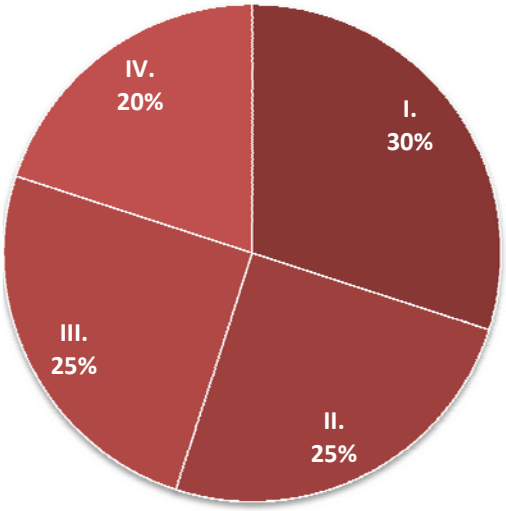
TExES™ Technology Applications EC–12 (142)
Test at a Glance

See the test preparation manual for complete information about the test along with sample questions, study tips and preparation resources.

Test Name	Technology Applications EC–12		
Test Code	142		
Time	5 hours		
Number of Questions	90 multiple-choice questions		
Format	Computer-administered test (CAT)		
	Domain	Domain Title	Approx. Percentage of Test
	I.	Technology Applications Core	30%
	II.	Digital Graphics/ Animation and Desktop Publishing	25%
	III.	Video Technology and Multimedia	25%
	IV.	Webmastering	20%

About This Test

The TExES Technology Applications EC–12 (142) test is designed to assess whether an examinee has the requisite knowledge and skills that an entry-level educator in this field in Texas public schools must possess. The 90 multiple-choice questions are based on the Technology Applications EC–12 test framework. Questions on this test range from grades EC–12. The test may contain questions that do not count toward the score.

The Test Framework

The Technology Applications EC–12 test framework is based on the educator standards for this field. The content covered by the test is organized into broad areas of content called **domains**. Each domain covers one or more of the educator standards for this field. Within each domain, the content is further defined by a set of **competencies**. Each competency is composed of two major parts:

- The **competency statement**, which broadly defines what an entry-level educator in this field in Texas public schools should know and be able to do.
- The **descriptive statements**, which describe in greater detail the knowledge and skills eligible for testing.

The educator standards being assessed within each domain are listed beginning on the next page. These are followed by a complete set of the framework's competencies and descriptive statements. Read each competency with its descriptive statements to get a more specific idea of the knowledge you will be required to demonstrate on the test.

Educator Standards

Technology Applications EC–12 Standard I
All teachers use technology-related terms, concepts, data input strategies and ethical practices to make informed decisions about current technologies and their applications.

Technology Applications EC–12 Standard II
All teachers identify task requirements, apply search strategies, and use current technology to efficiently acquire, analyze and evaluate a variety of electronic information.

Technology Applications EC–12 Standard III
All teachers use task-appropriate tools to synthesize knowledge, create and modify solutions and evaluate results in a way that supports the work of individuals and groups in problem-solving situations.

Technology Applications EC–12 Standard IV
All teachers communicate information in different formats and for diverse audiences.

Technology Applications EC–12 Standard V
All teachers know how to plan, organize, deliver and evaluate instruction for all students that incorporates the effective use of current technology for teaching and integrating the Technology Applications Texas Essential Knowledge and Skills (TEKS) into the curriculum.

Technology Applications EC–12 Standard VII
The desktop publishing teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in desktop publishing, in addition to the content described in Technology Applications Standards I–V.

Technology Applications EC–12 Standard VIII
The digital graphics/animation teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in digital graphics/animation, in addition to the content described in Technology Applications Standards I–V.

Technology Applications EC–12 Standard IX
The multimedia teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in multimedia, in addition to the content described in Technology Applications Standards I–V.

Technology Applications EC–12 Standard X
The video technology teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in video technology, in addition to the content described in Technology Applications Standards I–V.

