

Guidelines for Content Advisor Feedback on the K-8 Technology Applications Texas Essential Knowledge and Skills

Please review the current Texas Essential Knowledge and Skills (TEKS) for kindergarten–grade 8 technology applications and results from the K-8 technology applications TEKS survey. Use the following questions to develop feedback for the State Board of Education regarding revisions to the TEKS.

There is no specific format required for your feedback. When referencing specific portions of the TEKS, please indicate the grade level and the specific letter/number of the standard to which you are referring, as appropriate, e.g., 2.4.A (Grade 2, knowledge and skills statement (2), student expectation (A)).

GUIDING QUESTIONS

1. Is the current structure or framework of the kindergarten–grade 8 technology applications TEKS appropriate? If not, what recommendations do you have for organizing or structuring the revised TEKS?
 - I like the current structure of the TEKS, the standards as an overarching idea tying the concept together, followed by the student expectations, however, there were quite a few recommendations from the survey to break up in to grade level rather than grade bands, I think breaking it up would not be a bad idea
 - Keeping it in line with how the other subject areas are set up will lesson confusion allow for better implementation of the changes
 - Arlington ISD has a Curriculum Scope and Sequence for when Tech Apps are Introduced, practiced, mastered, or reviewed.
<https://drive.google.com/file/d/10EuKsq3C5pch1KD5DuaRqGylo8n8LcMb/view>
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2. Does each grade band and/or grade level follow a complete and logical development of technology application concepts presented within the grade band/level? If not, what improvements are needed?
 - Revise current 6 standards to the updated 7 standards used by ISTE
 - 7 strands based on the updated ISTE standards: Empowered Learner, Digital Citizen, Knowledge Constructor, Innovative Designer, Computational Thinker, Creative Communicator, and Global Collaborator
3. Are there specific topics that are missing from the current TEKS? If so, please explain.
 - Please see the comments attached to the TEKS outlined below.
 - Rearranging the strands by the new updated ISTE standards will realign some of the Student Expectations, align the language to match the CSTA language for the computational skills associated and embedded into the strands.

4. Are there topics that should be eliminated or revised because they are not essential or no longer reflect current research or practices within the field? If so, please identify by grade level and student expectation number.
- Please see the comments attached to the TEKS outlined below. I have correlated the new standards to where they appear in the current TEKS for K-2 to show the pattern, and be able to show we are hitting the standards I am referencing, but they have some movement and could be more explicit in some cases. Especially moving from the technology operations and concepts into Knowledge Constructor, Innovative Designer, and the CSTA Standards 1A- DA-06, 07; 1A –AP -08. 09. 10, 14, 15; P7.1, P4.4, P4. 1. P5.2 as referenced below in TEKS 3, 4, and 6, and adding Empowered learner

5. Are the TEKS vertically aligned so that concepts are introduced, elaborated on, and refined across grade bands/grade levels and students will possess the necessary knowledge and skills to be successful in later grades?

They are fairly vertically aligned, I have made notations below to denote some of the types of changes I see a need to align based on the new standards. Embed the CSTA standards within the framework of the application (strands/ ISTE Standards) this will update the expectations aligned to current research and expectations nationally.

In the comments, I went through the K-2 standards in ISTE and CSTA and marked/ highlighted. I have listed the standard either from ISTE or CSTA related to for reference, I believe we hit all of the standards, but there are few examples that were not explicit especially the CSTA Standards 1A- DA-06, 07; 1A –AP -08. 09. 10, 14, 15; P7.1, P4.4, P4. 1. P5.2 as referenced below in TEKS 3, 4, and 6.

6. Are the student expectations clear and specific? If not, please give examples of how the language might be improved.
- The next resource, I am going to recommend can relate to the SE's as Content Connectors, these are Washington State's versions of these, but I do like the concept. Examples start on page 9
 - <https://www.k12.wa.us/student-success/resources-subject-area/educational-technology-edtech/2018-educational-technology-standards>
 - Align the strands, and embed the CSTA within the scope of the ISTE standards

7. Do you have any additional direction based on the survey results? If so, please explain.
8. What other suggestions do you have for ways in which the technology applications TEKS can be improved?

