

Proposed Revisions

Texas Essential Knowledge and Skills

Technology Applications, High School

Prepared by the State Board of Education TEKS Review Committees

November 2010

These documents have been formatted for consistency and ease of review.

Proposed additions are shown in green font with underlines and proposed deletions are shown in red font with strikethroughs.

Comments in the margin provide explanations for proposed changes. The following notations were used as part of the explanations:

CRS—information added or changed to align with College Readiness Standards

ER—information added, changed, or deleted based on expert reviewer feedback

MV—multiple viewpoints from within the committee

VA—information added, changed, or deleted to increase vertical alignment

21st—information updated to 21st century technology trends, applications, and uses

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§126.24. Digital Design and Media Production ~~Desktop Publishing~~ (One Credit).

- (a) General requirements. The prerequisite for this course is proficiency in the knowledge and skills described in §126.12(c) of this title (relating to Technology Applications (Computer Literacy), Grades 6-8). This course is recommended for students in Grades 9-12.
- (b) Introduction.
 - (1) The technology applications curriculum has ~~four~~ six strands: ~~foundations, information acquisition, work in solving problems, and communication based on the National Educational Technology Standards (NETS•S) and Performance Indicators for Students 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 foundations, including technology related terms, concepts, and data input strategies, students learn to make informed decisions about technologies and their applications. The efficient acquisition of information includes the identification of task requirements; the plan for using search strategies; and the use of technology to access, analyze, and evaluate the acquired information. By using technology as a tool that supports the work of individuals and groups in solving problems, students will select the technology appropriate for the task, synthesize knowledge, create a solution, and evaluate the results. Students communicate information in different formats and to diverse audiences. A variety of technologies will be used. Students will analyze and evaluate the results.~~
 - (2) Through the study of digital design and media production, students will demonstrate creative thinking to develop innovative strategies and to use communication tools in order to work effectively with others as well as independently. Students will gather information electronically which will allow for problem solving and making informed decisions regarding media projects. Through this course, students will become better digital citizens and demonstrate a thorough understanding of digital design principles that is transferable to other disciplines.
- (c) Knowledge and skills.
 - ~~(1) Foundations. The student demonstrates knowledge and appropriate use of hardware components, software programs, and their connections. The student is expected to:~~
 - ~~(A) demonstrate knowledge and appropriate use of operating systems, software applications, and communication and networking components;~~
 - ~~(B) compare, contrast, and appropriately use the various input, processing, output, and primary/secondary storage devices;~~
 - ~~(C) make decisions regarding the selection, acquisition, and use of software taking under consideration its quality, appropriateness, effectiveness, and efficiency;~~

Comment [A1]: Justifications: The Desktop Publishing TEKS Review Committee collaborated to enhance the existing Desktop Publishing course to address more rigorous expectations. Also taken into consideration was the proposed state mandated eighth-grade proficiency test. With the belief that the students would be more consistently prepared, the committee wanted to move their education performance forward from that point allowing for vertical alignment.

The National Educational Technology Standards and Performance Indicators for students (NETS•S) published through the International Society for Technology Education (ISTE) were compared with the existing TEKS for Desktop Publishing course. It was decided by this committee to align the TEKS expectations for the existing Desktop Publishing to correlate with the ISTE standards. The ISTE strands for students who were used in the rewrite include creativity and innovation; communication and collaboration; research and information fluency; critical thinking, problem solving, and decision making; digital citizenship; and technology operations and concepts.

The Texas College and Career Readiness Cross Disciplinary Standards were also considered in the analysis of the existing Desktop Publishing TEKS. These main topics grouping the performance indicators are Key Cognitive Skills and Foundational Skills.

As a result of enhancing the Desktop Publishing course, the committee decided to rename the course Digital Design and Media Production to better represent the course requirements.

- ~~(D) delineate and make necessary adjustments regarding compatibility issues including, but not limited to, digital file formats and cross-platform connectivity; and~~
- ~~(E) demonstrate knowledge of technology terminology and concepts relating them to desktop publishing.~~

(1) Creativity and innovation. The student employs a creative design process to create original projects as they relate to purposes and audiences. The student is expected to:

- (A) create designs for defined projects such as graphics, logos, and page layouts;
- (B) apply design elements and typography standards; and
- (C) use visual composition principles.

Comment [A2]: MV-modified from original TEKS 10D, 10G and 10H , 10I, 10J and ISTE standards 1A and 1B

Comment [A3]: MV-modified from original TEKS 10D, 10G and 10H , 10I, 10J and ISTE standards 1A and 1B

~~(2) Foundations. The student uses data input skills appropriate to the task. The student is expected to:~~

- ~~(A) demonstrate proficiency in the use of a variety of input devices such as mouse, keyboard, disk/disc, modem, scanner, voice/sound recorder, or digital camera by appropriately incorporating such components into the product; and~~
- ~~(B) use digital keyboarding standards in word processing such as one space after punctuation, the use of em/en dashes, and smart quotation marks.~~

(2) Communication and collaboration. The student understands professional digital media communications strategies. The student is expected to:

- (A) adapt the language and design of a project for audience, purpose, situation and intent;
- (B) organize oral, written, and graphic information into formal and informal publications;
- (C) interpret and communicate information to multiple audiences; and
- (D) collaborate—including seeking and responding to advice from others, such as peers or experts, in the creation and evaluation process—to create original projects.

Comment [A4]: MV – modified from original TEKS 3C, 10A, 11A, 12A, 12C; ISTE standards 2B, 6B, CRS ID4, IIA3, IIB1 and B3, IIC6, IE2,

~~(3) Foundations. The student complies with the laws and examines the issues regarding the use of technology in society. The student is expected to:~~

- ~~(A) discuss copyright laws/issues and model ethical acquisition and use of digital information, citing sources using established methods;~~
- ~~(B) demonstrate proper etiquette and knowledge of acceptable use policies when using networks, especially resources on the Internet and intranet; and~~
- ~~(C) analyze the impact of desktop publishing on society including concepts related to persuasiveness, marketing, and point of view.~~

(3) Research and information fluency. The student uses a variety of strategies to plan, obtain, evaluate, and use valid information. The student is expected to:

- (A) obtain print and digital information from a variety of resources such as graphics, audio, and video while citing the source; and
- (B) evaluate information for accuracy and validity; and

Comment [A5]: MV-modified from original TEKS 3A and B; 4, 8A, 9; ISTE 3; CRS IIC1, IIC2, IIC3, IIC4, and IIC5, IIE1

- (C) present accurate information using techniques appropriate for the intended audience.
- ~~(4) Information acquisition. The student uses a variety of strategies to acquire information from electronic resources, with appropriate supervision. The student is expected to:
 - ~~(A) use strategies to obtain print and digital information from a variety of electronic resources including, but not limited to, reference software, databases, and libraries of images, citing the source; and~~
 - ~~(B) use strategies to navigate on and access information from local area networks (LANs), wide area networks (WANs), the Internet, and intranet.~~~~
- (4) Critical thinking, problem solving, and decision making. The student implements problem-solving methods using critical-thinking skills to plan, implement, manage, and evaluate projects; solve problems; and make informed decisions using appropriate digital tools and resources. The student is expected to:
 - (A) employ critical-thinking and interpersonal skills to solve problems and make decisions through planning and gathering, interpreting, and evaluating data;
 - (B) identify and organize the tasks for completion of a project using the most appropriate digital tools;
 - (C) distinguish design requirements as they relate to the purposes and audiences of a project and apply appropriate design elements;
 - (D) seek and respond to input from others, including peers, teachers, and outside collaborators;
 - (E) evaluate process and project both independently and collaboratively and make suggested revisions; and
 - (F) transfer critical-thinking, problem solving, and decision-making processes when utilizing new technologies.
- ~~(5) Information acquisition. The student acquires electronic information in a variety of formats, with appropriate supervision. The student is expected to:
 - ~~(A) acquire information in electronic formats including text, audio, video, and graphics, citing the source; and~~
 - ~~(B) demonstrate the ability to import and export elements from one program to another.~~~~
- (5) Digital citizenship. The student complies with standard practices and behaviors and upholds legal and ethical responsibilities. The student is expected to:
 - (A) examine copyright and fair use guidelines with regard to print and digital media;
 - (B) model ethical and legal acquisition and use of digital resources such as licensing and established methods of citing sources;
 - (C) demonstrate proper digital etiquette, personal security guidelines, use of network resources, and application of the district's acceptable use policy for technology; and

Comment [A6]: MV Modified from Original TEKS 7, 8E, 9; ISTE 4; CRS IC1 and IC2

Comment [A7]: MV Modified from Original TEKS 3A, 3B; ISTE 5; CRS IE2; 21st

- (D) identify and demonstrate positive personal qualities such as flexibility, open-mindedness, initiative, listening attentively to speakers, willingness to learn new knowledge and skills, and pride in quality work.
- ~~(6) Information acquisition. The student evaluates the acquired electronic information. The student is expected to:~~
 - ~~(A) identify and employ a method to evaluate the information; and~~
 - ~~(B) demonstrate skill in testing the accuracy and validity of the information.~~
- (6) Technology operations and concepts. The student will use technology concepts, systems, and operations as appropriate for the project. The student is expected to:
 - (A) define the purpose of the product and identify the specified audience;
 - (B) demonstrate appropriate project management to:
 - (i) create a plan for a media project such as a storyboard, stage development, and identification of equipment and resources; and
 - (ii) evaluate the project for design, content delivery, purpose, and audience along its timeline and make suggested revisions until completion of the project.
 - (C) use hardware, software, and information appropriate to the project and its audience to:
 - (i) acquire readily available digital information, including text, audio, video, and graphics, citing the sources;
 - (ii) create digital content through the use of various devices such as video camera, digital camera, scanner, microphone, interactive whiteboards, video capture, and musical instruments;
 - (iii) collaborate via online tools such as blogs, discussion boards, e-mail, and online learning communities;
 - (iv) make decisions regarding the selection and use of software, taking into consideration operating system platform, quality, appropriateness, effectiveness, and efficiency;
 - (v) delineate and make necessary adjustments regarding compatibility issues, including digital file formats and cross-platform connectivity; and
 - (vi) demonstrate the ability to import and export elements from one program to another.
 - (D) use digital typography standards such as
 - (i) one space after punctuation, the use of em- and en-dashes, and smart quotation marks;
 - (ii) categories of type, font, size, style, and alignment appropriate for the task;
 - (iii) type techniques such as drop cap, decorative letters, or embedded text frames as graphic elements;

Comment [A8]: MV from above proposed TEKS for Digital Design and Media Production (DDMP) – 1, 2A

Comment [A9]: MV from above proposed TEKS for DDMP – 1, 3, 4

Comment [A10]: MV from above proposed TEKS for DDMP – 2, 3; 21st century

Comment [A11]: MV from above proposed TEKS for DDMP – 1, 2, 3, 4, 5

- (iv) leading/kerning, automatic text flow into linked columns, widows/orphans, and text wrap; and
- (v) type measurement for inches and picas.

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- (E) apply design and layout principles and techniques to:
 - (i) incorporate the principles of design, including balance, contrast, dominant element, white space, consistency, repetition, alignment, and proximity;
 - (ii) apply the elements of design including text, graphics, and white space;
 - (iii) apply color principles appropriate to the product in order to communicate the mood for the specific audience;
 - (iv) identify the parts of pages including inside margin, outside margin, and gutter;
 - (v) create a master template to include page specifications and other repetitive elements; and
 - (vi) use style sheets including a variety of type specifications such as typeface, style, size, alignment, indents, and tabs.
- (F) demonstrate appropriate use of digital photography and editing to:
 - (i) use digital photography equipment to capture still-shot images which incorporate various photo composition techniques, including lighting, perspective, candid-versus-posed, rule of thirds, and filling the frame;
 - (ii) transfer digital images from equipment to the computer; and
 - (iii) demonstrate image enhancement techniques such as feathering, layering, color enhancement, and image selection using appropriate digital manipulation software.
- (G) demonstrate appropriate use of videography equipment and techniques to:
 - (i) use digital photography equipment to capture video which incorporates video principles such as lighting, zooming, panning, and stabilization;
 - (ii) transfer video from equipment to the computer;
 - (iii) demonstrate videographic enhancement and editing techniques such as transitions, zooming, content editing, and synchronizing audio and video using appropriate digital manipulation software; and
 - (iv) export video in digital formats to be used in various delivery systems such as podcasting, downloadable media, embedding, and streaming.
- (H) deploy digital media into print, web, and video products to:
 - (i) produce digital files in various formats such as PDF, PNG, and HTML;
 - (ii) publish integrated digital content such as video, audio, text, graphics, and motion graphics following appropriate digital etiquette standards;
 - (iii) publish and share projects using online methods such as social media and collaborative sites;
 - (iv) incorporate various digital media into a printed document such as a newsletter, poster, or report;

Comment [A12]: MV from above proposed TEKS for DDMP; 1, 2, 3, 4, 5; 21st century

Comment [A13]: MV from above proposed TEKS for DDMP; 1, 2, 3, 4, 5; 21st century

Comment [A14]: MV from above proposed TEKS for DDMP; 1, 2, 3, 4, 5; 21st century

- (v) use printing options such as tiling, color separations, and collation; and
- (vi) collect and organize student-created products to build an individual portfolio.

