

# Technology Applications, Grade 8

Subject: Technology Applications

Grade: 08

Expectations: 38

Breakouts: 127

## (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 using pseudocode;
    - (i) decompose real-world problems into structured parts using pseudocode

- (B) analyze the patterns and sequences found in pseudocode and identify its variables;
    - (i) analyze the patterns and sequence found in pseudocode
    - (ii) identify its [pseudocode] variables
  - (C) practice abstraction by developing a generalized algorithm that can solve different types of problems;
    - (i) practice abstraction by developing a generalized algorithm that can solve different types of problems
  - (D) design a plan collaboratively using pseudocode to document a problem, possible solutions, and an expected timeline for the development of a coded solution;
    - (i) design a plan collaboratively using pseudocode to document a problem for the development of a coded solution
    - (ii) design a plan collaboratively using pseudocode to document possible solutions for the development of a coded solution
    - (iii) design a plan collaboratively using pseudocode to document an expected timeline for the development of a coded solution
  - (E) develop, compare, and improve algorithms for a specific task to solve a problem; and
    - (i) develop algorithms for a specific task to solve a problem
    - (ii) compare algorithms for a specific task to solve a problem
    - (iii) improve algorithms for a specific task to solve a problem
  - (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) construct named variables with multiple data types and perform operations on their values;
    - (i) construct named variables with multiple data types
    - (ii) perform operations on their [constructed named variables with multiple data types] values
  - (B) use a software design process to create text-based programs with nested loops that address different subproblems within a real-world context; and
    - (i) use a software design process to create text-based programs with nested loops that address different subproblems within a real-world context
  - (C) modify and implement previously written code to develop improved programs.
    - (i) modify previously written code to develop improved programs
    - (ii) implement previously written code to develop improved programs
- (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) demonstrate innovation in a design process using goal setting and personal character traits, including demonstrating calculated risk-taking and tolerance;
    - (i) demonstrate innovation in a design process using goal setting

- (ii) demonstrate innovation in a design process using personal character traits, including demonstrating calculated risk-taking
  - (iii) demonstrate innovation in a design process using personal character traits, including demonstrating tolerance
- (B) discuss and implement a design process that includes planning, selecting digital tools to develop, test, and evaluate design limitations, and refining a prototype or model; and
- (i) discuss a design process that includes planning a prototype or model
  - (ii) discuss a design process that includes selecting digital tools to develop a prototype or model
  - (iii) discuss a design process that includes selecting digital tools to test a prototype or model
  - (iv) discuss a design process that includes selecting digital tools to evaluate design limitations [on] a prototype or model
  - (v) discuss a design process that includes refining a prototype or model
  - (vi) implement a design process that includes planning a prototype or model
  - (vii) implement a design process that includes selecting digital tools to develop a prototype or model
  - (viii) implement a design process that includes selecting digital tools to test a prototype or model
  - (ix) implement a design process that includes selecting digital tools to evaluate design limitations [on] a prototype or model
  - (x) implement a design process that includes refining a prototype or model
- (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) evaluate how changes in technology throughout history have impacted various areas of study;
- (i) evaluate how changes in technology throughout history have impacted various areas of study
- (B) evaluate and predict how global trends impact the development of technology; and
- (i) evaluate how global trends impact the development of technology
  - (ii) predict 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) compare and contrast data types, including binary, integers, real numbers, Boolean data, and text-based representations; and
- (i) compare and contrast data types, including binary
  - (ii) compare and contrast data types, including integers
  - (iii) compare and contrast data types, including real numbers

- (iv) compare and contrast data types, including Boolean data
  - (v) compare and contrast data types, including text-based representations
- (B) apply appropriate search strategies, including keywords, Boolean operators, and limiters, to achieve a specified outcome that includes a variety of file formats.
- (i) apply appropriate search strategies, including keywords, to achieve a specified outcome that includes a variety of file formats
  - (ii) apply appropriate search strategies, including Boolean operators, to achieve a specified outcome that includes a variety of file formats
  - (iii) apply appropriate search strategies, including limiters, to achieve a specified outcome that includes a variety of file formats
- (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 in order to transform data, analyze trends, and predict possibilities and develop steps for the creation of an innovative process or product.
- (A) use digital tools in order to transform data, analyze trends, and predict possibilities and develop steps for the creation of an innovative process or product.
- (i) use digital tools in order to transform data for the creation of an innovative process or product
  - (ii) use digital tools in order to analyze trends for the creation of an innovative process or product
  - (iii) use digital tools in order to predict possibilities for the creation of an innovative process or product
  - (iv) use digital tools in order to develop steps for the creation of an innovative process or product
- (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 publish data from a product or process to persuade an intended audience.
- (A) use digital tools to communicate and publish data from a product or process to persuade an intended audience.
- (i) use digital tools to communicate data from a product or process to persuade an intended audience
  - (ii) use digital tools to publish data from a product or process to persuade 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) analyze the importance of managing a digital footprint and how a digital footprint can affect the future;
- (i) analyze the importance of managing a digital footprint
  - (ii) analyze how a digital footprint can affect the future
- (B) create and publish a formal digital communication for a global audience using appropriate digital etiquette; and
- (i) create a formal digital communication for a global audience using appropriate digital etiquette
  - (ii) publish a formal digital communication for a global audience using appropriate digital etiquette
- (C) collaborate and publish for a global audience on digital platforms such as recording and editing videos using appropriate formal and informal digital etiquette.
- (i) collaborate for a global audience on digital platforms using appropriate formal digital etiquette
  - (ii) collaborate for a global audience on digital platforms using appropriate informal digital etiquette