Answer for 7 and 8 below

- Could we reimagine these TEKS as we have the ELPS standards?
 - There was a number of concerns about the lack of use of the TECH APPS
 - Namely time and access were a concern – connecting standards as we have with the ELPS could make this more available depending on the school system employing the TEKS.
 - Not having them embedded or integrated into the content areas

- Or seen as a course or standalone, so if you do not have this program, it does not relate, or seem important, when other items are required, or tested.
- There were also some indication that there is a disconnect between those who see tech apps as a way to teach and improve learning outcomes, more of learning strategies to engage and enhance learning, and those who see it as a fundamental set of skills attained to better equip them for Computer Science/ CTE type courses they may encounter in upper grades, or in the real world college/career.
- Next looking at the CSTA -CS Standards and seeing how they align to what we have written, since I am not finding anything related to NET(S), except older research
 - <https://www.csteachers.org/page/standards>

Chapter 126. Texas Essential Knowledge and Skills for Technology Applications

Subchapter A. Elementary

Statutory Authority: The provisions of this Subchapter A issued under the Texas Education Code, §7.102(c)(4) and §28.002, unless otherwise noted.

§126.5. Implementation of Texas Essential Knowledge and Skills for Technology Applications, Elementary, Beginning with School Year 2012-2013.


The provisions of §126.6 and §126.7 of this subchapter shall be implemented by school districts beginning with the 2012-2013 school year.

Source: The provisions of this §126.5 adopted to be effective September 26, 2011, 36 TexReg 6263.

§126.6. Technology Applications, Kindergarten-Grade 2, Beginning with School Year 2012-2013.

(a) **Introduction.**

- (1) The technology applications curriculum has six strands based on the National Educational Technology Standards for Students (NETS•S) and performance indicators developed by the International Society for Technology in Education (ISTE): creativity and innovation; communication and collaboration; research and information fluency; critical thinking, problem solving, and decision making; digital citizenship; and technology operations and concepts.
- (2) Through the study of the six strands in technology applications, students use creative thinking and innovative processes to construct knowledge and develop products. Students communicate and collaborate both locally and globally to reinforce and promote learning. Research and information fluency includes the acquisition and evaluation of digital content. Students develop critical-thinking, problem-solving, and decision-making skills by collecting, analyzing, and reporting digital information. Students practice digital citizenship by behaving responsibly while using technology tools and resources. Through the study of technology operations and concepts, students learn technology related terms, concepts, and data input strategies.

 Number: 1 Author: Casey Phelps Date: 7/9/2021 11:35:00 AM

7 strands based on the updated ISTE standards: Empowered learner, Digital Citizen, Knowledge Constructor, Innovative Designer, Computational Thinker, Creative Communicator, and Global Collaborator, weave in the CSTA standards as well. Computing Systems, Networks and the Internet, Data and Analysis, Algorithms and Programming

- (3) Statements that contain 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.
- (c) Creativity and innovation. The student uses creative thinking and innovative processes to construct knowledge and develop digital products. The student is expected to:
- (A) apply prior knowledge to develop new ideas, products, and processes;
 - (B) create original products using a variety of resources;
 - (C) explore virtual environments, simulations, models, and programming languages to enhance learning;
 - (D) create and execute steps to accomplish a task; and
 - (E) evaluate and modify steps to accomplish a task.
- (2) Communication and collaboration. The student collaborates and communicates both locally and globally using digital tools and resources to reinforce and promote learning. The student is expected to:
- (A) use communication tools that allow for anytime, anywhere access to interact, collaborate, or publish with peers locally and globally; participate in digital environments to develop cultural understanding by interacting with learners of multiple cultures;
 - (B) format digital information, including font attributes, color, white space, graphics, and animation, for a defined audience and communication medium; and
 - (C) select, store, and deliver products using a variety of media, formats, devices, and virtual environments.

Content Connection: K ELAR 1D work collaboratively with others by following agreed-upon rules for discussion, including taking turns; and

- (3) Research and information fluency. The student acquires and evaluates digital content. The student is expected to:
- (A) use search strategies to access information to guide inquiry;
 - (B) use research skills to build a knowledge base regarding a topic, task, or assignment; and
 - (C) evaluate the usefulness of acquired digital content.

Content Connections: K ELAR 3(A) use a resource such as a picture dictionary or digital resource to find words;

K ELAR 3(B) use illustrations and texts the student is able to read or hear to learn or clarify word meanings; and

K ELAR 12 C gather information from a variety of sources with adult assistance;

K ELAR 12 E use an appropriate mode of delivery, whether written, oral, or multimodal, to present results.