- (7) Solving problems. The student uses appropriate computer-based productivity tools to create and modify solutions to problems. The student is expected to:
 - (A) use desktop publishing methods in foundation and enrichment curricula;
 - (B) identify the tasks in a project and use the tools needed for completion such as word processing, pagination, utility, indexing, graphics, or drawing programs;
 - (C) use electronic productivity tools such as the word processor to edit text including move, copy, cut and paste, and spell check;
 - (D) select and use the categories of type, font, size, style, and alignment appropriate for the task;
 - (E) apply the basic elements of page design including text, graphics, headlines, and white space;
 - (F) distinguish design requirements as they relate to purposes and audiences including one surface objects, multiple or bound pages, stationery, book jackets/magazine covers, pamphlets, magazines, brochures, and labels; and
 - (G) read and use technical documentation.
- (8) Solving problems. The student uses research skills and electronic communication, with appropriate supervision, to create new knowledge. The student is expected to:
 - (A) develop technical documentation related to desktop publishing;
 - (B) demonstrate the use of technology to participate in self-directed and practical activities;
 - (C) extend the learning environment beyond the classroom through the creation and sharing of electronically formatted and published documents via electronic networks;
 - (D) synthesize new information from data gathered from interviews, print, and electronic resources; and
 - (E) demonstrate that tasks can be accomplished through technological collaboration and participate with electronic communities as a learner, initiator, contributor, and teacher/mentor.
- (9) Solving problems. The student uses technology applications to facilitate evaluation of work, both process and product. The student is expected to:
 - (A) create technology specifications for tasks and evaluation rubrics to evaluate process and product against established criteria;
 - (B) design and implement procedures to track trends, set timelines, and review/evaluate progress for continual improvement in process and product;
 - (C) resolve information conflicts and validate information through accessing, researching, and comparing data; and

- (D) — seek and respond to advice from peers in delineating technological tasks.
- (10) — Communication. The student formats digital information for appropriate and effective communication. The student is expected to:
 - (A) — define the purpose of the product and identify the specified audience;
 - (B) — use terms related to typography appropriately including categories of type and type contrasts;
 - (C) — use the principles of page design to create a product including, but not limited to, leading/kerning, automatic text flow into linked columns, widows/orphans, and text wrap;
 - (D) — create a master template to include page specifications and other repetitive tasks;
 - (E) — apply the basics of type measurement for inches and picas;
 - (F) — use type techniques as graphic elements such as drop cap, decorative letters, or embedded text frames;
 - (G) — apply color principles to communicate the mood of the product for the specific audience;
 - (H) — incorporate the principles of basic design including, but not limited to, balance, contrast, dominant element, use of white space, consistency, repetition, alignment, and proximity;
 - (I) — identify the parts and kinds of pages including inside margin, outside margin, gutter, title, and inside pages; and
 - (J) — use a variety of strategies to create effective designs, such as varying line widths and patterns, and use manipulation tools to stretch, bend, screen, rotate, follow a path, or mirror type.
- (11) — Communication. The student delivers the product electronically in a variety of media, with appropriate supervision. The student is expected to:
 - (A) — use appropriate media for creating a knowledge base with a broad perspective and communicating to the worldwide community;
 - (B) — use printing options such as tiling, color separations, collation, and previewing;
 - (C) — distinguish design and printing requirements as they relate to purposes, audiences, and final output; and
 - (D) — use styles (style sheets) including a variety of type specifications such as typeface, style, size, alignment, indents, and tabs.
- (12) — Communication. The student uses technology applications to facilitate evaluation of communication, both process and product. The student is expected to:
 - (A) — identify and employ a method to evaluate the project for design, content delivery, purpose, and audience;
 - (B) — use electronic project management tools to set milestones for completing projects and reviewing progress;
 - (C) — seek and respond to advice from peers in evaluating the product;

- ~~(D) — create technology specifications for tasks and evaluation rubrics; and~~
- ~~(E) — demonstrate that products and product quality can be evaluated against established criteria.~~

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§126.25. ~~Digital Graphics/Animation~~ Digital Art and Animation (One Credit).

(a) General requirements. The prerequisite is proficiency in the knowledge and skills described in §126.12(c) of this title (relating to Technology Applications (~~Computer Literacy~~), Grades 6-8). This course is recommended for students in Grades 9-12. This course satisfies the high school fine arts graduation requirement of §117.53, Art, Level II. The recommended, but not required, prerequisite is §117.52, Art, Level I.

Comment [A15]: Changed to reflect the addition of the fine arts credit recommendation and to modernize the title of the course.

(b) Introduction.

Comment [A16]: The Fine Arts course standards, § 117.53 Art Level II and § 126.25 Digital Graphics TEKS correlate to reflect meeting standards of each subject matter competencies.

(1) The technology applications curriculum has ~~four~~ six strands based on the National Educational Technology Standards (NETS•S) and Performance Indicators for Students developed by the International Society for Technology in Education (ISTE): ~~foundations, information acquisition, work in solving problems, and communication~~ creativity and innovation; communication and collaboration; research and information fluency; critical thinking, problem solving, and decision making; digital citizenship; and technology operations and concepts.

Comment [A17]: We recommend that this course satisfy the fine arts graduation credit requirement. Digital Art & Animation TEKS are updated to align with the Art, Level II §117.53 TEKS and are referenced in the comments below.

~~(2) Through the study of technology applications foundations, including technology related terms, concepts, and data input strategies, students learn to make informed decisions about technologies and their applications. The efficient acquisition of information includes the identification of task requirements; the plan for using search strategies; and the use of technology to access, analyze, and evaluate the acquired information. By using technology as a tool that supports the work of individuals and groups in solving problems, students will select the technology appropriate for the task, synthesize knowledge, create a solution, and evaluate the results. Students communicate information in different formats and to diverse audiences. A variety of technologies will be used. Students will analyze and evaluate the results.~~

Comment [A18]: Replaced with updated descriptions.

(2) Through the study of the six strands in technology applications, students develop college readiness skills applied to technology, including terminology, concepts, and strategies. Students learn to make informed decisions about technologies and their applications. Students learn the efficient acquisition of information using search strategies and the use of technology to access, analyze, and evaluate acquired information. By using technology as a tool that supports the work of individuals and groups in solving problems, students will select the technology appropriate for the task, synthesize knowledge, create a solution, and evaluate the results. Students communicate information in different formats and to diverse audiences. A variety of technologies will be used. Students analyze and evaluate the results.

(3) Digital Art and Animation consists of computer images and animations created with digital imaging software. Digital Art and Animation has applications in many careers, including graphic design, advertising, web design, animation, corporate communications, illustration, character development, script writing, storyboarding, directing, producing, inking, project management, editing, and the magazine, television, film, and game industries. Students in this course will produce various real-world projects and animations.

(c) Knowledge and skills.

- (1) ~~Foundations.~~ The student demonstrates creative thinking, constructs knowledge, and develops innovative products and processes using technology and appropriate use of hardware components, software programs, and their connections. -The student is expected to:
- (A) evaluate, edit, and create scripts for animations;
 - ~~(B) compare, contrast, and appropriately use the various input, processing, output, and primary/secondary storage devices;~~
 - (B)(G) identify and apply color mixing theories, and apply these theories to the creation of including harmony rules, tints, shades, gradients, color mixing, creating new colors, and the visual impacts of specific color combinations using a in the digital format;
 - ~~(C)(H) compare, contrast, and integrate the basic sound editing principles, including mixing the addition of effects and manipulation of wave forms, audio tracks, and effects;~~
 - ~~(D)(6)(A) compare and contrast the rules of composition such as the rule of thirds or the golden section/rectangle with respect to harmony and balance as well as discord and drama;~~
 - ~~(E)(6)(B) evaluate the fundamental concepts of a graphic digital art and design including such as composition, perspective, angles, and lighting, repetition, proximity, white space, balance, and contrast;~~
 - ~~(F)(6)(C) analyze the digital art designs to interpret decide the point of interest, and the attributes that determine the prominence and support of the subject,; and visual parallels between the structures of natural and human-made environments;~~
 - ~~(G)(6)(D) distinguish among the categories of typefaces while recognizing and resolving conflicts that occur through combined usage the use of typography as a design element;~~
 - ~~(H)(7)(C) use perspective, including backgrounds, light, shades and shadows, hue and saturation, and scale, to capture a focal point and create depth;~~
 - ~~(I)(7)(D) use the basic principles of design such as proportion, balance, variety, emphasis, harmony, symmetry, and unity in type, color, size, line thickness, shape, and space;~~
 - ~~(J) select and connect task appropriate peripherals such as a printer, CD-ROM, digital camera, scanner, or graphics tablet; and~~
 - ~~(J)(7)(K) edit files using appropriate digital editing tools and established design principles including such as consistency, repetition, alignment, proximity, ratio of text to white space, image file size, color use, font size, type, and style; and~~
 - ~~(K)(10)(A) identify pictorial qualities in a design such as shape and form, space and depth, or pattern and texture to create visual unity and desired effects in designs.~~
- ~~(2) Foundations. The student uses data input skills appropriate to the task. The student is expected to:~~

- Comment [A19]:** Updated to ISTE Standards.
- Comment [A20]:** 21st skills and planning skills.
- Comment [A21]:** This should be learned in the prerequisite course §126.12(c) and VA, ER.
- Comment [A22]:** We are working in the foundations of art and design by elaborating on color theory, not just the mixing of colors and VA.
- Comment [A23]:** 21st- Updating standard to current technology.
- Comment [A24]:** This is not a rule of composition and doesn't make any sense in this context.
- Comment [A25]:** Updated information.
- Comment [A26]:** Added Art II standard here and made the old TEK more concise.
- Comment [A27]:** Aligning to CRS (II)(C)(6) expectations.
- Comment [A28]:** Updated to new technology.
- Comment [A29]:** Made more concise
- Comment [A30]:** This should be learned in prerequisite class and VA.
- Comment [A31]:** Eliminated out-dated verbage.
- Comment [A32]:** VA- This should all be learned in the prerequisite class.

- (A) — demonstrate proficiency in the use and graphical integration of a variety of input devices such as keyboard, scanner, mouse, graphic tablet with pen, or digital camera; and
- (B) — compare and contrast digital input devices.

~~(2)~~(3) **Communication and collaboration Foundations.** The student uses digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning experience of others ~~complies with the laws and examines the issues regarding the use of technology in society; current trends in digital art and animation.~~ The student is expected to:

~~(A)~~(1)(E) use the vocabulary as it relates to digital ~~graphics art, audio,~~ and animation software;

~~(B)~~(8)(A) demonstrate the use of technology to participate in self-directed ~~and collaborative, meaningful~~ activities ~~within in the larger the global~~ community and society;

~~(C)~~(8)(C) participate ~~with in~~ electronic communities ~~as a learner, initiator, contributor, and teacher/mentor;~~

~~(D)~~(9)(A) create technology specifications for tasks and rubrics for the evaluation of products ~~and product quality against established criteria;~~

~~(E)~~(9)(B) design and implement procedures to track trends, set timelines, and review/evaluate ~~progress for continual improvement in process and~~ products;

~~(F)~~(9)(E) collaborate with ~~seek and respond to advice from~~ peers in delineating technological tasks;

~~(G)~~(11)(A) publish ~~and save~~ information in a variety of ways, including, ~~but not limited to, printed copy print or digital formats or monitor display; and~~

~~(H)~~(12)(A) analyze and determine and employ technology specifications to evaluate projects for design, content delivery, purpose, and audience; and

~~(I)~~(12)(B) critique original digital artwork, portfolios, and products with ~~seek and respond to advice from~~ peers ~~in evaluating the product.~~

~~(3)~~(5) **Research and information fluency Information acquisition.** The student applies digital tools to gather, evaluate, and use ~~acquires electronic~~ information ~~in a variety of formats, with appropriate supervision.~~ The student is expected to:

~~(A)~~(1)(F) distinguish between and correctly use ~~apply~~ process color (RGB and CMYK), spot color, and black ~~or~~ white;

~~(B)~~(3)(D) research the ~~impact history~~ of digital ~~graphics art and animation; in society and as an art form.~~

~~(C)~~ research career choices in digital art and animation;

~~(D)~~(A) use the Internet ~~to and~~ retrieve information in electronic formats ~~including text, audio, video, and graphics, citing the source;~~

~~(E)~~(B) demonstrate the appropriate use of digital imaging, video integration, and sound ~~in documents retrieved from an electronic format;~~

Comment [A34]: Updated to the new name of the course and included vocabulary that is not only software related, but content and industry related. It is also the CRS Foundational Skill (I)(2)(a) and 21st.

Comment [A35]: Aligns with CRS (I)(E).

Comment [A36]: Updated to ISTE standards.

Comment [A37]: Updating verbage to a higher standard.

Comment [A38]: Updated to current technology.

Comment [A39]: The beginning of the TEK is obsolete and doesn't make any sense.

Comment [A40]: Updating verbage to a higher standard.

Comment [A41]: Updated to reflect ISTE standards.

Comment [A42]: We are incorporating the §117.53 Art II requirements that serve as a foundation of artistic understanding.

Comment [A43]: We are incorporating the §117.53 Art II career requirement because this will make the students more career and college ready.

Comment [A44]: Updated information to current and future technology.

- ~~(E)~~~~(C)~~ import sounds from a variety of sources; and including, but not limited to, audio CD, tape, and microphone.

Comment [A45]: Updated Information to current and future technology.
- ~~(G)~~ create planning designs such as rough sketches, storyboards, and brainstorming materials.
- ~~(4)~~ Information acquisition. The student uses a variety of strategies to acquire information from electronic resources, with appropriate supervision. The student is expected to:

 - ~~(A)~~ use strategies to access research information from different resources, including local area networks (LANs), wide area networks (WANs), the Internet, and intranet; and
 - ~~(B)~~ obtain print and digital information from a variety of resources including, but not limited to, encyclopedias, databases, and libraries of images.

Comment [A46]: This should be learned in the prerequisite course.
- ~~(4)~~ Critical thinking, problem solving, and decision making. The student uses critical-thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources. The student is expected to:

 - ~~(A)~~~~(I)~~~~(I)~~ distinguish between and use utilize the components of animation software programs including such as cast, score, stage, and the animation control panel manipulation interface;
 - ~~(B)~~~~(I)~~~~(K)~~ distinguish between and use the different animation techniques such as of path and cell animation, onion skinning, and tweening;
 - ~~(C)~~~~(7)~~~~(F)~~ create three dimensional 3-D effects by layering images such as using foreground, middle distance, and background images;
 - ~~(D)~~~~(7)~~~~(G)~~ apply a variety of color schemes to digital designs such as including monochromatic, analogous, complementary, primary/secondary triads, cool/warm colors, and split complements;
 - ~~(E)~~~~(7)~~~~(H)~~ use the basic concepts of color and design theory such as to working in a bitmapped and vector mode, creating backgrounds, characters, and other cast members as needed for the animation;
 - ~~(F)~~~~(7)~~~~(I)~~ use the appropriate scripting language or program code to create an animation or movie;
 - ~~(G)~~~~(I)~~~~(B)~~ use a variety of lighting techniques such as including shadows and shading to create an effects; and
 - ~~(H)~~~~(I)~~~~(C)~~ define the design attributes and requirements of products created for a variety of purposes including such as posters, billboards, business cards, stationery, logos, corporate identity, advertisements, book jackets, folders, booklets, pamphlets, brochures, and magazines, and

Comment [A47]: Updates to ISTE standards.