- (iii) publish for a global audience on digital platforms using appropriate formal digital etiquette
  - (iv) publish for a global audience 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 and advocate for 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
    - (v) advocate for safe online behaviors
    - (vi) advocate for ethical online behaviors
    - (vii) advocate for positive online behaviors
  - (B) adhere to appropriate intellectual property law when creating digital products;
    - (i) adhere to appropriate intellectual property law when creating digital products
  - (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) evaluate the bias of digital information sources, including websites.
    - (i) evaluate the bias of digital information sources, including websites
- (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) analyze real-world scenarios to identify cybersecurity threats and propose ways to prevent harm; and
    - (i) analyze real-world scenarios to identify cybersecurity threats
    - (ii) analyze real-world scenarios to propose ways to prevent harm
  - (B) evaluate scenarios or case studies to identify warning signs of a cyberbullying victim such as withdrawal or lack of sleep and predict the outcomes for both the victim and the bully.
    - (i) evaluate scenarios or case studies to identify warning signs of a cyberbullying victim
    - (ii) evaluate scenarios or case studies to predict the outcomes for the victim
    - (iii) evaluate scenarios or case studies to predict the outcomes for the bully
- (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:
- (A) combine various file formats for a specific project or audience; and
    - (i) combine various file formats for a specific project or audience

(B) share and seek feedback on files in various formats, including text, raster and vector graphics, video, and audio files.

- (i) share feedback on files in various formats, including text
- (ii) share feedback on files in various formats, including raster and vector graphics
- (iii) share feedback on files in various formats, including video
- (iv) share feedback on files in various formats, audio files
- (v) seek feedback on files in various formats, including text
- (vi) seek feedback on files in various formats, including raster and vector graphics
- (vii) seek feedback on files in various formats, including video
- (viii) seek feedback on files in various formats, audio files

(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) integrate use of appropriate technology terminology in scholarly inquiry and dialogue such as classroom discussion and written samples;

- (i) integrate use of appropriate technology terminology in scholarly inquiry
- (ii) integrate use of appropriate technology terminology in dialogue

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

- (i) implement effective file management strategies independently, including file naming conventions
- (ii) implement effective file management strategies independently, including local locations
- (iii) implement effective file management strategies independently, including remote locations
- (iv) implement effective file management strategies independently, including backup
- (v) implement effective file management strategies independently, including hierarchy
- (vi) implement effective file management strategies independently, including folder structure
- (vii) implement effective file management strategies independently, including file conversion
- (viii) implement effective file management strategies independently, including tags
- (ix) implement effective file management strategies independently, including emerging digital organizational strategies

(C) select and use appropriate platform and tools, including selecting and using software or hardware to transfer data;

- (i) select appropriate platform, including selecting software or hardware to transfer data
- (ii) select appropriate tools, including selecting software or hardware to transfer data
- (iii) select appropriate platform, including using software or hardware to transfer data
- (iv) select appropriate tools, including using software or hardware to transfer data
- (v) use appropriate platform, including selecting software or hardware to transfer data

- (vi) use appropriate tools, including selecting software or hardware to transfer data
  - (vii) use appropriate platform, including using software or hardware to transfer data
  - (viii) use appropriate tools, including using software or hardware to transfer data
- (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) apply appropriate troubleshooting techniques and seek technical assistance as needed;
- (i) apply appropriate troubleshooting techniques
  - (ii) seek technical assistance as needed
- (G) compare types of local and remote data storage such as cloud architecture or local server and select the appropriate type of storage to store and share data; and
- (i) compare types of local data storage
  - (ii) compare types of remote data storage
  - (iii) select the appropriate type of storage to store data
  - (iv) select the appropriate type of storage to share data
- (H) select and use productivity tools found in spread sheet, word processing, and publication applications to create digital artifacts, including reports, graphs, and charts, with increasing complexity.
- (i) select productivity tools found in spread sheet [applications] to create digital artifacts, including reports with increasing complexity
  - (ii) select productivity tools found in word processing [applications] to create digital artifacts, including reports with increasing complexity
  - (iii) select productivity tools found in publication applications to create digital artifacts, including reports, with increasing complexity
  - (iv) select productivity tools found in spread sheet [applications] to create digital artifacts, including graphs with increasing complexity
  - (v) select productivity tools found in word processing [applications] to create digital artifacts, including graphs with increasing complexity
  - (vi) select productivity tools found in publication applications to create digital artifacts, including graphs, with increasing complexity
  - (vii) select productivity tools found in [spread sheet] applications to create digital artifacts, including charts with increasing complexity
  - (viii) select productivity tools found in word processing [applications] to create digital artifacts, including charts with increasing complexity

- (ix) select productivity tools found in publication applications to create digital artifacts, including charts, with increasing complexity
- (x) use productivity tools found in spread sheet [applications] to create digital artifacts, including reports with increasing complexity
- (xi) use productivity tools found in word processing [applications] to create digital artifacts, including reports with increasing complexity
- (xii) use productivity tools found in publication applications to create digital artifacts, including reports, with increasing complexity
- (xiii) use productivity tools found in spread sheet [applications] to create digital artifacts, including graphs with increasing complexity
- (xiv) use productivity tools found in word processing [applications] to create digital artifacts, including graphs with increasing complexity
- (xv) use productivity tools found in publication applications to create digital artifacts, including graphs, with increasing complexity
- (xvi) use productivity tools found in spread sheet [applications] to create digital artifacts, including charts with increasing complexity
- (xvii) use productivity tools found in word processing [applications] to create digital artifacts, including charts with increasing complexity
- (xviii) use productivity tools found in publication applications to create digital artifacts, including charts, with increasing complexity