- (4) Critical thinking, problem solving, and decision making. The student applies critical-thinking skills to solve problems, guide research, and evaluate projects using digital tools and resources. The student is expected to:
- (A) identify what is known and unknown and what needs to be known regarding a problem and explain the steps to solve the problem;
 - (B) evaluate the appropriateness of a digital tool to achieve the desired product;
 - (C) evaluate products prior to final submission; and
 - (D) collect, analyze, and represent data using tools such as word processing, spreadsheets, graphic organizers, charts, multimedia, simulations, models, and programming languages.
- (5) Digital citizenship. The student practices safe, responsible, legal, and ethical behavior while using digital tools and resources. The student is expected to:
- (A) adhere to acceptable use policies reflecting appropriate behavior in a digital environment;

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- Number: 1 Author: Casey Phelps Date: 7/9/2021 11:05:00 AM
Creative Communicator: Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.
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- Number: 2 Author: Casey Phelps Date: 7/9/2021 9:47:00 AM
ISTE Standard 6b. Students create original works or responsibly repurpose or remix digital resources into new creations.
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- Number: 3 Author: Casey Phelps Date: 7/9/2021 10:46:00 AM
1A-AP-11 Decompose (break down) the steps needed to solve a problem into a precise sequence of instructions. (P3.2)
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- Number: 4 Author: Casey Phelps Date: 7/9/2021 10:46:00 AM
1A-AP-12 Develop plans that describe a program's sequence of events, goals, and expected outcomes. (P5.1, P7.2)
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- Number: 5 Author: Casey Phelps Date: 7/5/2021 6:12:00 PM
Global Collaborator: Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally
7a. Students use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning.
7b. Students use collaborative technologies to work with others, including peers, experts or community members, to examine issues and problems from multiple viewpoints.
7c. Students contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.
7d. Students explore local and global issues and use collaborative technologies to work with others to investigate solutions.
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- Number: 6 Author: Casey Phelps Date: 7/9/2021 10:47:00 AM
1A-IC-17 Work respectfully and responsibly with others online. (P2.1)
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- Number: 7 Author: Casey Phelps Date: 7/9/2021 11:13:00 AM
ISTE Standard 6c. Students communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.
ISTE Standard 6d. Students publish or present content that customizes the message and medium for their intended audiences.
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- Number: 8 Author: Casey Phelps Date: 7/9/2021 10:50:00 AM
Knowledge Constructor
Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.
3a. Students plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.
3b. Students evaluate the accuracy, perspective, credibility and relevance of information, media, data or other resources.
3c. Students curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.
3d. Students build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.
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- Number: 9 Author: Casey Phelps Date: 7/9/2021 11:29:00 AM
Innovative Designer
Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.
4a. Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
4b. Students select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.
4c. Students develop, test and refine prototypes as part of a cyclical design process.
4d. Students exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.
Computational Thinker
Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.
5a. Students formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.
5b. Students collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.
5c. Students break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.
5d. Students understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.
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- Number: 10 Author: Casey Phelps Date: 7/9/2021 10:00:00 AM
ISTE Standard 6a. Students choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.
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- Number: 11 Author: Casey Phelps Date: 7/9/2021 11:30:00 AM
1A- DA-06, 07; 1A -AP -08. 09. 10, 14, 15; P7.1, P4.4, P4. 1. P5.2
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- Number: 12 Author: Casey Phelps Date: 7/5/2021 6:08:00 PM
Digital Citizen: Students recognize the rights, responsibilities and opportunities of living, learning and working in an interconnected digital world, and they act and model in ways that are safe, legal and ethical.
2a. Students cultivate and manage their digital identity and reputation and are aware of the permanence of their actions in the digital world.
2b. Students engage in positive, safe, legal and ethical behavior when using technology, including social interactions online or when using networked devices.
2c. Students demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.
2d. Students manage their personal data to maintain digital privacy and security and are aware of data-collection technology used to track their navigation online.

- (B) comply with acceptable digital safety rules, fair use guidelines, and copyright laws; and
- (C) practice the responsible use of digital information regarding intellectual property, including software, text, images, audio, and video.

Reference from notation to add Content Connections example/ ideation to consider:

~~(#) Digital citizenship. The student practices safe, responsible, legal, and ethical behavior while using digital tools and resources.~~ Digital Citizen - Students recognize the rights, responsibilities and opportunities of living, learning and working in an interconnected digital world, and they act and model in ways that are safe, legal and ethical. The student is expected to:

- (A) adhere to acceptable use policies reflecting appropriate behavior in a digital environment;

Samples of student performance (by the end of grade 2):

- Students identify both positive and negative impacts technology can have on them.
- Students explain how information shared online leaves a digital footprint or “trail.”
- Students can explain the difference between information that is likely safe and appropriate to share online, and information that should be kept private.