Comment [A48]: 21st-Update terminology.

Comment [A49]: 21st- Updating to current industry standards and software capabilities of 2D animation.

Comment [A50]: Changed to 3D for consistency

Comment [A51]: Updated to new technology.
- ~~(5)~~~~(7)~~ Digital citizenship Solving problems. The student understands human, cultural, and societal issues related to technology and practices legal and ethical behavior uses appropriate computer based productivity tools to create and modify solutions to problems. The student is expected to:

 - ~~(A)~~ combine graphics, images, and sound for foundation or enrichment curricular projects;

Comment [A52]: Adding the understanding of bitmap and vector mode before they use it. Also adding in critical thinking and problem solving.

Comment [A53]: Updated to current technology.

Comment [A54]: Corporate Identity includes a higher industry standard of business cards, stationary, folders, booklets, pamphlets and teaches making these items as a whole in collaboration with each other for a business. In short, corporate identity is the entire graphical identity of a company.

Comment [A55]: Updated to reflect ISTE standards.

- (A)(3)(A) discuss copyright laws/issues ~~and model ethical acquisition~~ and use of digital information, such as attributing ideas and citing sources using established methods
- ~~(B) integrate the productivity tools including, but not limited to word processor, database, spreadsheet, telecommunications, draw, paint, and utility programs into the digital graphics;~~
- ~~(B)(3)(B) define plagiarism and~~ model respect of intellectual property ~~when manipulating, morphing, and editing graphics, video, text, and sound;~~
- ~~(C)(3)(C) demonstrate proper digital etiquette and knowledge of acceptable use policies when using technology; networks, especially resources on the Internet and intranet; and~~
- ~~(D) evaluate the validity and reliability of sources;~~
- ~~(E) use repetition of color, shape, texture, spatial relationships, line thickness, and size to develop organization and strengthen the unity of a product;~~
- ~~(L) use a variety of techniques to edit, manipulate, and change sound.~~
- (6) Information acquisition. The student evaluates the acquired electronic information. The student is expected to:
 - (A) compare and contrast the rules of composition such as rule of thirds or the golden section/rectangle with respect to harmony and balance as well as discord and drama;
 - (B) evaluate the fundamental concepts of a graphic design including composition and lighting;
 - (C) analyze the designs to decide the point of interest and the attributes that determine prominence and support of the subject; and
 - (D) distinguish among the categories of typefaces while recognizing and resolving conflicts that occur through combined usage.
- ~~(6)(8)~~ Technology operations and concepts Solving problems. The student demonstrates a sound understanding of technology concepts, systems, and operations ~~uses research skills and electronic communication, with appropriate supervision, to create new knowledge.~~ The student is expected to:
 - ~~(A)(1)(A)~~ demonstrate knowledge and appropriate use of operating systems, software applications, and communication and networking components;
 - ~~(B) demonstrate proficiency in, appropriate use of, and navigation of LANs, WANs, the Internet, and intranet for research and for sharing of resources; and~~
 - ~~(B)(1)(C)~~ make decisions regarding the selection, ~~acquisition,~~ and use of software and Internet resources ~~taking under consideration its quality, appropriateness, effectiveness, and efficiency;~~
 - ~~(C)(1)(D)~~ delineate and make necessary adjustments regarding compatibility issues with including, but not limited to, digital file formats, importing and exporting data, and cross platform ~~connectivity~~ compatibility;
 - ~~(D)(7)(J)~~ read, use, and develop technical documentation;

Comment [A57]: Took out programs that would be taught in a different class

Comment [A58]: CRS (I)(F)(1)

Comment [A59]: Redundant from TEK above (5)(H).

Comment [A60]: Updating to reflect ISTE standards

Comment [A61]: Redundant, already specified this information in a previous TEK above (2)(A).

Comment [A62]: 21st- This is an update to the current technology.

Comment [A63]: This is redundant.

~~(9) Solving problems. The student uses technology applications to facilitate evaluation of work, both process and product. The student is expected to:~~

~~(C) evaluate data by using criteria appropriate for the purpose;~~

~~(D) resolve information conflicts and validate information through accessing, researching, and comparing data;~~

~~(10) Communication. The student formats digital information for appropriate and effective communication. The student is expected to:~~

~~(D) use proximity and alignment to create a visual connection with other elements.~~

~~(11) Communication. The student delivers the product electronically in a variety of media, with appropriate supervision. The student is expected to:~~

~~(B) publish information in saved files, Internet documents, CD-ROM discs, or video.~~

~~(12) Communication. The student uses technology applications to facilitate evaluation of communication, both process and product. The student is expected to:~~

Comment [A64]: Taken out to reflect ISTE standards.

Comment [A65]: Taken out to reflect ISTE standards.

Comment [A66]: Already in TEK

Comment [A67]: Taken out to reflect ISTE standards.

Comment [A68]: Deleted because TEK above this one says the same thing.

Comment [A69]: Taken out to reflect ISTE standards.

DRAFT

§126.xx. 3-D Modeling and Animation (One Credit).

(a) General requirements. The prerequisite is proficiency in the knowledge and skills described in §126.12(c) of this title (relating to Technology Applications (Computer Literacy), Grades 6-8). This course is recommended for students in Grades 9-12. This course satisfies the high school fine art graduation requirement of §117.53, Art, Level II. The recommended, but not required, prerequisite is §117.52, Art, Level I.

(b) Introduction.

- (1) The 3-D Modeling and Animation curriculum has six strands based on the National Educational Technology Standards (NETS•S) and Performance Indicators for Students 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 six strands, students will develop college-readiness skills applied to technology, including terminology, concepts, and strategies. Students learn to make informed decisions about technologies and their applications. Students examine the efficient acquisition of information using search strategies and the use of technology to access, analyze, and evaluate acquired information. By using technology as a tool that supports the work of individuals and groups in solving problems, students will select the technology appropriate for the task, synthesize knowledge, create a solution, and evaluate results. Students communicate information in different formats and to diverse audiences. A variety of technologies will be used. Students will analyze and evaluate the results.
- (3) 3-D Modeling and Animation consists of computer images created in a virtual three dimensional environment. 3-D modeling has applications in many careers, including criminal justice, crime scene, and legal applications; construction and architecture; engineering and design; and the movie and game industries. Students in this course will produce various 3-D models of real world objects.

(c) Knowledge and skills.

- (1) Creativity and innovation. The student demonstrates creative thinking, construct knowledge, and develop innovative products and processes using technology. The student is expected to:
 - (A) evaluate, edit, and create scripts for animations;
 - (B) identify and apply color theories, including harmony rules, tints, shades, gradients, color mixing, creating new colors, and the visual impacts of specific color combinations using a digital format;
 - (C) apply texture, transparency, skinning, and contour along a 3-D object surface;
 - (D) compare, contrast, and integrate the basic sound editing principles, including mixing and manipulation of wave forms, audio tracks, and effects;
 - (E) compare and contrast the rules of composition such as the rule of thirds or the golden section/rectangle with respect to harmony and balance;

- (F) evaluate the fundamental concepts of 3-D modeling and design such as composition, perspective, angles, lighting, repetition, proximity, white space, balance, and contrast;
 - (G) analyze 3-D model objects to interpret the point of interest, prominence of the subject, and visual parallels between the structures of natural and human-made environments;
 - (H) distinguish among typefaces while recognizing and resolving conflicts that occur through the use of typography as a design element;
 - (I) use perspective, including backgrounds, spot, and directional light; ambience; shades; shadows; hue; and saturation;
 - (J) use the basic principles of design such as proportion, balance, variety, emphasis, harmony, symmetry, and unity in type, color, size, line thickness, shape, and space;
 - (K) edit files using appropriate digital editing tools and established design principles such as consistency, repetition, alignment, proximity, white space, image file size, color use, font size, type, and style; and
 - (L) identify pictorial qualities in a design such as shape and form, space and depth, or pattern and texture to create visual unity and desired effects in designs.
- (2) Communication and collaboration. The student uses digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning experience of others. The student is expected to:
- (A) use correct vocabulary as it relates to digital art, audio, and animation;
 - (B) demonstrate the use of technology to participate in self-directed and collaborative activities within the global community;
 - (C) participate in electronic communities;
 - (D) create technology specifications for tasks and rubrics for the evaluation of products;
 - (E) design and implement procedures to track trends, set timelines, and evaluate products;
 - (F) collaborate with peers in delineating technological tasks;
 - (G) publish and save information in a variety of ways, including print or digital formats;
 - (H) analyze and evaluate projects for design, content delivery, purpose, and audience; and
 - (I) critique original 3-D digital artwork, portfolios, and products with peers.
- (3) Research and information fluency. The student applies digital tools to gather, evaluate, and use information. The student is expected to:
- (A) distinguish among and correctly apply process color (RGB and CYMK), spot color, and black or white;
 - (B) research the history of 3-D modeling and 3-D animation;

- (C) research career choices in 3-D modeling and 3-D animation;
 - (D) use the Internet to retrieve information in electronic formats;
 - (E) demonstrate the appropriate use of 3-D objects, digital imaging, video integration, and sound retrieved from an electronic format;
 - (F) import sounds from a variety of sources; and
 - (G) create planning designs such as rough sketches, storyboards, and brainstorming materials.
- (4) Critical thinking, problem solving, and decision making. The student uses critical-thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources. The student is expected to:
- (A) distinguish among and utilize the components of 3-D animation software programs such as cast, score, environment, the X-Y-Z coordinate system, and the animation manipulation interface;
 - (B) distinguish among and use the different 3-D modeling techniques such as box modeling, transformation, and polygon primitives utilizing extrusion and rotation;
 - (C) distinguish among and use the different 3-D animation techniques such as path and rendering utilizing dynamics and physics;
 - (D) apply a variety of color schemes such as monochromatic, analogous, complementary, primary/secondary triads, cool/warm colors, and split complements to digital designs;
 - (E) use the basic concepts of color and design theory such as working with 3-D models and environments, characters, objects, and other cast members as needed for the animation;
 - (F) use the appropriate rendering techniques to create an animation;
 - (G) use a variety of lighting techniques such as shadow, shading, point, spot, directional, and ambient to create effects; and
 - (H) define the design attributes and requirements of a 3-D animation project.
- (5) Digital citizenship. The student understands human, cultural, and societal issues related to technology and practices legal and ethical behavior. The student is expected to:
- (A) discuss copyright laws or issues and the use of digital information such as attributing ideas and citing sources using established methods;
 - (B) define plagiarism and model respect of intellectual property; and
 - (C) demonstrate proper digital etiquette and knowledge of acceptable use policies when using technology; and
 - (D) evaluate the validity and reliability of sources.

- (6) Technology operations and concepts. The student demonstrates a sound understanding of technology concepts, systems, and operations. The student is expected to:
- (A) demonstrate knowledge and appropriate use of operating systems, software applications, and communication and networking components;
 - (B) make decisions regarding the selection and use of software and Internet resources;
 - (C) make necessary adjustments regarding compatibility issues with digital file formats, importing and exporting data, and cross platform compatibility; and
 - (D) read, use, and develop technical documentation.

DRAFT

§126.26. ~~Multimedia~~ Digital Communications in the 21st Century (One Credit).

(a) General requirements. The prerequisite for this course is proficiency in the knowledge and skills described in §126.12(c) of this title (relating to Technology Applications (~~Computer Literacy~~), Grades 6-8). This course is recommended for students in Grades 9-12.

(b) Introduction.

(1) The technology applications curriculum has ~~four~~ six strands based on the National Educational Technology Standards (NETS•S) and Performance Indicators for Students developed by the International Society for Technology in Education (ISTE): ~~foundations, information acquisition, work in solving problems, and communication~~ 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 ~~foundations, including technology-related terms, concepts, and data input strategies,~~ students learn to make informed decisions ~~about technologies and their~~ using digital tools and appropriate applications. ~~The efficient acquisition of information includes the identification of task requirements; the plan for using search strategies; and the use of technology to access, analyze, and evaluate the acquired information.~~ By using technology as a tool that supports the work of individuals and groups in solving problems, ~~online research and information resources, such as journals, newspapers, or authoritative databases,~~ students will ~~select the technology appropriate for the task,~~ synthesize knowledge, create a solution, and evaluate the results for authentic, real-world ~~local, state, national, and global issues.~~ Students support and manage the work of individuals and groups to create products to inform and persuade their proposed solutions ~~communicate information in different formats and to diverse audiences~~ using appropriate communication skills and methods of delivery. ~~A variety of technologies will be used. Students will analyze and evaluate the results.~~

(3) The purpose of this course is to prepare students for the societal demands of increased civic literacy, independent working environments, global awareness, and the mastery of a base set of analysis and communication skills. Students in this course will be expected to design and present an effective product based on well researched issues in order to thoughtfully propose suggested solutions to authoritative stakeholders. The outcome of the process and product approach is to provide students an authentic platform to demonstrate effective application of multimedia tools within the contexts of global communication, collaborative communities, and appropriately share their voice to affect change that concerns their future.

(c) Knowledge and skills.

- (1) ~~Foundations. The student demonstrates knowledge and appropriate use of hardware components, software programs, and their connections. The student is expected to:~~
- (A) ~~demonstrate knowledge and appropriate use of operating systems, software applications, and communication and networking components;~~
 - (B) ~~analyze demands for accomplishing multimedia tasks to appropriately use input, processing, output, and primary/secondary storage devices;~~

Comment [A71]: The multimedia committee determined that many of the TEKS formally covered in the multimedia class are now being offered through the CTE courses. In order to avoid repetition, the committee created a different course focused on 21st Century Learning Skills, Communication and Multimedia Applications. This course was changed to emphasize the focus on communication in order to satisfy the graduation requirement for §110.58 Communication Applications. **The multimedia committee recommends that the State Board of Education approve this course as a course that satisfies speech requirements because it aligns with the TEKS for §110.58, Communication Applications.**
The existing multimedia content has been covered in the new CTE courses, Chapter 130, Subchapter C Arts, Audio/Video Technology and Communication, Sections 130.81 – 130.87.

Comment [A72]: According to the American Management Association (AMA) 2010 Critical Skills Survey Executive Summary, more than half (51.4%) of executives said their employees were only average in effective communication skills and 46.9% of respondents said their employees were only average in creativity and innovation. (p.5) Proficiency in reading, writing and arithmetic is not sufficient if workers are unable to think critically, solve problems, collaborate, or communicate effectively. (p.7)

Comment [A73]: Specific software titles or applications are not identified in order to provide districts more flexibility.

