Technology Applications, Grade 6

Subject: Technology Applications
Grade: 06
Expectations: 36
Breakouts: 88

(a) Introduction.

1. Technology includes data communication, data processing, and the devices used for these tasks locally and across networks. Learning to apply these technologies motivates students to develop critical-thinking skills, higher-order thinking, and innovative problem solving. Technology applications incorporates the study of digital tools, devices, communication, and programming to empower students to apply current and emerging technologies in their careers, their education, and beyond.

2. The technology applications Texas Essential Knowledge and Skills (TEKS) consist of five strands that prepare students to be literate in technology applications by Grade 8: computational thinking; creativity and innovation; data literacy, management, and representation; digital citizenship; and practical technology concepts. Communication and collaboration skills are embedded across the strands.

    a. Computational thinking. Students break down the problem-solving process into four steps: decomposition, pattern recognition, abstraction, and algorithms.

    b. Creativity and innovation. Students use innovative design processes to develop solutions to problems. Students plan a solution, create the solution, test the solution, iterate, and debug the solution as needed, and implement a completely new and innovative product.

    c. Data literacy, management, and representation. Students collect, organize, manage, analyze, and publish various types of data for an audience.

    d. Digital citizenship. Students practice the ethical and effective application of technology and develop an understanding of cybersecurity and the impact of a digital footprint to become safe, productive, and respectful digital citizens.

    e. Practical technology concepts. Students build their knowledge of software applications and hardware focusing on keyboarding and use of applications and tools. Students also build their knowledge and use of technology systems, including integrating the use of multiple applications.

3. The technology applications TEKS can be integrated into all content areas and can support stand-alone courses. Districts have the flexibility of offering technology applications in a variety of settings, including through a stand-alone course or by integrating the technology applications standards in the essential knowledge and skills for one or more courses or subject areas.

4. Statements containing the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.

(b) Knowledge and Skills Statements

(1) Computational thinking--foundations. The student explores the core concepts of computational thinking, a set of problem-solving processes that involve decomposition, pattern recognition, abstraction, and algorithms. The student is expected to:

(A) decompose real-world problems into structured parts by using visual representation;

 (i) decompose real-world problems into structured parts by using visual representation

(B) analyze the patterns and sequences found in visual representations such as learning maps, concept maps, or other representations of data;

 (i) analyze the patterns found in visual representations

 (ii) analyze the sequences found in visual representations

(C) define abstraction and distinguish between generalized information and specific information in the context of solving a problem or completing a task;

 (i) define abstraction

 (ii) distinguish between generalized information and specific information in the context of solving a problem or completing a task

(D) design a plan collaboratively using visual representation to document a problem, possible solutions, and an expected timeline for the development of a coded solution;

 (i) design a plan collaboratively using visual representation to document a problem for the development of a coded solution

 (ii) design a plan collaboratively using visual representation to document possible solutions for the development of a coded solution

 (iii) design a plan collaboratively using visual representation to document an expected timeline for the development of a coded solution

(E) analyze different techniques used in debugging and apply them to an algorithm; and

 (i) analyze different techniques used in debugging

 (ii) apply them [different techniques used in debugging] to an algorithm

(F) analyze the benefits of using iteration (code and sequence repetition) in algorithms.

 (i) analyze the benefits of using iteration (code and sequence repetition) in algorithms

(2) Computational thinking--applications. The student applies the fundamentals of computer science. The student is expected to:

(A) define and label variables that relate to their programming or algorithm; and

 (i) define variables that relate to their programming or algorithm

 (ii) label variables that relate to their programming or algorithm

(B) use a design process to create block-based and text-based programs that include sequences, loops, conditionals, and events to solve an everyday problem.