- (B) comply with acceptable digital safety rules, fair use guidelines, and copyright laws; and

Samples of student performance (by the end of grade 2):

- Students can explain why they shouldn’t enter their personal information into a website, online game system, etc. without adult supervision.
- Explain what passwords are and why we use them, and use strong passwords to protect devices and information from unauthorized access.

- (C) practice the responsible use of digital information regarding intellectual property, including software, text, images, audio, and video.

Samples of student performance (by the end of grade 2):

- Students understand and can articulate the importance of respecting others’ belongings as they apply to digital content and information.
- Students understand that some digital content may be created by a company and not a single person.

- (1) Technology operations and concepts. The student demonstrates knowledge and appropriate use of technology systems, concepts, and operations. The student is expected to:

- (D) use appropriate terminology regarding basic hardware, software applications, programs, networking, virtual environments, and emerging technologies;

- (E) use appropriate digital tools and resources for storage, access, file management, collaboration, and designing solutions to problems;

- (F) perform basic software application functions, including opening an application and creating, modifying, printing, and saving files;

- (G) use a variety of input, output, and storage devices;

- (H) use proper keyboarding techniques such as ergonomically correct hand and body positions appropriate for Kindergarten-Grade 2 learning;

- Number: 1 Author: Casey Phelps Date: 7/9/2021 10:04:00 AM
1A-CS-02 Use appropriate terminology in identifying and describing the function of common physical components of computing systems (hardware). (P7.2)

- Number: 2 Author: Casey Phelps Date: 7/9/2021 10:06:00 AM
1A-DA-05 Store, copy, search, retrieve, modify, and delete information using a computing device and define the information stored as data. (P4.2)

- Number: 3 Author: Casey Phelps Date: 7/9/2021 10:01:00 AM
1A-CS-01 Select and Operate appropriate software to perform a variety of tasks, and recognize that users have different needs and preferences for the technology they use. (P1.1)
ISTE Standard Reference 6a. Students choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.

- Number: 4 Author: Casey Phelps Date: 7/9/2021 10:14:00 AM
1A-DA-05 Store, copy, search, retrieve, modify, and delete information using a computing device and define the information stored as data. (P4.2)

- Number: 5 Author: Casey Phelps Date: 7/9/2021 11:20:00 AM
1A-AP-13 Give attribution when using the ideas and creations of others while developing programs. (P7.3)
1A-IC-17 Work respectfully and responsibly with others online. (P2.1)
1A-IC-18 Keep login information private, and log off of devices appropriately. (P7.3)
1A-NI-04 Explain what passwords are and why we use them, and use strong passwords to protect devices and information from unauthorized access. (P7.3)

- (I) demonstrate keyboarding techniques for operating the alphabetic, numeric, punctuation, and symbol keys appropriate for Kindergarten-Grade 2 learning; and
- (J) use the help feature online and in applications.

Source: The provisions of this §126.6 adopted to be effective September 26, 2011, 36 TexReg 6263.

§126.7. Technology Applications, Grades 3-5, Beginning with School Year 2012-2013.

- (a) Introduction.
- (1) The technology applications curriculum has six strands based on the National Educational Technology Standards for Students (NETS•S) and performance indicators developed by the International Society for Technology in Education (ISTE): creativity and innovation; communication and collaboration; research and information fluency; critical thinking, problem solving, and decision making; digital citizenship; and technology operations and concepts.
 - (2) Through the study of the six strands in technology applications, students use creative thinking and innovative processes to construct knowledge and develop products. Students communicate and collaborate both locally and globally to reinforce and promote learning. Research and information fluency includes the acquisition and evaluation of digital content. Students develop critical-thinking, problem-solving, and decision-making skills by collecting, analyzing, and reporting digital information. Students practice digital citizenship by behaving responsibly while using technology tools and resources. Through the study of technology operations and concepts, students learn technology related terms, concepts, and data input strategies.
 - (3) Statements that contain 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.
- (1) Creativity and innovation. The student uses creative thinking and innovative processes to construct knowledge and develop digital products. The student is expected to:
 - (A) create original products using a variety of resources;
 - (B) analyze trends and forecast possibilities, developing steps for the creation of an innovative process or product; and
 - (C) use virtual environments to explore systems and issues.
 - (2) Communication and collaboration. The student collaborates and communicates both locally and globally using digital tools and resources to reinforce and promote learning. The student is expected to:
 - (A) draft, edit, and publish products in different media individually and collaboratively;
 - (B) use font attributes, color, white space, and graphics to ensure that products are appropriate for multiple communication media, including monitor display, web, and print;
 - (C) collaborate effectively through personal learning communities and social environments;
 - (D) select and use appropriate collaboration tools;
 - (E) evaluate the product for relevance to the assignment or task; and
 - (F) perform basic software application functions, including opening applications and creating, modifying, printing, and saving files.
 - (3) Research and information fluency. The student acquires and evaluates digital content. The student is expected to:
 - (A) use various search strategies such as keyword(s); the Boolean identifiers *and*, *or*, and *not*; and other strategies appropriate to specific search engines;
 - (B) collect and organize information from a variety of formats, including text, audio, video, and graphics;
 - (C) validate and evaluate the relevance and appropriateness of information; and
 - (D) acquire information appropriate to specific tasks.