Comment [A74]: In the two semester course, students should have the opportunity to address all levels

Comment [A75]: Application of 21st Skills rather than just knowledge acquisition.

Comment [A76]: Added to emphasize alignment to §110.58 Communication Applications.

Comment [A77]: Added to emphasize the alignment to the Communications Applications course.

Comment [A78]: This course is a capstone of CRS & 21st skill application.

- ~~(C) — make decisions regarding the selection, acquisition, and use of software in a multimedia classroom/lab taking under consideration its quality, appropriateness, effectiveness, and efficiency;~~
- ~~(D) — delineate and make necessary adjustments regarding compatibility issues including, but not limited to, digital file formats and cross platform connectivity;~~
- ~~(E) — use necessary vocabulary related to multimedia;~~
- ~~(F) — install and configure appropriate software;~~
- ~~(G) — distinguish between and correctly use process color (RGB and CYMK), spot color, and black/white;~~
- ~~(H) — identify color mixing theories and apply these theories to the creation of new colors in the digital format;~~
- ~~(I) — identify and distinguish among the basic sound editing principles including the addition of effects and manipulation of the wave form;~~
- ~~(J) — identify and use compression schemes for photo, animation, video, and graphics; and~~
- ~~(K) — distinguish between and determine the appropriate application of bitmapped and vector graphics into a multimedia project.~~

(1) Creativity and innovation. The student demonstrates the ability to analyze, evaluate, and adapt during the creative problem-solving process and demonstrates creative thinking in developing solutions to real-world issues using digital tools. The student is expected to:

- (A) generate innovative, sustainable solutions for real-world issues such as global warming, immigration, or the global economy using emerging digital tools;
- (B) gather and evaluate accurate information for feasibility and practicality as a basis for making communication decisions; and
- (C) analyze the ethical and social responsibilities as a project team when communicating with peers, stakeholders and experts.

~~(2) Foundations. The student uses data input skills appropriate to the task. The student is expected to:~~

- ~~(A) demonstrate proficiency in the use of a variety of electronic input devices including the mouse, keyboard, scanner, voice/sound recorder, disk/disc, video, and digital camera by creating files to be used in multimedia products;~~
- ~~(B) use digital keyboarding standards for data input such as one space after punctuation, the use of em/en dashes, and smart quotation marks;~~
- ~~(C) use strategies when digitally capturing files that conserve memory and retain the image integrity; and~~
- ~~(D) differentiate among audio input.~~

Comment [A79]: All revisions are based on VA due to complete change of framework, CRS, 21st, and avoidance of duplication with CTE clusters unless otherwise noted.

Comment [A80]: 21st, CRS

Comment [A81]: 21st, CRS, Added to emphasize alignment to §110.58 Communication Applications, 11.

Comment [A82]: Added to emphasize alignment to §110.58 Communication Applications, 11.

(2) Creativity and innovation. The student uses innovative thinking to develop new ideas and processes for solving real-world issues and conveying those ideas to a global audience through a persuasive digital product. The student is expected to:

- (A) examine real-world issues relating to current topics such as health care, government, business, or aerospace;
- (B) develop innovative solutions to address the issues;
- (C) create unique methods and products conveying solutions to audiences beyond the classroom such as school officials, non-profit organizations, higher education officials, government, or other stakeholders;
- (D) demonstrate the effective use and importance of verbal and nonverbal communication skills when presenting ideas and solutions to diverse audiences; and
- (E) use appropriate techniques to manage communication apprehension, build self-confidence, and gain command of information.

Comment [A84]: Added to align to for **§110.58 Communication Applications, 4H.**

(3) Communication and collaboration. The student develops a process to effectively communicate with peers, experts, and other audiences about current issues and solutions to global problems. The student demonstrates innovative uses of a wide range of emerging technologies, including online learning, mobile devices, digital content, and Web 2.0 tools such as podcasting, wikis, and blogs. The student is expected to:

- (A) ~~(8)(A)~~ participate with in appropriate electronic communities as a learner, initiator, and contributor, and teacher/mentor and use technology to participate in self-directed and practical activities in the larger community and society;
- (B) ~~(8)(D)~~ extend the learning environment beyond the school walls through the creation and linking of multimedia products via electronic networks using appropriate digital tools;
- (C) collaborate with a variety of field experts;
- (D) prepare for, organize, and participate in an informative or persuasive group discussion with an audience; and
- (E) participate appropriately in conversations by making clear requests, giving accurate directions, and asking purposeful questions.

Comment [A85]: Added to align to for **§110.58 Communication Applications, 4I.**

Comment [A86]: Added to align to for **§110.58 Communication Applications, 2E, 2F and 3B.**

(4) Communication and collaboration. The student uses digital tools to facilitate collaboration and communication in the design, development, and evaluation of products offering solutions to real-world issues. The student designs a collaborative working environment that enables a group to investigate a local, state, national, or global issue. The student is expected to:

- (A) design and organize resources to create an effective collaborative environment;
- (B) analyze and evaluate effective communication;
- (C) demonstrate leadership by managing project activities such as timelines, research, product development, marketing material, and effective communication skills;

Comment [A87]: Added to align to for **§110.58 Communication Applications, 2I.**

Comment [A88]: Added to emphasize alignment to **§110.58 Communication Applications, 3G.**

- (D) demonstrate effective management of diverse peer-group dynamics such as solving problems, managing conflicts, and building consensus; and
- (E) evaluate original products for accuracy, validity, and compliance with copyright laws.
- ~~(5) Information acquisition. The student acquires electronic information in a variety of formats, with appropriate supervision. The student is expected to:~~
 - ~~(A) acquire information in electronic formats including text, audio, video, and graphics, citing the source; and~~
 - ~~(B) identify, create, and use available file formats including text, image, video (analog and digital), and audio files.~~
- ~~(5)~~(4) Research and information fluency ~~Information acquisition~~. The student uses a variety of strategies to acquire and evaluate information relating to real-world issues from ~~electronic resources, with appropriate supervision~~. The student is expected to:
 - ~~(A) use strategies to access research information from different resources, including local area networks (LANs), wide area networks (WANs), the Internet, and intranet; and~~
 - (A) locate authoritative information from primary and secondary sources such as field experts, online full-text databases, or current news databases;
 - ~~(B) apply appropriate electronic search strategies in the acquisition of information including keyword and Boolean search strategies.~~
 - (B) make decisions regarding the selection, acquisition, and use of information gathered, taking under consideration its quality, appropriateness, effectiveness, and level of interest to society; and
 - (C) demonstrate fluency in the use of a variety of electronic sources such cloud computing, emerging collaboration technologies, data mining strategies, and mobile or other technologies.
- (6) Research and information fluency ~~Information acquisition~~. The student uses a variety of digital tools to synthesize information relating to real-world issues in student-created materials ~~evaluates the acquired electronic information~~. The student is expected to:
 - (A) construct real-world informational materials that inform, persuade, or recommend reform of selected issues; and
 - ~~(B) use fundamental concepts of graphic design including visual composition and lighting when analyzing multimedia.~~
 - (B)(A) identify and employ a method to evaluate the design, functionality, and accuracy of the student-created materials ~~accessed information~~; and
 - (C) use effective strategies to organize and outline presentations to support and clarify points;
- ~~(7) Solving problems. The student uses appropriate computer-based productivity tools to create and modify solutions to problems. The student is expected to:~~
 - ~~(A) use foundation and enrichment curricula in the creation of multimedia products;~~

Comment [A89]: Added to emphasize alignment to §110.58 Communication Applications, 3H.

Comment [A90]: Added to emphasize alignment to §110.58 Communication Applications, 4C.

Comment [A91]: Added to emphasize alignment to §110.58 Communication Applications, 4E and 4G.

Comment [A92]: Added to emphasize alignment to §110.58 Communication Applications, 4D and 4E.

- ~~(B) — select and integrate computer-based productivity tools, including, but not limited to, word processor, database, spreadsheet, telecommunications, draw, paint, and utility programs to develop and modify solutions to problems and to create new knowledge for multimedia products;~~
- ~~(C) — use technology tools to create a knowledge base with a broad perspective;~~
- ~~(D) — apply color principles to communicate the mood of the product for the specific audience;~~
- ~~(E) — integrate path and cell animation modules appropriately into multimedia products;~~
- ~~(F) — use the appropriate scripting language to create a multimedia sequence;~~
- ~~(G) — edit files using established design principles including consistency, repetition, alignment, proximity, ratio of text to white space, image file size, color use, font size, type, and style; and~~
- ~~(H) — read and use technical documentation.~~
- (7) Critical thinking, problem solving and decision making. The student uses critical-thinking skills to conduct research, manage products, solve problems, and make informed decisions for real-world local, state, national, and global issues. The student is expected to:
 - (A) identify and define authentic problems and significant questions for investigation;
 - ~~(B)(9)(A)~~ design and implement procedures to track trends, set timelines, and review/evaluate progress for continual improvement in process and product project completions; and
 - (C) read and use technical documentation, including appropriate help options, to complete tasks; and
 - (D) analyze the audience, occasion, and purpose when designing presentations.
- ~~(8) Solving problems. The student uses research skills and electronic communication, with appropriate supervision, to create new knowledge. The student is expected to:~~
 - ~~(B) — demonstrate proficiency in, appropriate use of, and navigation of LANs, WANs, the Internet, and intranet for research and for sharing of resources;~~
 - ~~(C) — integrate and use efficiently and effectively a variety of multimedia programs and tools including linear/non-linear authoring tools, image/video editing tools, compression programs, draw/paint/text creation tools;~~
 - ~~(E) — develop technical documentation related to multimedia;~~
 - ~~(F) — participate in different roles and jobs of a multimedia production crew including project manager, lead programmer, writer, art director, sound engineer, researcher, animator, and presenter;~~
 - ~~(G) — distinguish among and appropriately integrate 3-D modeling, animation, and rendering software into multimedia products;~~
 - ~~(H) — import video into the digital format for integration into multimedia products; and~~

Comment [A93]: Added to emphasize alignment to §110.58 Communication Applications, 4A.

- ~~(F) — capture, record, and integrate sampled and Musical Instrument Digital Interface (MIDI) sound in different sound rates, resolutions, and channels.~~
- (8) Critical thinking, problem solving and decision making. The student creates a product presenting solutions for real-world local, state, national, and global issues. The student is expected to:
- ~~(A)(9)(C)~~ create technology specifications for tasks and rubrics to evaluate products and product quality against established criteria; ~~and~~
- ~~(B)(9)(D)~~ resolve information conflicts and validate information by ~~accessing, researching, and comparing data and demonstrate that products and product quality can be evaluated against established criteria;~~
- (C) represent diverse perspectives in problem solutions; and
- (D) prepare and use visual or auditory aids, such as scripts, notes or digital applications, to enhance presentations;
- ~~(9) — Solving problems. The student uses technology applications to facilitate evaluation of work, both process and product. The student is expected to:~~
- ~~(B) — seek and respond to advice from peers and professionals in delineating technological tasks;~~
- (9)(3) Digital citizenship Foundations. The student examines ethical and legal behavior to demonstrate leadership as a digital citizen complies with the laws and examines the issues regarding the use of technology in society. The student is expected to:
- ~~(A) discuss copyright laws/issues and model ethical acquisition and safe and ethical use of digital information, citing sources using established methods;~~
- ~~(B)(C)~~ model respect of intellectual property when manipulating, morphing, or editing graphics, video, text, and sound;
- (C) use technology applications in a positive manner which supports productivity, collaboration, and continuing education; and
- ~~(D) — provide examples of the role of multimedia in society.~~
- (D)(B) demonstrate proper use professional etiquette and protocol in situations such as making introductions, offering and receiving criticism, and communicating with digital tools knowledge of acceptable use policies when using networks, especially resources on the Internet and intranet;
- ~~(10) — Communication. The student formats digital information for appropriate and effective communication. The student is expected to:~~
- ~~(A) — identify quality in multimedia design such as consistency, alignment, repetition, and proximity;~~
- ~~(B) — use content selection and presentation for the defined audience and communication purpose; and~~
- ~~(C) — format the multimedia project according to defined output specifications including target audience and viewing environment.~~

Comment [A94]: Added to emphasize alignment to §110.58 Communication Applications, 4F and 4G.

Comment [A95]: Added to align to for §110.58 Communication Applications, 2D

(10) Digital citizenship. The student demonstrates ethical and legal behavior in the creation of student products. The student is expected to:

- (A) use collaborative tools and strategies; and
- (B) use digital tools to correctly document sources such as in bibliographies or works cited.

~~(11) Communication. The student delivers the product electronically in a variety of media, with appropriate supervision. The student is expected to:~~

- ~~(A) publish information in a variety of ways including, but not limited to, printed copy or monitor display; and~~
- ~~(B) publish information in saved files, Internet documents, CD-ROM discs, or video.~~

(11) Technology operations and concepts. The student will make decisions regarding the selection, acquisition, and use of digital tools in a multimedia classroom/lab taking under consideration the quality, appropriateness, effectiveness, and efficiency of the tools. The student is expected to:

- (A) determine the most appropriate file type based on universally recognized file formats, such as PDF, .TXT, .RTF, and .JPG;
- ~~(B)(I)(J)~~ use compression schemes for photo, animation, video, and graphics; and
- (C) distinguish among appropriate color, sound, and design principles, such as consistency, repetition, alignment, proximity, ratio of text to white space.

Comment [A96]: Moved from (c) (1) (C) as a TEK to a student objective.

~~(12) Communication. The student uses technology applications to facilitate evaluation of communication, both process and product. The student is expected to:~~

- ~~(A) determine and employ technology specifications to evaluate projects for design, content delivery, purpose, and audience; and~~
- ~~(B) seek and respond to input from peers and professionals in evaluating the product.~~

Comment [A97]: Revised from (1) H, I, J, K

(12) Technology operations and concepts. The student demonstrates knowledge through various cloud and network technologies such as web-based interactive presentations, document sharing, and online scholarly databases. The student is expected to:

- ~~(A)(I)(E)~~ use necessary vocabulary related to multimedia digital tools;
- (B) demonstrate how to retrieve and discriminate between authoritative and non-authoritative data sources; and
- (C) adopt, adapt, and transfer prior knowledge to multiple situations when retrieving, manipulating, and creating original digital projects.