 (i) use a design process to create block-based programs that include sequences, to solve an everyday problem

 (ii) use a design process to create block-based programs that include loops, to solve an everyday problem

 (iii) use a design process to create block-based programs that include conditionals, to solve an everyday problem

 (iv) use a design process to create block-based programs that include events, to solve an everyday problem

(v)   use a design process to create text-based programs that include sequences, to solve an everyday problem

(vi)   use a design process to create text-based programs that include loops, to solve an everyday problem

(vii)   use a design process to create text-based programs that include conditionals, to solve an everyday problem

(viii)   use a design process to create text-based programs that include events, to solve an everyday problem

(3) Creativity and innovation--innovative design process. The student takes an active role in learning by using a design process and creative thinking to develop and evaluate solutions, considering a variety of local and global perspectives. The student is expected to:

    (A) resolve challenges in design processes independently using goal setting and personal character traits such as demonstrating courage and confidence;

        (i)   resolve challenges in design processes independently using goal setting

        (ii)   resolve challenges in design processes independently using personal character traits

    (B) discuss and implement a design process using digital tools to compare, contrast, and evaluate student-generated outcomes; and

        (i)   discuss a design process using digital tools to compare [and] contrast student-generated outcomes

        (ii)   discuss a design process using digital tools to evaluate student-generated outcomes

        (iii)   implement a design process using digital tools to compare, contrast student-generated outcomes

        (iv)   implement a design process using digital tools to evaluate student-generated outcomes

    (C) identify how the design process is used in various industries.

        (i)   identify how the design process is used in various industries

(4) Creativity and innovation--emerging technologies. The student demonstrates a thorough understanding of the role of technology throughout history and its impact on societies. The student is expected to:

    (A) discuss how changes in technology throughout history have impacted various areas of study;

        (i)   discuss how changes in technology throughout history have impacted various areas of study

    (B) discuss how global trends impact the development of technology; and

        (i)   discuss how global trends impact the development of technology

    (C) transfer current knowledge to the learning of newly encountered technologies.

        (i)   transfer current knowledge to the learning of newly encountered technologies

(5) Data literacy, management, and representation--collect data. The student uses advanced digital strategies to collect and represent data. The student is expected to:

    (A) demonstrate how data can be represented in Boolean expression; and

        (i)   demonstrate how data can be represented in Boolean expression

(B) discuss and use advanced search strategies, including keywords, Boolean operators, and limiters.

    (i) discuss advanced search strategies, including keywords

    (ii) discuss advanced search strategies, including Boolean operators

    (iii) discuss advanced search strategies, including limiters

    (iv) use advanced search strategies, including keywords

    (v) use advanced search strategies, including Boolean operators

    (vi) useadvanced search strategies, including limiters

(6) Data literacy, management, and representation--organize, manage, and analyze data. The student uses digital tools to transform data, make inferences, and predictions. The student is expected to use digital tools to transform data in order to identify and discuss trends and make inferences.

    (A) use digital tools to transform data in order to identify and discuss trends and make inferences.

        (i) use digital tools to transform data in order to identify trends

        (ii) use digital tools to transform data in order to discuss trends

        (iii) use digital tools to transform data in order to identify and make inferences

        (iv) use digital tools to transform data in order to discuss and make inferences

(7) Data literacy, management, and representation--communicate and publish results. The student creates digital products to communicate data to an audience for an intended purpose. The student is expected to use digital tools to communicate and display data from a product or process to inform an intended audience.

    (A) use digital tools to communicate and display data from a product or process to inform an intended audience.

        (i) use digital tools to communicate data from a product or process to inform an intended audience

        (ii) use digital tools to display data from a product or process to inform an intended audience

(8) Digital citizenship--social interactions. The student understands different styles of digital communication and that a student's actions online can have a long-term impact. The student is expected to:

    (A) identify the impact of a digital footprint;

        (i) identify the impact of a digital footprint

    (B) create formal and informal digital communications using appropriate digital etiquette; and

        (i) create formal digital communications using appropriate digital etiquette

        (ii) create informal digital communications using appropriate digital etiquette

    (C) collaborate on digital platforms such as recording a video conference presentation using appropriate formal and informal digital etiquette.

