addressing real-world problems. |  |  |  |  |  |  |  |  | P |
| Advanced | Students know how to identify a problem; develop a solution strategy; collect data on effectiveness of the strategy; and analyze, interpret, publish, and present the data and conclusions based on real-world data. |  |  |  |  |  |  |  |  | A |