126.27. Digital Video and Audio Design ~~Video Technology~~ (One Credit)

(a) General requirements. ~~The prerequisite for this course is proficiency in the knowledge and skills described in §126.12(c) of this title (relating to Technology Applications (Computer Literacy), Grades 6-8). This course is recommended for students in Grades 9-12.~~

(b) Introduction

(1) The technology applications curriculum has ~~four~~ six strands based on the National Educational Technology Standards (NETS•S) and Performance Indicators for Students developed by the International Society for Technology in Education (ISTE): ~~foundations, information acquisition, work in solving problems, and communication creativity and innovation; communication and collaboration; research and information fluency; critical thinking, problem solving and decision making; digital citizenship; and technology operations and concepts.~~

Comment [A99]: Group decided everyone would follow the ISTE standards in this order.

~~(2) Through the study of technology applications foundations, including technology related terms, concepts, and data input strategies, students learn to make informed decisions about technologies and their applications. The efficient acquisition of information includes the identification of task requirements; the plan for using search strategies; and the use of technology to access, analyze, and evaluate the acquired information. By using technology as a tool that supports the work of individuals and groups in solving problems, students will select the technology appropriate for the task, synthesize knowledge, create a solution, and evaluate the results. Students communicate information in different formats and to diverse audiences. A variety of technologies will be used. Students will analyze and evaluate the results.~~

(c) Knowledge and skills.

Comment [A100]: Updated terminology in this section. CRS & 21st

~~(1) Foundations. The student demonstrates knowledge and appropriate use of hardware components, software programs, and their connections. The student is expected to:~~

- ~~(A) demonstrate knowledge and appropriate use of digital and analog video systems, software applications, and communication and networking components;~~
- ~~(B) compare, contrast, and appropriately use the various input, processing, output, and primary/secondary storage devices;~~
- ~~(C) make decisions regarding the selection, acquisition, and use of software taking under consideration its quality, appropriateness, effectiveness, and efficiency;~~
- ~~(D) delineate and make necessary adjustments regarding compatibility issues including, but not limited to, digital file formats and cross platform connectivity;~~
- ~~(E) use vocabulary related to video technology; and~~
- ~~(F) compare and contrast linear and nonlinear editing.~~

Comment [A101]: Deleted this section because we felt like the terminology was dated. We updated the terminology and moved it to a different section.

(1) Creativity and innovation. The student applies academic knowledge and skills in audio and video projects. The student is expected to:

- (A) apply English language arts knowledge and skills by demonstrating the use of appropriate technical concepts;

Comment [A102]: We felt this section was vital because it shows how the students will apply their English, Math & Problem solving skills to video projects.

- (B) apply English language arts knowledge and skills by demonstrating the use of vocabulary and correct grammar and punctuation to write and edit documents; and
- (C) incorporate knowledge of mathematics by determining a feasible resolution and aspect ratio to keep a file;
- ~~(2) Foundations. The student uses data input skills appropriate to the task. The student is expected to:
 - ~~(A) outline differences among electronic input devices as related to video technology; and~~
 - ~~(B) demonstrate proficiency in the use of a variety of electronic input devices including the keyboard, mouse, disk/disc, modem, scanner, voice/sound recorder, and digital video by incorporating such components into the video-related product.~~~~
- (2) Creativity and innovation. The student understands and examines problem-solving methods. The student is expected to employ critical-thinking and interpersonal skills independently and in teams to solve problems.
- ~~(3) Foundations. The student complies with the laws and examines the issues regarding the use of technology in society. The student is expected to:
 - ~~(A) discuss copyright laws/issues and model ethical acquisition and use of digital and video information, citing sources using established methods;~~
 - ~~(B) demonstrate proper etiquette and knowledge of acceptable use policies when using networks, especially resources on the Internet and intranet; and~~
 - ~~(C) analyze the impact of video technology on society.~~~~
- (3) Creativity and innovation. The student applies information technology applications. The student is expected to:
 - (A) use personal information management, e-mail, Internet, writing and publishing, presentation, and spreadsheet or database applications for audio or video production projects;
 - (B) demonstrate an understanding of the impact of participation in videoconferencing and other social network environments; and
 - (C) demonstrate an understanding of the responsibility of digital publications in social network environments.
- ~~(4) Information acquisition. The student uses a variety of strategies to acquire information from electronic resources, with appropriate supervision. The student is expected to:
 - ~~(A) use strategies to access research information from different resources including local area networks (LANs), wide area networks (WANs), the Internet, and intranet; and~~
 - ~~(B) construct and use appropriate electronic search strategies in the acquisition of information including keyword and Boolean search strategies.~~~~

Comment [A103]: Moved to place all SEs under one strand of Digital Citizenship

- (4) Creativity and innovation. The student understands design systems. The student is expected to analyze and summarize the history and evolution of the audio and video production fields.
- ~~(5) Information acquisition. The student acquires electronic information in a variety of formats, with appropriate supervision. The student is expected to:
 - ~~(A) acquire information in electronic formats including text, audio, video, and graphics, citing the source;~~
 - ~~(B) engage in preproduction planning by surveying the site and obtaining necessary permits and release forms; and~~
 - ~~(C) acquire information from on-line help and other forms of documentation.~~~~
- (5) Communication and collaboration. The student understands professional communication strategies. The student is expected to:
 - (A) adapt language for audience, purpose, situation, and intent such as structure and style;
 - (B) organize oral and written information;
 - (C) interpret and communicate information, data, and observations;
 - (D) present formal and informal presentations;
 - (E) apply active listening skills;
 - (F) listen to and speak with diverse individuals;
 - (G) exhibit public relations skills;
 - (H) employ leadership skills;
 - (I) employ collaborative and conflict-management skills;
 - (J) conduct and participate in meetings; and
 - (K) employ mentoring skills.
- ~~(6) Information acquisition. The student evaluates the acquired electronic information. The student is expected to:
 - ~~(A) identify and employ a method to evaluate the information; and~~
 - ~~(B) demonstrate skill in testing the accuracy and validity of the information.~~~~
- (6) Research and information fluency. The student understands the pre-production process. The student is expected to:
 - (A) identify critical elements in the pre-production stage, including design procedures, timeline development, technology specifications, scripting techniques, and budgeting procedures;
 - (B) analyze the script and storyboard development processes for a successful production;
 - (C) identify and participate in the team roles required for completion of a production;
 - (D) identify equipment, crew, and cast requirements for a scripted production; and

[Redacted]

Comment [A105]: The sections meets CRS, VA, and 21st standards.

Comment [A106]: Updated to 21st trends and specific skills a student would need for CRS or to get a job in the Video industry.

- (E) understand the casting or audition process.
- ~~(7) Solving problems. The student uses appropriate computer-based productivity tools to create and modify solutions to problems. The student is expected to:
 - ~~(A) use foundation and enrichment curricula in the development of video and digital products;~~
 - ~~(B) integrate productivity tools including, but not limited to, video editor, sound editor, word processor, database, spreadsheet, telecommunications, draw, paint, and utility programs to develop and modify solutions to problems for video productions;~~
 - ~~(C) create video technology products for a variety of purposes and audiences; and~~
 - ~~(D) develop technical documentation related to video technology.~~~~
- (7) Critical thinking, problem solving, and decision making. The student develops employability characteristics. The student is expected to:
 - (A) identify and participate in training, education, or certification required for employment;
 - (B) identify and demonstrate positive work behaviors and personal qualities needed to be employable;
 - (C) demonstrate skills related to seeking and applying for employment;
 - (D) create a video portfolio to document work experiences, licenses, certifications, and work samples;
 - (E) demonstrate skills in evaluating and comparing employment opportunities; and
 - (F) examine employment opportunities in entrepreneurship.
- ~~(8) Solving problems. The student uses research skills and electronic communication, with appropriate supervision, to create new knowledge. The student is expected to:
 - ~~(A) participate with electronic communities as a learner, initiator, contributor, and teacher/mentor;~~
 - ~~(B) demonstrate proficiency in, appropriate use of, and navigation of LANs and WANs, the Internet, and intranet for research and for sharing of resources;~~
 - ~~(C) participate in relevant activities in the larger community and society to create electronic projects;~~
 - ~~(D) extend the learning environment beyond the school walls through the creation and sharing of digital and video products via electronic networks;~~
 - ~~(E) demonstrate knowledge in composition including ratio of image to frame, position in frame, line of gaze, pan/tilts, movement, and perspective;~~
 - ~~(F) demonstrate proficiency in basic camera techniques including zoom, focus, iris control, white balance, and filters;~~
 - ~~(G) create visual communication by applying the strategies of script writing;~~
 - ~~(H) engage in preproduction activities including storyboarding, script writing, production, contracting, and scheduling;~~~~

Comment [A107]: CR Problem Solving 1-3. We felt like we needed to be specific on what Collaborative Interaction skills were needed for Video Tech.

- ~~(I) — utilize lighting techniques including key, fill, and backlight, using incident/reflected light, color temperatures, and filter use;~~
 - ~~(J) — use audio techniques, including microphone variances and audio mixers, and edit and integrate digital sounds;~~
 - ~~(K) — participate in different roles and jobs of a production crew including executive producer, producer, director, engineer, script writer, editor, camera person, presenters, and audio technicians;~~
 - ~~(L) — apply appropriate post-production techniques including editing and creating control and/or time-coded tracks, transitions, audio levels, background music, and special sound effects;~~
 - ~~(M) — apply 2-D and 3-D animation effects to video;~~
 - ~~(N) — use character generators, fonts, colors, and principles of compositions to create graphic images;~~
 - ~~(O) — create captions and/or titles for video and graphics;~~
 - ~~(P) — use different compression techniques, and/or programs; and~~
 - ~~(Q) — demonstrate knowledge in outputting digital video to analog and analog video to digital.~~
- (8) Digital citizenship. The student applies ethical decision making and complies with laws regarding the use of technology in audio and video production. The student is expected to:
- (A) exhibit ethical conduct related to interacting with others and provide proper credit for ideas;
 - (B) discuss and apply copyright laws in relation to fair use and acquisition;
 - (C) discuss what defines intellectual property and how to show appropriate respect;
 - (D) analyze the ethical impact of the audio and video production industry on society;
 - (E) implement personal and workplace safety rules and regulations;
 - (F) follow emergency procedures; and
 - (G) examine and summarize safety-related problems that may result from working with electrical circuits.
- ~~(9) Solving problems. The student uses technology applications to facilitate evaluation of work, both process and product. The student is expected to:~~
- ~~(A) — design and implement procedures to track trends, set timelines, and review/evaluate progress for continual improvement in process and product;~~
 - ~~(B) — seek and respond to advice from peers and professionals in delineating technological tasks;~~
 - ~~(C) — create technology specifications for tasks and evaluation rubrics;~~
 - ~~(D) — resolve information conflicts and validate information by accessing, researching, and comparing data; and~~
 - ~~(E) — monitor process and product quality using established criteria.~~

Comment [A108]: Changed per feedback

(9) Technology operations and concepts. The student develops a basic understanding of the history, current practice, future trends, and procedural protocols in the use of audio and video production. The student is expected to:

- (A) explain the origin and evolution of audio, video, and film;
- (B) describe how the changing technology impacts the digital society;
- (C) define terminology associated with the industry;
- (D) apply knowledge of audio and video script production;
- (E) discuss the impact of audio and video selection on human emotion;
- (F) demonstrate the use of audio and video for a three-screen environment, including cell phones, television monitors, and computer screens;
- (G) demonstrate various videography techniques, including picture composition, video composition, audio composition, editing, and delivery;
- (H) understand the differences in linear and nonlinear systems;
- (I) demonstrate knowledge of control peripherals for capturing or ingesting media;
- (J) demonstrate the skills needed to create special lighting, animation, and voice-over effects with appropriate resources; and
- (K) format digital information for effective communication for a defined audience with the use of appropriate camera perspectives, color techniques, and content selection.

Comment [A109]: Changed per feedback

~~(10) Communication. The student formats digital information for appropriate and effective communication. The student is expected to:~~

- ~~(A) use font attributes and color to ensure that products are appropriate for the defined audience and communication purpose;~~
- ~~(B) use white space and graphics to ensure that products are appropriate for the defined audience and communication purpose;~~
- ~~(C) use camera perspective to ensure that products are appropriate for the defined audience and communication purpose; and~~
- ~~(D) use content selection and presentation to ensure that products are appropriate for the defined audience and communication purpose.~~

(10) Technology operations and concepts. The student understands the post production process. The student is expected to:

- (A) select the appropriate evaluation and delivery formats such as a product evaluation rubric, job performance critique, and client and audience feedback survey; and
- (B) deliver the product in a variety of media forms such as social networks, collaborative workspaces, and cloud environments.

Comment [A110]: Updated to 21st. We felt it was very important for the students to have industry design skills.

- ~~(11) Communication. The student delivers the product electronically in a variety of media, with appropriate supervision. The student is expected to:
 - ~~(A) publish information in a variety of ways including, but not limited to, printed copy or monitor display; and~~
 - ~~(B) publish information in saved files, Internet documents, CD-ROM discs, or video.~~~~
- ~~(12) Communication. The student uses technology applications to facilitate evaluation of communication, both process and product. The student is expected to:
 - ~~(A) evaluate the project for design, content delivery, purpose, and audience using established criteria;~~
 - ~~(B) seek and respond to advice from peers and professionals in evaluating the product; and~~
 - ~~(C) research the best method of distribution, number of copies of finished product, and appropriate method for promoting product.~~~~

DRAFT

§126.28. Web Mastering Design (One Credit).