        (i) collaborate on digital platforms using appropriate formal digital etiquette

        (ii) collaborate on digital platforms using appropriate informal digital etiquette

(9) Digital citizenship--ethics and laws. The student recognizes and practices responsible, legal, and ethical behavior while using digital tools and resources. The student is expected to:

(A) adhere to local acceptable use policy (AUP) and practice safe, ethical, and positive online behaviors;

    (i) adhere to local acceptable use policy (AUP)

    (ii) practice safe online behaviors

    (iii) practice ethical online behaviors

    (iv) practice positive online behaviors

(B) discuss and define intellectual property and associated terms, including copyright law, permission, fair use, creative commons, open source, and public domain;

    (i) discuss intellectual property and associated terms, including copyright law

    (ii) discuss intellectual property and associated terms, including permission

    (iii) discuss intellectual property and associated terms, including fair use

    (iv) discuss intellectual property and associated terms, including creative commons

    (v) discuss intellectual property and associated terms, including open source

    (vi) discuss intellectual property and associated terms, including public domain

    (vii) define intellectual property and associated terms, including copyright law

    (viii) define intellectual property and associated terms, including permission

    (ix) define intellectual property and associated terms, including fair use

    (x) define intellectual property and associated terms, including creative commons

    (xi) define intellectual property and associated terms, including open source

    (xii) define intellectual property and associated terms, including public domain

(C) create citations and cite sources for a variety of digital forms of intellectual property; and

    (i) create citations for a variety of digital forms of intellectual property

    (ii) cite sources for a variety of digital forms of intellectual property

(D) describe how information can be exaggerated or misrepresented online.

    (i) describe how information can be exaggerated or misrepresented online

(10) Digital citizenship--privacy, safety, and security. The student practices safe, legal, and ethical digital behaviors to become a socially responsible digital citizen. The student is expected to:

(A) identify real-world cybersecurity problems such as phishing, malware, password attacks, identity theft, and hacking; and

    (i) identify real-world cybersecurity problems

(B) identify various methods of cyberbullying such as harassment, impersonation, and cyberstalking.

    (i) identify various methods of cyberbullying

(11) Practical technology concepts--processes. The student evaluates and selects appropriate methods or techniques for an independent project and identifies and solves common hardware and software problems using troubleshooting strategies. The student is expected to create and design files in various formats such as text, graphics, video, and audio files.

(A) create and design files in various formats such as text, graphics, video, and audio files.

    (i)   create files in various formats

    (ii)   design files in various formats

(12) Practical technology concepts--skills and tools. The student leverages technology systems, concepts, and operations to produce digital artifacts. The student is expected to:

(A) apply appropriate technology terminology such as cloud applications, input, output, and basic programming;

    (i)   apply appropriate technology terminology

(B) identify effective file management strategies such as file naming conventions, local and remote locations, backup, hierarchy, folder structure, file conversion, tags, and emerging digital organizational strategies;

    (i)   identify effective file management strategies

(C) select and use the appropriate platform and tools to complete a specific task or project;

    (i)   select the appropriate platform to complete a specific task or project

    (ii)   select the appropriate tools to complete a specific task or project

    (iii)   use the appropriate platform to complete a specific task or project

    (iv)   use the appropriate tools to complete a specific task or project

(D) demonstrate improvement in speed and accuracy as measured by words per minute when applying correct keyboarding techniques;

    (i)   demonstrate improvement in speed and accuracy as measured by words per minute when applying correct keyboarding techniques

(E) select and use appropriate shortcuts within applications;

    (i)   select appropriate shortcuts within applications

    (ii)   use appropriate shortcuts within applications

(F) use help sources to research application features and solve software issues;

    (i)   use help sources to research application features

    (ii)   use help sources to solve software issues

(G) identify types of local and remote data storage such as cloud architecture or local server; and

    (i)   identify types of local data storage

    (ii)   identify types of remote data storage

(H) use productivity tools found in spread sheet, word processing, and publication applications to create digital artifacts such as reports, graphs, and charts.

    (i)   use productivity tools found in spread sheet [applications] to create digital artifacts

    (ii)   use productivity tools found in word processing [applications] to create digital artifacts

    (iii)   use productivity tools found in publication applications to create digital artifacts