Chapter 126. Texas Essential Knowledge and Skills for Technology Applications

Subchapter B. Middle School

Statutory Authority: The provisions of this Subchapter B issued under the Texas Education Code, §7.102(c)(4) and §28.002, unless otherwise noted.

§126.13. Implementation of Texas Essential Knowledge and Skills for Technology Applications, Middle School, Beginning with School Year 2012-2013.

The provisions of §§126.14-126.16 of this subchapter shall be implemented by school districts beginning with the 2012-2013 school year.

Source: The provisions of this §126.13 adopted to be effective September 26, 2011, 36 TexReg 6263.

§126.14. Technology Applications, Grade 6, Beginning with School Year 2012-2013.

- (a) General requirements. Districts have the flexibility of offering technology applications in a variety of settings. Districts are encouraged to offer technology applications in all content areas. This content may also be offered in a specific class while being integrated in all content areas.
- (b) Introduction.
 - (1) The technology applications curriculum has six strands based on the National Educational Technology Standards for Students (NETS•S) and performance indicators developed by the International Society for Technology in Education (ISTE): creativity and innovation; communication and collaboration; research and information fluency; critical thinking, problem solving, and decision making; digital citizenship; and technology operations and concepts.
 - (2) Through the study of technology applications, students make informed decisions by understanding current and emerging technologies, including technology systems, appropriate digital tools, and personal learning networks. As competent researchers and responsible digital citizens, students use creative and computational thinking to solve problems while developing career and college readiness skills.
 - (3) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.
- (c) Knowledge and skills.
 - (1) Creativity and innovation. The student uses creative thinking and innovative processes to construct knowledge, generate new ideas, and create products. The student is expected to:
 - (A) identify, create, and use files in various formats such as text, raster and vector graphics, video, and audio files;
 - (B) create original works as a means of personal or group expression;
 - (C) explore complex systems or issues using models, simulations, and new technologies to make predictions, modify input, and review results; and
 - (D) discuss trends and possible outcomes.
 - (2) Communication and collaboration. The student collaborates and communicates both locally and globally to reinforce and promote learning. The student is expected to:
 - (A) participate in personal learning networks to collaborate with peers, experts, or others using digital tools such as blogs, wikis, audio/video communication, or other emerging technologies;

- (B) communicate effectively with multiple audiences using a variety of media and formats; and
 - (C) read and discuss examples of technical writing.
- (3) Research and information fluency. The student acquires, analyzes, and manages content from digital resources. The student is expected to:
- (A) create a research plan to guide inquiry;
 - (B) discuss and use various search strategies, including keyword(s) and Boolean operators;
 - (C) select and evaluate various types of digital resources for accuracy and validity; and
 - (D) process data and communicate results.
- (4) Critical thinking, problem solving, and decision making. The student makes informed decisions by applying critical-thinking and problem-solving skills. The student is expected to:
- (A) identify and define relevant problems and significant questions for investigation;
 - (B) plan and manage activities to develop a solution, design a computer program, or complete a project;
 - (C) collect and analyze data to identify solutions and make informed decisions;
 - (D) use multiple processes and diverse perspectives to explore alternative solutions;
 - (E) make informed decisions and support reasoning; and
 - (F) transfer current knowledge to the learning of newly encountered technologies.
- (5) Digital citizenship. The student practices safe, responsible, legal, and ethical behavior while using technology tools and resources. The student is expected to:
- (A) understand copyright principles, including current laws, fair use guidelines, creative commons, open source, and public domain;
 - (B) practice ethical acquisition of information and standard methods for citing sources;
 - (C) practice safe and appropriate online behavior, personal security guidelines, digital identity, digital etiquette, and acceptable use of technology; and
 - (D) understand the negative impact of inappropriate technology use, including online bullying and harassment, hacking, intentional virus setting, invasion of privacy, and piracy such as software, music, video, and other media.
- (6) Technology operations and concepts. The student demonstrates a thorough understanding of technology concepts, systems, and operations. The student is expected to:
- (A) define and use current technology terminology appropriately;
 - (B) select technology tools based on licensing, application, and support;
 - (C) identify, understand, and use operating systems;
 - (D) understand and use software applications, including selecting and using software for a defined task;
 - (E) identify, understand, and use hardware systems;
 - (F) understand troubleshooting techniques such as restarting systems, checking power issues, resolving software compatibility, verifying network connectivity, connecting to remote resources, and modifying display properties;