- (a) General requirements. This is an introductory course ~~The prerequisite for this course is proficiency in the knowledge and skills described in _____ of this title (relating to Technology Applications (Computer Literacy), Grades 6-8).~~ This course is recommended for Students in Grades 9-12. There is no prerequisite for this course.
- (b) Introduction.
 - (1) The technology applications curriculum has ~~four~~ six strands based on the National Educational Technology Standards (NETS•S) and Performance Indicators for Students developed by the International Society for Technology in Education (ISTE): ~~foundations, information acquisition, work in solving problems, and communication~~ 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 foundations, including technology related terms, concepts, and data input strategies, students learn to make informed decisions about technologies and heir applications. The efficient acquisition of information includes the identification of task requirements; the plan for using search strategies; and the use of technology to access, analyze, and evaluate the acquired information. By using technology as a tool that supports the work of individuals and groups in solving problems, students will select the technology appropriate for the task, synthesize knowledge, create a solution, and evaluate the results. Students communicate information in different formats and to diverse audiences. A variety of technologies will be used. Students will analyze and evaluate the results.~~
 - (2) The integration of the global society and the exchange of information through innovative and diverse media that require the effective communication of multiple data elements to display use of high quality and complex media that is created with the dynamic end-user expectations. These adaptations drive the creation of new tools to allow students a selection process of powerful and effective ways through social communication that promotes their competitive development. Therefore, as we focus our insightful vision to the future, students are presented with courses that follow various challenges and changing trends in their productive capacity.
- (C) Knowledge and skills.
 - (1) Creativity and innovation ~~Foundations.~~ The student demonstrates creative thinking, construct knowledge, and develop innovative products and processes using technology knowledge and appropriate use of hardware components, software programs, and their connections. The student is expected to:
 - (A)(8)(F) demonstrate proficiency in local and online collaboration ~~participate with electronic communities as a learner, initiator, contributor, and teacher/mentor;~~ and
 - (B)(7)(D) create WWW pages a website using specific web editors and web authoring tools such as text-based editing programs or graphical-based editing programs;
 - (C) evaluate the accessibility and usability of an original website as it relates to the target audience;

Comment [A111]: Current WM TEKS

- (D) conceptualize new possible technologies based on current technical trends;
 - (E) analyze the use of virtualization such as virtual classrooms, distance learning, virtual storage, and a virtual operating system;
 - (F)(A) demonstrate knowledge and appropriate use of operating systems, software applications, and communication and networking components; and
 - (G)(C) make decisions regarding the selection, acquisition, and use of software taking under consideration its quality, appropriateness, effectiveness, and efficiency;
- (2) ~~Foundations. The student uses data input skills appropriate to the task. The student is expected to:~~
- (A) ~~outline differences among a variety of electronic input devices; and~~
- (2) Communication and collaboration. The student uses digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others. The student is expected to:
- (A) analyze the proper and acceptable use of digital/virtual communications technologies such as instant messaging (IM), chat, e-mail, and social networking;
 - (B) implement the proper and acceptable use of digital/virtual communications technologies, such as instant messaging (IM), chat, e-mail, and social networking;
 - (C) define and implement the acquisition, sharing, and use of files taking into consideration their primary ownership and copyright;
 - (D)(4)(C) apply decisions regarding the selection, acquisition, and sharing of ~~obtain~~ Uniform Resource Locators (URLs) used in research taking into consideration their quality, appropriateness, and effectiveness; and distinguish among the protocols including hypertext transfer protocol (http), gopher, file transfer protocol (ftp), telnet, and wide area information system (wais);
 - (E) solve problems using critical-thinking strategies; and
 - (F) compare, evaluate, and implement the use of wired versus wireless access.
- (3) Research and information fluency Foundations. The student applies digital tools to gather, evaluate, and use information ~~complies with the laws and examines the issues regarding the use of technology in society.~~ The student is expected to:
- (A)(6)(B) verify ~~demonstrate skill in testing~~ the accuracy, validity, and currency of acquired information; and
 - (B) conduct searches with Boolean operators to conduct effective searches;
 - (C)(1)(E) acquire and use appropriate vocabulary terms ~~related to web mastering and delineate between the Internet and an intranet;~~
 - (D) cite sources appropriately using established methods;

Comment [A112]: based on old 9d

- ~~(E)(A)~~ ~~discuss copyright laws/issues and~~ model ethical and legal acquisition ~~and use~~ of digital information following guidelines in the student code of conduct, including plagiarism and copyright laws, citing sources using established methods;
- (F) identify and discuss emerging technologies and their impact;
- (G) understand Internet history and structure and how they impact current use;
- (H) demonstrate appropriate use of grammar, spelling, and vocabulary when creating original work;
- (I) acquire, evaluate, and use various web standards such as World Wide Web Consortium (W3C), Ecma International, Internet Corporation for Assigned Names and Numbers (ICANN) to make informed decisions and implement standards in original work;
- (J) understand, analyze, and use interactive websites;
- (K) understand, evaluate, and determine the appropriate use of dynamic and static websites;
- ~~(L)(S)(B)~~ ~~understand, evaluate, and determine the appropriate~~ identify, create, and use ~~of open/closed source available~~ file formats ~~including text, image, video (analog and digital), and audio files, and software;~~
- (M) explain and demonstrate how search engines work such as advanced options, preferences, advertising, and search categories;
- (N) evaluate, create, and apply principles of project management, including web storyboards, site maps, job duties, time constraints, group dynamics, communication interaction, and project completion, evaluation, and feedback;
- (O) understand the use and application of a Virtual Private Network (VPN);
- ~~(P)(I)(G)~~ ~~distinguish among~~ ~~summarize the development of Internet~~ protocols, including, ~~but not limited to,~~ hypertext transfer protocol (http); ~~and~~ file transfer protocol (ftp); ~~telnet, and wide area information system (wais);~~
- ~~(Q)(I)(F)~~ summarize the technical needs of a World Wide Web (WWW) server, including ~~R~~random ~~A~~ccess ~~M~~emory (RAM), hard disk capacity, ~~C~~entral ~~P~~rocessing ~~U~~nity (CPU) speed, busses, methods of connectivity, and appropriate software; ~~and~~
- ~~(R)(Z)(B)~~ demonstrate proficiency in the use of a variety of electronic input devices such as keyboard, scanner, voice/sound recorder, mouse, touch screen, or digital video by incorporating such components while publishing WWW pages; ~~;~~
- ~~(S)(B)~~ demonstrate proper digital etiquette and knowledge of acceptable use policies when using networks, especially resources on the Internet and intranet; ~~and~~
- ~~(T)(S)(A)~~ demonstrate proficiency in; and appropriate use ~~of,~~ and navigation of local area networks (LANs), wide area networks (WANs), the Internet, and intranets for research and ~~for sharing of~~ resources sharing;

Comment [A113]: based on old 9a, 12b

- ~~(U)(4)(B)~~ construct appropriate search strategies in the acquisition of information from the Internet, including keyword searches and searches with Boolean search strategies operators; and
- ~~(V)(5)(A)~~ acquire information in electronic formats, including text, audio, video, and graphics, citing the source. ~~and~~
- (4) Critical thinking, problem solving, and decision making ~~Information acquisition~~. The student uses critical-thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources a variety of strategies to acquire information from electronic resources, with appropriate supervision. The student is expected to:
- ~~(A)~~ use local area networks (LANs) and wide area networks (WANs) including the Internet and intranet in research and resource sharing;
- (A) demonstrate the transfer and adaptation of knowledge through the creation of original work;
- (B) evaluate and implement security measures to protect original work such as firewalls and hypertext transfer protocol secure (https);
- (C) analyze and follow timelines needed to create, edit, and present original work;
- (D) verify current licensing issues for software being used for the creation of original work;
- ~~(E)~~ identify and evaluate the design and functionality of web pages using rubrics;
- (F) optimize web information for fast download such as dial-up and high speed Internet and mobile devices;
- (G) evaluate original work through self, peer, and professional review of websites;
- (H) evaluate the types, functions, and target audiences of websites;
- ~~(I)(7)(E)~~ read, use, and develop technical documents documentation;
- (J) analyze, examine, assess, and decide on servers as they relate to the management of a website;
- (K) analyze, examine, assess, and decide on a web host;
- (L) analyze, examine, assess, and decide on domain name acquisition and retention;
- ~~(M)~~ evaluate the functionality of a website such as color scheme, grammar, technological constraints, age appropriateness, cross platform usability, user relevant criteria as it relates to an intended audience;
- ~~(6)(A)~~ determine and employ methods to evaluate the design (for content delivery) and functionality (for navigation and interaction) of WWW pages and compare the method with other established methods;
- (N) identify software file formats, their characteristics, and appropriate use;
- (O) identify and apply search engine optimization (SEO) to ensure optimal website visibility;

Comment [A114]: based on old 12a

Comment [A115]: based on old 9b

- ~~(P)(6)(C)~~ investigate and choose electronic security methods for a web server to protect from unauthorized access and negative intentions; and
- ~~(Q)(8)(C)~~ draw conclusions synthesize and generate new information from data gathered from electronic and telecommunications resources; ;
- (5) Digital citizenship Information acquisition. The student understands human, cultural, and societal issues related to technology and practices legal and ethical behavior ~~acquires electronic information in a variety of formats, with appropriate supervision.~~ The student is expected to:
- (A) engage in online activities that follow appropriate behavioral, communication, and privacy guidelines, including ethics, cyberbullying, personal security, verbiage determined by the intended audience, and ethical use of files/file sharing;
- ~~(B)(7)(G)~~ implement online security guidelines, including identity protection, limited personal information sharing, and demonstrate the ability to control access to the WWW site via password protection of a secure website controls and global access/deny controls; and
- (C) engage in safe, legal, and responsible use of information and technology;
- ~~(D)(1)(D)~~ understand and respond to local, national, and global issues to ensure appropriate cross browser delineate and make necessary adjustments regarding compatibility issues including, but not limited to, digital file formats and cross platform usability connectivity;
- (E) interpret, use, and develop a safe online shared computing environment;
- (F) identify legal, ethical, appropriate and safe website marketing practices;
- (G) identify legal, ethical, appropriate, and safe multimedia usage, including video, audio, graphics, animation, and emerging trends;
- ~~(H)(3)(C)~~ analyze the impact of the WWW on society through research, interviews, and personal observation; ; and
- ~~(I)(8)(G)~~ participate in relevant and meaningful activities in the larger community and society to create electronic projects.
- (6) Technology operations and concepts Information acquisition. The student demonstrates a sound understanding of technology concepts, systems, and operations ~~evaluates the acquired electronic information.~~ The student is expected to:
- (A) demonstrate knowledge of hardware, including scanners, cameras, printers, video cameras, and external hard drives;
- (B) identify the parts of a computer and explain its functions;
- (C) summarize the need for, functionality, and use of servers;
- (D) identify the advantages and disadvantages of running a personal web server versus using a web server provider;
- ~~(E)(1)(B)~~ differentiate compare, contrast, and use appropriately the various input, processing, output, and primary/secondary storage devices;
- (F) create and implement universally accessible documents;

- (G) analyze bandwidth issues as they relate to audience, server, connectivity, and cost;
- (H)(7)(H) establish a folder/directory hierarchy for storage of a web page and its related or linked files.
- (I) create file and folder naming conventions to follow established guidelines, including spacing, special characters, and capitalization;
- (J)(7)(F) identify basic ~~create and edit WWW documents using established~~ design principles ~~when creating a website,~~ including ~~consistency, repetition, alignment, proximity, ratio of text to~~ white space, ~~image file size,~~ color use, ~~theory,~~ background color, shape, line, proximity, unity, balance (ratio of text to white space), alignment, typography, font size, type, ~~and~~ style, image file size, ~~repetition, contrast, consistency, and aesthetics;~~
- (K) demonstrate knowledge of the six core domains (gov, net, com, mil, org, edu.) and be familiar with new domain implementation;
- (L) implement escape codes, html, css, and javascript through hard coding, web editors, and web authoring programs;
- (M) identify and use file transfer protocol (ftp) client software;
- (N) implement java applet insertion;
- (O) identify and differentiate various network topologies, including physical and logical;
- (P) create, evaluate, and use web-based animation;
- (Q) create, evaluate, and use video, including editing, compression, exporting, appropriateness, and delivery;
- (R)(10)(C) demonstrate the ability to conduct secure ~~communications transactions~~ from a ~~the~~ web server to a ~~the~~ client; ;
- (S)(10)(A) use hypertext linking appropriately when creating WWW pages; ;
- (7) ~~Solving problems. The student uses appropriate computer-based productivity tools to create and modify solutions to problems. The student is expected to:~~
 - (A) ~~use technology tools to create a knowledge base with a broad perspective;~~
 - (B) ~~select and integrate appropriate productivity tools including, but not limited to, word processor, database, spreadsheet, telecommunication, draw, paint, and utility programs into the creation of WWW documents;~~
 - (C) ~~use foundation and enrichment curricular content in the creation of WWW pages;~~
- (8) ~~Solving problems. The student uses research skills and electronic communication, with appropriate supervision, to create new knowledge. The student is expected to:~~
 - (B) ~~extend teaching and learning in the local environment to the worldwide community through the creation and sharing of WWW documents;~~
 - (D) ~~create and format WWW documents containing bookmarks of on-line resources and share them electronically;~~

Comment [A116]: based on old 10b

Comment [A117]: based on old 10b

- (E) demonstrate the use of WWW pages, collaborative software, and productivity tools to create products;
- (9) Solving problems. The student uses technology applications to facilitate evaluation of work, both process and product. The student is expected to:
 - (A) design and implement procedures to track trends, set timelines, and review/evaluate progress for continual improvement in process and product;
 - (B) seek and respond to advice from peers and professionals in delineating technological tasks;
 - (C) create technology specifications for tasks and evaluation rubrics; and
 - (D) resolve information conflicts and validate information through accessing, researching, and comparing data.
- (10) Communication. The student formats digital information for appropriate and effective communication. The student is expected to:
 - (B) develop interactivity for the web server via scripting additions such as Common Gateway Interface (CGI), Java Script, or JAVA; and
- (11) Communication. The student delivers the product electronically in a variety of media, with appropriate supervision. The student is expected to:
 - (A) synthesize and publish information in a variety of ways including, but not limited to, printed copy, monitor display, Internet documents, and video; and
 - (B) identify and use LANs, WANs, and remote resources to exchange and publish information.
- (12) Communication. The student uses technology applications to facilitate evaluation of communication, both process and product. The student is expected to:
 - (A) create technology specifications for tasks and evaluation rubrics; and
 - (B) seek and respond to input from peers and professionals in evaluating the product.

§126.xx. Web Communications. (One-half Credit).

