

# Technology Applications, Grade 7

Subject: Technology Applications

Grade: 07

Expectations: 36

Breakouts: 97

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

- (B) analyze the patterns and sequences found in flowcharts;
    - (i) analyze the patterns found in flowcharts
    - (ii) analyze the sequences found in flowcharts
  - (C) identify abstraction and analyze how an algorithm the student created can be generalized to solve additional problems;
    - (i) identify abstraction
    - (ii) analyze how an algorithm the student created can be generalized to solve additional problems
  - (D) design a plan collaboratively using flowcharts to document a problem, possible solutions, and an expected timeline for the development of a coded solution;
    - (i) design a plan collaboratively using flowcharts to document a problem for the development of a coded solution
    - (ii) design a plan collaboratively using flowcharts to document possible solutions for the development of a coded solution
    - (iii) design a plan collaboratively using flowcharts 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) manipulate and rename variables and describe different data types; and
    - (i) manipulate variables
    - (ii) rename variables
    - (iii) describe different data types
  - (B) use a software design process to create text-based programs with nested loops that address different subproblems within a real-world context.
    - (i) use a software design process to create text-based programs with nested loops that address different subproblems within a real-world context
- (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 responsibility and advocating for self appropriately;
    - (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 that includes planning and selecting digital tools to develop and refine a prototype or model through trial and error; and
  - (i) discuss a design process that includes planning digital tools to develop a prototype or model through trial and error
  - (ii) discuss a design process that includes selecting digital tools to develop a prototype or model through trial and error
  - (iii) discuss a design process that includes planning digital tools to refine a prototype or model through trial and error
  - (iv) discuss a design process that includes selecting digital tools to refine a prototype or model through trial and error
  - (v) implement a design process that includes planning digital tools to develop a prototype or model through trial and error
  - (vi) implement a design process that includes selecting digital tools to develop a prototype or model through trial and error
  - (vii) implement a design process that includes planning digital tools to refine a prototype or model through trial and error
  - (viii) implement a design process that includes selecting digital tools to refine a prototype or model through trial and error
- (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) explain how changes in technology throughout history have impacted various areas of study;
    - (i) explain how changes in technology throughout history have impacted various areas of study
  - (B) explain how global trends impact the development of technology; and
    - (i) explain 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 a binary number system; and
    - (i) demonstrate how data can be represented in a binary number system
  - (B) evaluate advanced search strategies, including keywords, Boolean operators, and limiters.
    - (i) evaluate advanced search strategies, including keywords
    - (ii) evaluate advanced search strategies, including Boolean operators
    - (iii) evaluate advanced 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 in order to transform data to analyze trends and make inferences and predictions.
- (A) use digital tools in order to transform data to analyze trends and make inferences and predictions.
    - (i) use digital tools in order to transform data to analyze trends
    - (ii) use digital tools in order to transform data to make inferences
    - (iii) use digital tools in order to transform data to make predictions
- (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 or persuade an intended audience.
- (A) use digital tools to communicate and display data from a product or process to inform or persuade an intended audience.
    - (i) use digital tools to communicate data from a product or process to inform or persuade an intended audience
    - (ii) use digital tools to display data from a product or process to inform or 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) classify actions as having a positive or negative effect on a digital footprint;
    - (i) classify actions as having a positive or negative effect on a digital footprint
  - (B) create and revise formal and informal communications using a feedback process and appropriate digital etiquette; and
    - (i) create formal communications using a feedback process
    - (ii) create formal communications using appropriate digital etiquette
    - (iii) create informal communications using a feedback process
    - (iv) create informal communications using appropriate digital etiquette
    - (v) revise formal communications using a feedback process
    - (vi) revise formal communications using appropriate digital etiquette
    - (vii) revise informal communications using a feedback process
    - (viii) revise informal 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 and model 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) model safe online behaviors
- (vi) model ethical online behaviors
- (vii) model positive online behaviors

(B) explain the importance of intellectual property laws, including the benefits of protection for content owners, and the consequences of violating these laws;

- (i) explain the importance of intellectual property laws, including the benefits of protection for content owners
- (ii) explain the importance of intellectual property laws, including the consequences of violating these laws

(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 how various types of media, including social media, and technology can be used to exaggerate and misrepresent information.

- (i) evaluate how various types of media, including social media, can be used to exaggerate information
- (ii) evaluate how various types of media, including social media, can be used to misrepresent information
- (iii) evaluate how technology can be used to exaggerate information
- (iv) evaluate how technology can be used to misrepresent information

(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) describe and model ways to protect oneself from real-world cybersecurity attacks; and

- (i) describe ways to protect oneself from real-world cybersecurity attacks
- (ii) model ways to protect oneself from real-world cybersecurity attacks

(B) analyze the negative impacts of cyberbullying on the victim and the bully.

- (i) analyze the negative impacts of cyberbullying on the victim
- (ii) analyze the negative impacts of cyberbullying on 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 choose a variety of digital tools to create, share, and communicate digital artifacts.

(A) choose a variety of digital tools to create, share, and communicate digital artifacts.

- (i) choose a variety of digital tools to create digital artifacts
- (ii) choose a variety of digital tools to share digital artifacts
- (iii) choose a variety of digital tools to communicate digital artifacts

- (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) demonstrate proficiency in the appropriate use of technology terminology in projects through team collaboration and communication;
    - (i) demonstrate proficiency in the appropriate use of technology terminology in projects through team collaboration
    - (ii) demonstrate proficiency in the appropriate use of technology terminology in projects through team communication
  - (B) demonstrate 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 with assistance;
    - (i) demonstrate effective file management strategies with assistance
  - (C) select and use appropriate platform and tools, including selecting and using software or hardware for a defined task;
    - (i) select appropriate platform, including selecting software or hardware for a defined task
    - (ii) select appropriate tools, including selecting software or hardware for a defined task
    - (iii) select appropriate platform, including using software or hardware for a defined task
    - (iv) select appropriate tools, including using software or hardware for a defined task
    - (v) use appropriate platform, including selecting software or hardware for a defined task
    - (vi) use appropriate tools, including selecting software or hardware for a defined task
    - (vii) use appropriate platform, including using software or hardware for a defined task
    - (viii) use appropriate tools, including using software or hardware for a defined task
  - (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) research and test potential solutions to solve hardware and software problems;
    - (i) research potential solutions to solve hardware problems
    - (ii) research potential solutions to solve software problems
    - (iii) test potential solutions to solve hardware problems
    - (iv) test potential solutions to solve software problems
  - (G) use a variety of types of local and remote data storage to store or share data such as cloud architecture or local server; and
    - (i) use a variety of types of local data storage to store or share data

- (ii) use a variety of types of remote data storage to store or share data
- (H) select and use productivity tools found in spread sheet, word processing, and publication applications to create digital artifacts such as reports, graphs, and charts with increasing complexity.
- (i) select productivity tools found in spread sheet [applications] to create digital artifacts with increasing complexity
  - (ii) select productivity tools found in word processing [applications] to create digital artifacts with increasing complexity
  - (iii) select productivity tools found in publication applications to create digital artifacts with increasing complexity
  - (iv) use productivity tools found in spread sheet [applications] to create digital artifacts with increasing complexity
  - (v) use productivity tools found in word processing [applications] to create digital artifacts with increasing complexity
  - (vi) use productivity tools found in publication applications to create digital artifacts with increasing complexity