- (G) demonstrate effective file management strategies such as file naming conventions, location, backup, hierarchy, folder structure, file conversion, tags, labels, and emerging digital organizational strategies;
- (H) discuss how changes in technology throughout history have impacted various areas of study;
- (I) discuss the relevance of technology as it applies to college and career readiness, life-long learning, and daily living;
- (J) use a variety of local and remote input sources;
- (K) use keyboarding techniques and ergonomic strategies while building speed and accuracy;
- (L) create and edit files with productivity tools, including:
 - (i) a word processing document using digital typography standards such as page layout, font formatting, paragraph formatting, and list attributes;
 - (ii) a spreadsheet workbook using basic computational and graphic components such as basic formulas and functions, data types, and chart generation;
 - (iii) a database by manipulating components such as entering and searching for relevant data; and
 - (iv) a digital publication using relevant publication standards;
- (M) plan and create non-linear media projects using graphic design principles; and
- (N) integrate two or more technology tools to create a new digital product.

Source: The provisions of this §126.14 adopted to be effective September 26, 2011, 36 TexReg 6263.

§126.15. Technology Applications, Grade 7, Beginning with School Year 2012-2013.

- (a) General requirements. Districts have the flexibility of offering technology applications in a variety of settings. Districts are encouraged to offer technology applications in all content areas. This content may also be offered in a specific class while being integrated in all content areas.
- (b) Introduction.
 - (1) The technology applications curriculum has six strands based on the National Educational Technology Standards for Students (NETS•S) and performance indicators developed by the International Society for Technology in Education (ISTE): creativity and innovation; communication and collaboration; research and information fluency; critical thinking, problem solving, and decision making; digital citizenship; and technology operations and concepts.
 - (2) Through the study of technology applications, students make informed decisions by understanding current and emerging technologies, including technology systems, appropriate digital tools, and personal learning networks. As competent researchers and responsible digital citizens, students use creative and computational thinking to solve problems while developing career and college readiness skills.
 - (3) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.
- (c) Knowledge and skills.
 - (1) Creativity and innovation. The student uses creative thinking and innovative processes to construct knowledge, generate new ideas, and create products. The student is expected to:
 - (A) identify, create, and use files in various formats such as text, raster and vector graphics, video, and audio files;
 - (B) create and present original works as a means of personal or group expression;

- (C) explore complex systems or issues using models, simulations, and new technologies to make predictions, modify input, and review results; and
 - (D) discuss trends and make predictions.
- (2) Communication and collaboration. The student collaborates and communicates both locally and globally to reinforce and promote learning. The student is expected to:
- (A) create personal learning networks to collaborate and publish with peers, experts, or others using digital tools such as blogs, wikis, audio/video communication, or other emerging technologies;
 - (B) communicate effectively with multiple audiences using a variety of media and formats; and
 - (C) create products using technical writing strategies.
- (3) Research and information fluency. The student acquires, analyzes, and manages content from digital resources. The student is expected to:
- (A) create a research plan to guide inquiry;
 - (B) use and evaluate various search strategies, including keyword(s) and Boolean operators;
 - (C) select and evaluate various types of digital resources for accuracy and validity; and
 - (D) process data and communicate results.
- (4) Critical thinking, problem solving, and decision making. The student makes informed decisions by applying critical-thinking and problem-solving skills. The student is expected to:
- (A) identify and define relevant problems and significant questions for investigation;
 - (B) plan and manage activities to develop a solution, design a computer program, or complete a project;
 - (C) collect and analyze data to identify solutions and make informed decisions;
 - (D) use multiple processes and diverse perspectives to explore alternative solutions;
 - (E) make informed decisions and support reasoning; and
 - (F) transfer current knowledge to the learning of newly encountered technologies.
- (5) Digital citizenship. The student practices safe, responsible, legal, and ethical behavior while using technology tools and resources. The student is expected to:
- (A) understand and practice copyright principles, including current laws, fair use guidelines, creative commons, open source, and public domain;
 - (B) practice ethical acquisition of information and standard methods for citing sources;
 - (C) practice and explain safe and appropriate online behavior, personal security guidelines, digital identity, digital etiquette, and acceptable use of technology; and
 - (D) understand the negative impact of inappropriate technology use, including online bullying and harassment, hacking, intentional virus setting, invasion of privacy, and piracy such as software, music, video, and other media.
- (6) Technology operations and concepts. The student demonstrates a thorough understanding of technology concepts, systems, and operations. The student is expected to:
- (A) define and use current technology terminology appropriately;
 - (B) select and apply technology tools based on licensing, application, and support;
 - (C) identify, understand, and use operating systems;