- (a) General requirements. This is an exploratory course in the knowledge and skills described in _____ of this title (relating to Technology Applications, Grades 6-8. This course is recommended for Students in Grades 8-9. This course satisfies the high school Communication Applications graduation requirement of §110.58.
- (b) Introduction
- (1) The technology applications curriculum has six strands based on the National Educational Technology Standards (NETS●S) and Performance Indicators for Students 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) The integration of the global society and its exchange of information through innovative and diverse mediums that require the effective communication of multiple data elements, to display use of high quality and complex media that is created with the dynamic end user expectations. These adaptations drive the creation of new tools to allow students a selection process of powerful and effective ways through social communication that promotes their competitive development. Therefore, as we focus our insightful vision to the future, students are presented with courses that follow various challenges and changing trends in their productive capacity.
- (C) Knowledge and skills.
- (1) Creativity and innovation. The student demonstrates creative thinking, constructs knowledge, and develops innovative products and processes using technology. The student is expected to:
 - (A) demonstrate proficiency in the use of local and online collaboration;
 - (B) create websites using web editors or web authoring programs;
 - (C) evaluate the accessibility and usability of original websites; and
 - (D) conceptualize possible technologies based on current technical trends.
 - (2) Communication and collaboration. The student learns to use digital technology to collaboratively work towards his/her own individual learning and towards the learning of others. The student is expected to:
 - (A) analyze the proper and acceptable use of digital/virtual communications technologies such as instant messaging (IM), chat, e-mail, and social networking;
 - (B) implement the proper and acceptable use of digital/virtual communications technologies such as instant messaging (IM), chat, e-mail, and social networking;
 - (C) define and implement the acquisition, sharing, and use of files taking into consideration primary ownership and copyright;

- (D) apply decisions regarding the selection, acquisition, and sharing of uniform resource locators (URLs) used in research taking into consideration their quality, appropriateness, and effectiveness; and
- (E) solve problems using critical-thinking strategies.
- (3) Research and information fluency. The student applies digital tools to gather, evaluate, and use information. The student is expected to:
 - (A) verify the accuracy, validity, and currency of acquired information;
 - (B) conduct effective searches using Boolean operators;
 - (C) acquire and use appropriate vocabulary terms;
 - (D) cite sources appropriately using established methods;
 - (E) model ethical and legal acquisition of digital information following guidelines in the student code of conduct, including plagiarism and copyright laws;
 - (F) identify and discuss emerging technologies and their impact;
 - (G) understand Internet history and structure and how they impact current use; and
 - (H) demonstrate appropriate use of grammar, spelling, and vocabulary when creating original work.
- (4) Critical thinking, problem solving and decision making. The student uses critical-thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources. The student is expected to:
 - (A) demonstrate the transfer and adaptation of knowledge through the creation of original work;
 - (B) evaluate and implement security measures such as firewalls and hypertext transfer protocol secure (https) to protect original work;
 - (C) analyze and follow timelines needed to create, edit, and present original work;
 - (D) verify current licensing issues for software being used for the creation of original work;
 - (E) identify and evaluate the design and functionality of webpages using rubrics;
 - (F) optimize web information for fast download such as dial-up and high speed Internet and mobile devices; and
 - (G) evaluate original work through self, peer, and professional review of websites.
- (5) Digital citizenship. The student understands human, cultural, and societal issues related to technology and practices legal and ethical behavior. The student is expected to:
 - (A) engage in online activities that follow appropriate behavioral, communication, and privacy guidelines, including ethics, cyberbullying, personal security, and verbiage determined by the intended audience;
 - (B) implement online security guidelines, including identity protection, limited personal information sharing, and password protection of a secure website; and

- (C) advocate and practice safe, legal, and responsible use of information and technology.
- (6) Technology operations and concepts. The student demonstrates a sound understanding of technology concepts, systems, and operations. The student is expected to:
 - (A) demonstrate knowledge of hardware such as scanners, cameras, printers, video cameras, and external hard drives;
 - (B) identify the parts of a computer and explain their functions;
 - (C) summarize the need, functionality, and use of servers;
 - (D) identify the advantages and disadvantages of running a personal web server versus using a web server provider;
 - (E) differentiate and use appropriately the various input, processing, output, and primary/secondary storage devices;
 - (F) create and implement universally accessible documents;
 - (G) analyze bandwidth issues as they relate to audience, servers, connectivity, and cost;
 - (H) establish a folder/directory hierarchy for storage of a web page and its related or linked files;
 - (I) follow file and folder naming conventions, including spacing, special characters, and capitalization; and
 - (J) identify basic design principles when creating a website.

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§126.xx. Web Game Development (One Credit)

(a) General requirements. This course is a progression of learning from the Web Design course in the knowledge and skills described in _____ of this title. This course is recommended for Students in Grades 11-12. This course satisfies the high school fine art graduation requirement of 117.52. Art, Level I. The prerequisite for this course is Web Design.

(b) Introduction

(1) The technology applications curriculum has six strands based on the National Educational Technology Standards (NETS•S) and Performance Indicators for Students 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) The integration of the global society and its exchange of information through innovative and diverse mediums that require the effective communication of multiple data elements, to display use of high quality and complex media that is created with the dynamic end user expectations. These adaptations drive the creation of new tools to allow students a selection process of powerful and effective ways through social communication that promotes their competitive development. Therefore, as we focus our insightful vision to the future, students are presented with courses that follow various challenges and changing trends in their productive capacity.

(C) Knowledge and Skills

Comment [A118]: based on art TEKS

(1) Creativity and innovation. The student demonstrates creative thinking, construct knowledge, and develop innovative products and processes using technology. The student is expected to:

- (A) research and evaluate emerging technologies;
- (B) research and evaluate augmented reality, the supplementing of reality with computer-generated imagery, such as Head's Up Display and Virtual Digital Projectors;
- (C) research, evaluate, and demonstrate the appropriate design of a web-based gaming site;
- (D) illustrate ideas for web artwork from direct observations, experiences, and imagination;
- (E) create original designs for web applications; and
- (F) demonstrate the effective use of art media to create original web designs;

Comment [A119]: 117.52(c)(1)(A)

Comment [A120]: 117.52(c)(2)(B)

Comment [A121]: 117.52(c)(2)(C)

(2) Communication and collaboration. The student uses digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others. The student is expected to:

- (A) understand and evaluate the use and appropriateness of webinars;
- (B) examine, discuss, and summarize interactive online learning environments;
- (C) distinguish between distance learning, virtual learning, and online learning;
- (D) define and evaluate Voice over Internet Protocol (VoIP);

- (E) identify and apply end-user, peer, self, and professional evaluations; and
- (F) work collaboratively to create functioning programs and gaming products.
- (3) Research and information fluency. The student applies digital tools to gather, evaluate, and use information. The student is expected to:
 - (A) research, evaluate, and create web forms for database processing;
 - (B) identify the various programming languages and differentiate among the available web programming languages;
 - (C) research, evaluate, and summarize content management systems (CMS);
 - (D) differentiate between Common Gateway Interface (CGI) and computer-generated imagery (CGI);
 - (E) discuss, analyze and summarize streaming media/content and game broadcasting;
 - (F) define and evaluate instant messaging (IM) within a game environment;
 - (G) analyze and discuss the history of gaming;
 - (H) discuss, analyze, and compare and contrast game types such as action, action-adventure, adventure, construction and management simulation, life simulation, massively multiplayer online role-playing (MMORPG), music, party, puzzle, role playing, sports, strategy, trivia, and vehicle simulation;
 - (I) discuss, analyze, and compare and contrast gaming hardware, including console, personal computer, mobile, and web;
 - (J) compare and contrast web standards versus browser-specific languages;
 - (K) research, evaluate, and summarize e-commerce;
 - (L) investigate career opportunities in programming, gaming, art, design, business, and marketing;
 - (M) research the characteristics of existing gaming websites to determine local, state, national, and global trends;
 - (N) compare and contrast historical and contemporary styles of art as applied to web site development;
 - (O) compare and contrast the use of the art elements of color, texture, form, line, space and value and the art principles of emphasis, pattern, rhythm, balance, proportion, and unity in personal web game artwork and the web game artwork of others, using vocabulary accurately;
 - (P) describe general characteristics in artwork from a variety of cultures that influence web game design.
- (4) Critical thinking, problem solving, and decision making. The student uses critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources. The student is expected to:
 - (A) select an appropriate web programming language based on given criteria;

Comment [A122]: 117.52.(c)(3)(C)

Comment [A123]: 117.52.(c)(3)(A)

Comment [A124]: 117.52.(c)(1)(B)

Comment [A125]: 117.52.(c)(3)(B)

- (B) develop requirements for a database and determine the appropriate means to insert, delete, and modify records;
 - (C) develop structured query language (SQL) statements to retrieve, insert, modify, and delete records in a database;
 - (D) design and create a flow diagram to plan a database, program, and game;
 - (E) define and identify proper use of gaming graphics, including skins, textures, environment appearance, environment mapping, raster graphics, and vector graphics;
 - (F) plan an animation, including the movement of characters, camera movements, camera angles, user point of view, mechanics of motion, backgrounds, settings, ambient objects, and environment;
 - (G) compare and contrast two-dimensional (2-D) and three-dimensional (3-D) animation;
 - (H) develop and create a gaming storyboard and script that shows the overall development of the storyline;
 - (I) identify and implement graphic and game design elements, including color, environment, time to completion, difficulty, story complexity, character development, device control, backstory, delivery, and online player(s);
 - (J) design and create decision trees for a game's artificial intelligence engine;
 - (K) compare and contrast available audio formats for optimal delivery;
 - (L) identify the similarities and differences between platforms, including the application of coding on a personal computer, mobile device, and gaming console;
 - (M) research and identify existing online game development tools;
 - (N) evaluate and determine network requirements for the delivery of online games to end-users; and
 - (O) create visual solutions by elaborating on direct observation, experiences, and imagination as they apply to original web design;
- (5) Digital citizenship. The student understands human, cultural, and societal issues related to technology and practice legal and ethical behavior. The student is expected to:
- (A) explain and understand game ratings and why games fit into certain ratings;
 - (B) assess games and game ratings in terms of their impact on societal interactions;
 - (C) evaluate and implement the legal and ethical use of copyright and fair-use guidelines;
 - (D) define and implement the acquisition, sharing, and use of files taking into consideration their primary ownership and copyright;
 - (E) model ethical and legal acquisition of digital information following guidelines in the student code of conduct, including plagiarism and copyright laws;
 - (F) monitor original work to follow appropriate behavioral, communication, and privacy guidelines, including ethics, cyberbullying, personal security,

Comment [A126]: 117.52.(c)(2)(A)

appropriate audience language, ethical use of files/file sharing, technical documentation, and online communities;

(G) interpret, evaluate, and justify artistic decisions in the creation of original art for web game design; and

Comment [A127]: 117.52.(c)(4)(A)

(H) analyze original web game artwork and digital portfolios created by peers and others to form precise conclusions about formal qualities, historical and cultural contexts, intents, and meanings;

Comment [A128]: 117.52.(c)(4)(B)

(6) Technology operations and concepts. The student demonstrates a sound understanding of technology concepts, systems, and operations. The student is expected to:

(A) create a website that includes:

- (i) interactive database such as Structured Query Language (SQL) statements, Extensible Markup Language (XML), Open Database Connectivity (ODBC);
- (ii) javascript; and
- (iii) server-side processing, including Common Gateway Interface (CGI); bitmap and vector graphics; database creation, modification, and deletion; creation and maintenance of user accounts; user authentication; and documentation; and

(B) create a fully functional online game that includes:

- (i) multiple game levels with increasing difficulty;
- (ii) high-score ranking;
- (iv) physics, including center of mass, collision detection, lighting, shading, perspective, anatomy, motion blur, lens flare, and reflections;
- (v) art, including color theory, texture, balance, lighting, shading, skinning, and drawing;
- (vi) graphics resolution, including pixel depth and compression;
- (vii) database creation, modification, and deletion;
- (viii) creation and maintenance of user accounts;
- (x) user authentication;
- (xi) artificial intelligence;
- (xii) game-level saving;
- (xiii) mathematical functions;
- (xiv) varying camera angles;
- (xv) Voice over Internet Protocol (VoIP) for online web games; and
- (xvi) documentation; and

(C) create a digital portfolio.

§126.29. Independent Study in Technology Applications (One-half to One Credit).

Comment [A129]: VA

(a) General requirements. The prerequisite for this course is completion of a high school technology applications course as identified in this subchapter and permission of the instructor/mentor for Independent Study in Technology Applications. This course may be taken at Grades ~~10-12~~ 9-12.

Comment [A130]: VA

(b) Introduction.

(1) The technology applications curriculum has ~~four~~ six strands based on the National Educational Technology Standards (NETS•S) and Performance Indicators for Students 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 ~~foundations, information acquisition, work in solving problems, and communication.~~

Comment [A131]: ER

(2) Through the study of technology applications foundations, ~~technology applications~~ including technology-related terms, concepts, and data input strategies; students learn to make informed decisions ~~about technologies and their applications~~ and develop and produce original work that exemplifies the standards identified by the selected profession or discipline; and publish the product in electronic media and print. The efficient acquisition of information includes the identification of task requirements; the plan for using search strategies; and the use of technology to access, analyze, and evaluate the acquired information. By using technology as a tool that supports the work of individuals and groups in solving problems, students will select the technology appropriate for the task, synthesize knowledge, create a solution, and evaluate the results. Students communicate information in different formats and to diverse audiences. A variety of technologies will be used. Students will analyze and evaluate the results.

Comment [A132]: VA

(c) Knowledge and skills.