- (D) understand and use software applications, including selecting and using software for a defined task;
- (E) identify, understand, and use hardware systems;
- (F) understand troubleshooting techniques such as restarting systems, checking power issues, resolving software compatibility, verifying network connectivity, connecting to remote resources, and modifying display properties;
- (G) implement effective file management strategies such as file naming conventions, location, backup, hierarchy, folder structure, file conversion, tags, labels, and emerging digital organizational strategies;
- (H) explain how changes in technology throughout history have impacted various areas of study;
- (I) explain the relevance of technology as it applies to college and career readiness, life-long learning, and daily living;
- (J) use a variety of local and remote input sources;
- (K) use keyboarding techniques and ergonomic strategies while building speed and accuracy;
- (L) create and edit files with productivity tools, including:
 - (i) a word processing document using digital typography standards such as page layout, font formatting, paragraph formatting, and list attributes;
 - (ii) a spreadsheet workbook using advanced computational and graphic components such as complex formulas, basic functions, data types, and chart generation;
 - (iii) a database by manipulating components such as defining fields, entering data, and designing layouts appropriate for reporting; and
 - (iv) a digital publication using relevant publication standards;
- (M) plan and create non-linear media projects using graphic design principles; and
- (N) integrate two or more technology tools to create a new digital product.

Source: The provisions of this §126.15 adopted to be effective September 26, 2011, 36 TexReg 6263.

§126.16. Technology Applications, Grade 8, Beginning with School Year 2012-2013.

- (a) General requirements. Districts have the flexibility of offering technology applications in a variety of settings. Districts are encouraged to offer technology applications in all content areas. This content may also be offered in a specific class while being integrated in all content areas.
- (b) Introduction.
 - (1) The technology applications curriculum has six strands based on the National Educational Technology Standards for Students (NETS•S) and performance indicators developed by the International Society for Technology in Education (ISTE): creativity and innovation; communication and collaboration; research and information fluency; critical thinking, problem solving, and decision making; digital citizenship; and technology operations and concepts.
 - (2) Through the study of technology applications, students make informed decisions by understanding current and emerging technologies, including technology systems, appropriate digital tools, and personal learning networks. As competent researchers and responsible digital citizens, students use creative and computational thinking to solve problems while developing career and college readiness skills.
 - (3) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.
- (c) Knowledge and skills.

- (1) Creativity and innovation. The student uses creative thinking and innovative processes to construct knowledge, generate new ideas, and create products. The student is expected to:
 - (A) identify, create, and use files in various formats, including text, raster and vector graphics, video, and audio files;
 - (B) create, present, and publish original works as a means of personal or group expression;
 - (C) explore complex systems or issues using models, simulations, and new technologies to develop hypotheses, modify input, and analyze results; and
 - (D) analyze trends and forecast possibilities.
- (2) Communication and collaboration. The student collaborates and communicates both locally and globally to reinforce and promote learning. The student is expected to:
 - (A) create and manage personal learning networks to collaborate and publish with peers, experts, or others using digital tools such as blogs, wikis, audio/video communication, or other emerging technologies;
 - (B) communicate effectively with multiple audiences using a variety of media and formats; and
 - (C) create and publish products using technical writing strategies.
- (3) Research and information fluency. The student acquires, analyzes, and manages content from digital resources. The student is expected to:
 - (A) create a research plan to guide inquiry;
 - (B) plan, use, and evaluate various search strategies, including keyword(s) and Boolean operators;
 - (C) select and evaluate various types of digital resources for accuracy and validity; and
 - (D) process data and communicate results.
- (4) Critical thinking, problem solving, and decision making. The student makes informed decisions by applying critical-thinking and problem-solving skills. The student is expected to:
 - (A) identify and define relevant problems and significant questions for investigation;
 - (B) plan and manage activities to develop a solution, design a computer program, or complete a project;
 - (C) collect and analyze data to identify solutions and make informed decisions;
 - (D) use multiple processes and diverse perspectives to explore alternative solutions;
 - (E) make informed decisions and support reasoning; and
 - (F) transfer current knowledge to the learning of newly encountered technologies.
- (5) Digital citizenship. The student practices safe, responsible, legal, and ethical behavior while using technology tools and resources. The student is expected to:
 - (A) understand, explain, and practice copyright principles, including current laws, fair use guidelines, creative commons, open source, and public domain;
 - (B) practice and explain ethical acquisition of information and standard methods for citing sources;
 - (C) practice and explain safe and appropriate online behavior, personal security guidelines, digital identity, digital etiquette, and acceptable use of technology; and