(1) Creativity and innovation ~~Foundations.~~ The student demonstrates creative thinking, constructs knowledge, and develops innovative products and processes using technology and appropriate use of hardware components, software programs, and their connections. The student is expected to:

Comment [A133]: VA

(A) apply existing knowledge to promote creativity in designing new technology products or services;

~~(B)(9)(A)~~ design and implement procedures to track trends, set timelines, and review/evaluate progress for continual improvement in process and product;

~~(C)(9)(B)~~ produce electronic documentation to illustrate the progress of the project ~~including, but not limited to journals, logs, videos, pictorial documentation, multimedia products, and printed books; and;~~

~~(D)(9)(C)~~ seek and respond to input from peers and professionals in delineating technological tasks and problem solving;

~~(E)(12)(D)~~ make necessary revisions and/or proceed to the next stage of study;

~~(F)(1)(D)~~ use appropriate technology terminology in appropriate to the independent study course;

Comment [A134]: VA

(G) ~~develop and apply advanced creativity and innovation employed in technology applications skills;~~

(H)~~(7)(B)~~ identify and solve problems, individually and with input from peers and professionals, utilizing research methods and advanced ~~technology applications skills~~ creativity and innovation skills used in a selected profession or discipline;

Comment [A135]: VA

(I)~~(8)(B)~~ develop products that meet standards identified by the selected profession or discipline; and

(J)~~(8)(C)~~ produce original work to solve the identified problem and publish the product in electronic media and print;

(2)~~(10)~~ Communication and collaboration ~~Communication~~. The student uses digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning experience of others ~~formats digital information for appropriate and effective communication~~. The student is expected to:

Comment [A136]: VA

(A) format the developed projects according to defined output specifications including target audience and viewing environment; ~~and~~

(B) present findings to a panel for comment and professional response;

(C)~~(11)(A)~~ determine and implement the best method of presenting or publishing findings;

(D)~~(11)(B)~~ synthesize and publish information in a variety of ~~ways including, but not limited to, printed copy, monitor display, Internet documents, and video~~ print or digital formats; ~~and~~

(E)~~(11)(C)~~ use evolving network and Internet LANs, WANs, and remote resources, and appropriate technology skills to create, exchange and publish information;

Comment [A137]: VA

(F) develop cultural understanding and global awareness by interacting with learners of other cultures through evolving digital formats and communication methods;

Comment [A138]: VA

(G)~~(8)(A)~~ collaborate with others ~~work with a mentor~~ to determine ~~identify a~~ problem to be solved, hypotheses, and strategies to accomplish task;

(H)~~(8)(D)~~ participate with electronic communities as a learner, initiator, contributor, and facilitator/mentor; and

(I)~~(8)(E)~~ participate in relevant, meaningful activities in the larger community and society to create electronic projects.

(3)~~(4)~~ Research and information fluency ~~Information acquisition~~. The student uses ~~applies~~ digital tools to gather, evaluate, and use information ~~a variety of strategies to acquire information from electronic resources, with appropriate supervision~~. The student is expected to:

(A) use ~~local area networks (LANs) and wide area networks (WANs), including the evolving network and Internet and intranet, in~~ resources for research and resource sharing ~~of technology applications~~;

Comment [A139]: VA

(B) apply appropriate search strategies in the acquisition of information from the Internet, including keyword and Boolean search strategies; ~~and~~

(C) pose hypotheses/questions related to a selected problem;

~~(D)(5)(A)~~ acquire information using appropriate research strategies with source citations through ~~and a variety of~~ electronic formats, including interactive components, text, audio, video, ~~and~~ graphics and simulations ~~citing the source;~~ ~~and;~~

~~(E)(5)(B)~~ identify, create, and use available file formats including text, image, video ~~(analog and digital)~~ and audio files;

Comment [A140]: VA

~~(4)(7)~~ Critical thinking, problem solving, and decision making ~~Solving problems~~. The student ~~uses appropriate computer-based productivity tools to create and modify solutions to problems~~ critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources. The student is expected to:

~~(A)~~ ~~— develop and apply advanced technology applications skills;~~

~~(A)(6)(A)~~ ~~identify and employ a method to~~ evaluate the design, functionality, and accuracy of the accessed information;

(B) conduct systematic research;

(C) demonstrate creative thinking and problem solving skills;

~~(D)~~ ~~— use foundation and enrichment curricular content in the creation of products;~~

~~(D)(C)~~ ~~select and~~ integrate appropriate productivity tools, including, ~~but not limited to,~~ network, mobile access, and multimedia tools, ~~word processor, database, spreadsheet, telecommunication, draw, paint, and utility programs into~~ in the creation of solutions to problems ~~products;~~

(E) use enriched curricular content in the creation of products;

~~(E)(E)~~ synthesize and generate new information from data gathered from electronic ~~and telecommunications~~ resources; ~~and~~

~~(G)(F)~~ read and use technical documentation;

(H) write simple technical documentation relative to the audience;

~~(5)(3)~~ Digital citizenship Foundations. The student understands human, cultural, and societal issues related to technology and practice legal and ethical behavior ~~complies with the laws and examines the issues regarding the use of technology in society~~. The student is expected to:

Comment [A141]: VA

~~(A)(3)(C)~~ discuss model respect of intellectual property, privacy, sharing of information, copyright laws, and software licensing agreements ~~when manipulating, morphing, or editing graphics, video, text, and sound;~~

~~(B)(A)~~ discuss copyright laws/issues and model ethical acquisition and use of digital information, ~~citing sources using established methods;~~

(C) model respect of intellectual property when editing graphics, video, text, and sound files

~~(D)~~(B) demonstrate proper etiquette, responsible use of software, and knowledge of acceptable use policies when using networks, ~~especially resources on the Internet and intranet~~ resources; and

(E) demonstrate best practices in understanding and applying Information Security;

(F) develop and maintain a technical documentation library in a variety of formats;

(G) investigate how technology has changed and the social and ethical ramifications of computer usage;

(6)(+) Technology operations and concepts Foundations. The student demonstrates a sound understanding of technology concepts, systems, and operations ~~knowledge and appropriate use of hardware components, software programs, and their connections.~~ The student is expected to:

(A) demonstrate knowledge and appropriate use of input devices, operating systems, software applications, and communication and networking components;

~~(B) make decisions regarding the selection, acquisition, and use of software taking under consideration its quality, appropriateness, effectiveness, and efficiency;~~

(B) select, acquire, and use appropriate digital tools;

(C) delineate and make necessary adjustments regarding compatibility issues, including, ~~but not limited to~~, digital file formats and cross platform connectivity;

(D) use appropriate technology terminology and naming conventions in the Independent Study course.

~~(2) Foundations. The student uses data input skills appropriate to the task. The student is expected to:~~

~~(A) demonstrate proficiency in the use of a variety of electronic input devices including the mouse, keyboard, scanner, voice/sound recorder, disk/disc, video, and digital camera as appropriate; and~~

~~(B) use digital keyboarding standards for data input such as one space after punctuation, the use of em/en dashes, and smart quotation marks.~~

~~(6) Information acquisition. The student evaluates the acquired electronic information. The student is expected to:~~

~~(B) analyze information for validity and relevance in the confirmation, testing, and solution of the hypotheses and questions.~~

~~(12) Communication. The student uses technology applications to facilitate evaluation of communication, both process and product. The student is expected to:~~

~~(A) design and implement procedures to track trends, set timelines, and review and evaluate the product using technology tools such as database managers, daily/monthly planners, and project management tools;~~

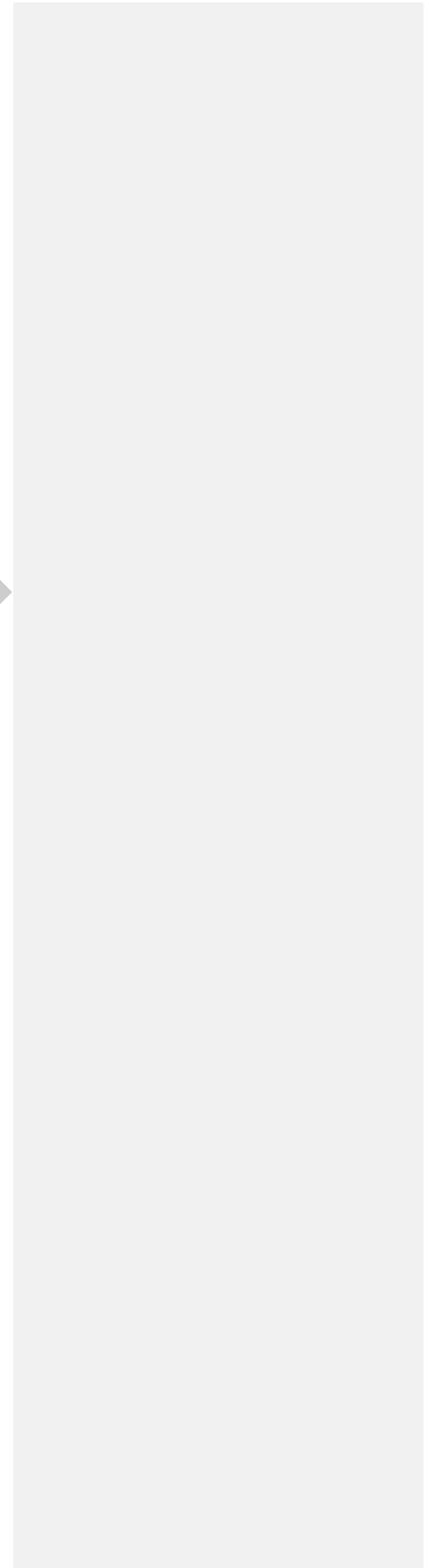
~~(B) determine and employ technology specifications to evaluate projects for design, content delivery, purpose, and audience, demonstrating that process and product can be evaluated using established criteria or rubrics;~~

Comment [A142]: VA

Comment [A143]: VA

~~(C) seek and respond to input from peers and professionals in evaluating the product; and~~

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§126.xx. Independent Study in Evolving/Emerging Technologies (One-half to One Credit).

Comment [A144]: VA

(a) General requirements. The prerequisite for this course is completion of a high school technology applications course as identified in this subchapter and permission of the instructor/mentor for Independent Study in Technology Applications. This course may be taken at Grades 9-12.

Comment [A145]: VA

(b) Introduction.

(1) The technology applications curriculum has six strands based on the National Educational Technology Standards (NETS•S) and Performance Indicators for Students 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.

Comment [A146]: ER

(2) Through the study of evolving/emerging technology, including technology-related terms, concepts, and data input strategies, students learn to make informed decisions and develop and produce original work that exemplifies the standards identified by the selected profession or discipline and publish the product in electronic media and print. The efficient acquisition of information includes the identification of task requirements; the plan for using search strategies; and the use of technology to access, analyze, and evaluate the acquired information. By using technology as a tool that supports the work of individuals and groups in solving problems, students will select the technology appropriate for the task, synthesize knowledge, create a solution, and evaluate the results. Students communicate information in different formats and to diverse audiences. A variety of technologies will be used. Students will analyze and evaluate the results.

Comment [A147]: VA

(c) Knowledge and skills.

(1) Creativity and innovation. The student demonstrates creative thinking, construct knowledge, and develop innovative products and processes using technology. The student is expected to:

Comment [A148]: VA

(A) apply existing knowledge to promote creativity in designing new technology products or services;

(B) design and implement procedures to track trends, set timelines, and review/evaluate progress for continual improvement in process and product;

(C) produce electronic documentation to illustrate the progress of the project;

(D) seek and respond to input from peers and professionals in delineating technological tasks and problem solving;

(E) make necessary revisions and/or proceed to the next stage of study;

(F) use technology terminology appropriate to the independent study course;

Comment [A149]: VA

(G) develop and apply advanced creativity and innovation employed in technology applications skills;

(H) identify and solve problems, individually and with input from peers and professionals, utilizing research methods and advanced creativity and innovation skills used in a selected profession or discipline.

Comment [A150]: VA

- (I) develop products that meet standards identified by the selected profession or discipline; and
- (J) produce original work to solve the identified problem and publish the product in electronic media and print.
- (2) Communication and collaboration. The student uses digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning experience of others. The student is expected to:
 - (A) format the developed projects according to defined output specifications including target audience and viewing environment;
 - (B) present findings to a panel for comment and professional response;
 - (C) determine and implement the best method of presenting or publishing findings;
 - (D) synthesize and publish information in a variety of print or digital formats;
 - (E) use evolving network resources, and appropriate technology skills to create, exchange and publish information;
 - (F) develop cultural understanding and global awareness by interacting with learners of other cultures through evolving digital formats and communication methods;
 - (G) collaborate with others to identify a problem to be solved, hypotheses, and strategies to accomplish task;
 - (H) participate with electronic communities as a learner, initiator, contributor, and facilitator/mentor; and
 - (I) participate in relevant, meaningful activities in the larger community and society to create electronic projects.
- (3) Research and information fluency. The student applies digital tools to gather, evaluate, and use information. The student uses a variety of strategies to acquire information from electronic resources, with appropriate supervision. The student is expected to:
 - (A) use evolving network and Internet resources for research and resource sharing of technology applications;
 - (B) apply appropriate search strategies in the acquisition of information from the Internet including keyword and Boolean search strategies;
 - (C) pose hypotheses/questions related to a selected problem;
 - (D) acquire information using appropriate research strategies with source citations through electronic formats, including interactive components, text, audio, video, graphics and simulations; and
 - (E) identify, create, and use available file formats including but not limited to text, image, video, and audio files.
- (4) Critical thinking, problem solving, and decision making. The student uses critical-thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources. The student is expected to:

Comment [A151]: VA

Comment [A152]: VA

Comment [A153]: VA

Comment [A154]: VA

- (A) evaluate the design, functionality, and accuracy of the accessed information;
 - (B) conduct systematic research;
 - (C) demonstrate creative thinking and problem solving skills;
 - (D) integrate appropriate productivity tools including, but not limited to, network, mobile access, and multimedia tools, in the creation of solutions to problems;
 - (E) use enriched curricular content in the creation of products;
 - (F) synthesize and generate new information from data gathered from electronic resources;
 - (G) read and use technical documentation; and
 - (H) write simple technical documentation relative to the audience.
- (5) Digital citizenship. The student understands human, cultural, and societal issues related to technology and practice legal and ethical behavior. The student is expected to:
- (A) discuss intellectual property, privacy, sharing of information, copyright laws, and software licensing agreements;
 - (B) model ethical acquisition and use of digital information;
 - (C) model respect of intellectual property when editing graphics, video, text, and sound files;
 - (D) demonstrate proper etiquette, responsible use of software, and knowledge of acceptable use policies when using network resources;
 - (E) demonstrate best practices in understanding and applying information security;
 - (F) develop and maintain a technical documentation library in a variety of formats, and
 - (G) investigate how technology has changed and the social and ethical ramifications of computer usage.
- (6) Technology operations and concepts. The student demonstrates a sound understanding of technology concepts, systems, and operations. The student is expected to:
- (A) demonstrate knowledge and appropriate use of input devices, operating systems, software applications, communication and networking components;
 - (B) select, acquire, and use appropriate digital tools;
 - (C) delineate and make necessary adjustments regarding compatibility issues including, but not limited to, digital file formats and cross platform connectivity; and
 - (D) use appropriate technology terminology and naming conventions.

Comment [A155]: VA

Comment [A156]: VA

Comment [A157]: VA