- (D) understand and explain the negative impact of inappropriate technology use, including online bullying and harassment, hacking, intentional virus setting, invasion of privacy, and piracy such as software, music, video, and other media.
- (6) Technology operations and concepts. The student demonstrates a thorough understanding of technology concepts, systems, and operations. The student is expected to:
- (A) define and use current technology terminology appropriately;
 - (B) evaluate and select technology tools based on licensing, application, and support;
 - (C) identify, understand, and use operating systems;
 - (D) understand and use software applications, including selecting and using software for a defined task;
 - (E) identify, understand, and use hardware systems;
 - (F) apply troubleshooting techniques, including restarting systems, checking power issues, resolving software compatibility, verifying network connectivity, connecting to remote resources, and modifying display properties;
 - (G) implement effective file management strategies such as file naming conventions, location, backup, hierarchy, folder structure, file conversion, tags, labels, and emerging digital organizational strategies;
 - (H) evaluate how changes in technology throughout history have impacted various areas of study;
 - (I) evaluate the relevance of technology as it applies to college and career readiness, life-long learning, and daily living;
 - (J) use a variety of local and remote input sources;
 - (K) use keyboarding techniques and ergonomic strategies while building speed and accuracy;
 - (L) create and edit files with productivity tools, including:
 - (i) a word processing document using digital typography standards such as page layout, font formatting, paragraph formatting, mail merge, and list attributes;
 - (ii) a spreadsheet workbook using advanced computational and graphic components such as complex formulas, advanced functions, data types, and chart generation;
 - (iii) a database by manipulating components, including defining fields, entering data, and designing layouts appropriate for reporting; and
 - (iv) a digital publication using relevant publication standards and graphic design principles;
 - (M) plan and create non-linear media projects using graphic design principles; and
 - (N) integrate two or more technology tools to create a new digital product.

Source: The provisions of this §126.16 adopted to be effective September 26, 2011, 36 TexReg 6263.

- (4) Critical thinking, problem solving, and decision making. The student researches and evaluates projects using digital tools and resources. The student is expected to:
 - (A) identify information regarding a problem and explain the steps toward the solution;
 - (B) collect, analyze, and represent data to solve problems using tools such as word processing, databases, spreadsheets, graphic organizers, charts, multimedia, simulations, models, and programming languages;
 - (C) evaluate student-created products through self and peer review for relevance to the assignment or task; and
 - (D) evaluate technology tools applicable for solving problems.
- (5) Digital citizenship. The student practices safe, responsible, legal, and ethical behavior while using digital tools and resources. The student is expected to:
 - (A) adhere to acceptable use policies reflecting positive social behavior in the digital environment;
 - (B) respect the intellectual property of others;
 - (C) abide by copyright law and the Fair Use Guidelines for Educational Multimedia;
 - (D) protect and honor the individual privacy of oneself and others;
 - (E) follow the rules of digital etiquette;
 - (F) practice safe, legal, and responsible use of information and technology; and
 - (G) comply with fair use guidelines and digital safety rules.
- (6) Technology operations and concepts. The student demonstrates knowledge and appropriate use of technology systems, concepts, and operations. The student is expected to:
 - (A) demonstrate an understanding of technology concepts, including terminology for the use of operating systems, network systems, virtual systems, and learning systems appropriate for Grades 3-5 learning;
 - (B) manipulate files using appropriate naming conventions; file management, including folder structures and tagging; and file conversions;
 - (C) navigate systems and applications accessing peripherals both locally and remotely;
 - (D) troubleshoot minor technical problems with hardware and software using available resources such as online help and knowledge bases; and
 - (E) use proper touch keyboarding techniques and ergonomic strategies such as correct hand and body positions and smooth and rhythmic keystrokes.

Source: The provisions of this §126.7 adopted to be effective September 26, 2011, 36 TexReg 6263.