Technology Applications EC–12 Standard XI
The Web mastering teacher has the knowledge and skills needed to teach the Foundations, Information Acquisition, Work in Solving Problems and Communication strands of the Technology Applications Texas Essential Knowledge and Skills (TEKS) in Web mastering, in addition to the content described in Technology Applications Standards I–V.

Domains and Competencies

DOMAIN I — TECHNOLOGY APPLICATIONS CORE

Standards Assessed: Technology Applications 8–12 I–V

Competency 001: *The Technology Applications teacher knows technology terminology and concepts; the appropriate use of hardware, software and digital files; and how to acquire, analyze and evaluate digital information.*

The beginning teacher:

A. Knows technology terminology and concepts.

B. Knows the appropriate use of hardware components (e.g., input, processing, output, primary/secondary storage devices), operating systems, software applications and networking components.

C. Knows how to select, connect and use a variety of input, output and storage devices and peripherals (e.g., scanner, voice/sound recorders, touch screen, digital camera, printer).

D. Knows how to evaluate software (e.g., graphics, animation, multimedia, video, Web authoring) for quality, appropriateness, effectiveness and efficiency and how to make decisions regarding its proper acquisition and use.

E. Knows how to perform basic application functions (e.g., opening an application program; creating, modifying, saving and printing documents) and how to access, manage and manipulate information from secondary storage devices.

F. Knows strategies for acquiring information from electronic resources (e.g., encyclopedias, databases, libraries of images, reference software, Internet).

G. Knows search strategies (e.g., keyword, Boolean, natural language) for locating and retrieving information in electronic formats (e.g., text, audio, video, graphics).

H. Knows how to assess the accuracy and validity of acquired information.

I. Knows how to resolve information conflicts through research and comparison of data from multiple sources.

J. Demonstrates knowledge of the ethical acquisition (e.g., citing sources using established methods) and acceptable vs. unacceptable use of information (e.g., privacy, hacking, piracy, vandalism, viruses, current laws and regulations).

K. Demonstrates knowledge of intellectual property rights and related issues (e.g., copyright laws, fair use, patents, trademarks) when using, manipulating and editing electronic data.

L. Knows how to use online help and other support documentation.

M. Knows how to use technical-writing strategies to develop documentation for a variety of communication products.

N. Demonstrates knowledge of the impact of Technology Applications on society and the importance of technology to future careers, lifelong learning and daily living for individuals of all ages.

Competency 002: *The Technology Applications teacher knows how to use technology tools to solve problems, evaluate results and communicate information in a variety of formats for diverse audiences.*

The beginning teacher:

A. Knows how to plan, create and edit documents using word-processing features (e.g., readable fonts, alignment, page setup, tabs, ruler settings) to solve problems and communicate results.

B. Knows how to plan, create and edit spreadsheets using spreadsheet features (e.g., data types, formulas, functions, charts) to solve problems and communicate results.

C. Knows how to plan, create and edit databases using database features (e.g., defining fields, entering data, horizontal and vertical layouts) to solve problems and communicate results.

D. Knows how to integrate two or more objects (e.g., tables, charts, graphs, graphics) into a product.

E. Knows how to use productivity tools to create products (e.g., slide shows, posters, multimedia presentations, spreadsheets) for defined audiences.

F. Knows how to publish information in a variety of ways (e.g., printed copy, monitor displays, Internet documents and video).

G. Knows how to use telecommunications tools (e.g., Internet browsers, video conferencing, distance learning) for a variety of purposes.

H. Knows how to use interactive virtual environments (e.g., virtual field trips, instructional simulations).

I. Knows how to use collaborative software.

J. Knows how to share information through online communication.

K. Demonstrates knowledge of issues concerning proper etiquette when communicating using electronic tools.

L. Demonstrates knowledge of how to design and implement procedures to track trends, set timelines and review and evaluate products using technology tools (e.g., database managers, daily/monthly planners, project management tools).

M. Knows how to evaluate projects for design, purpose, audience and content delivery using various criteria (e.g., technology specifications, established criteria, rubrics).

N. Knows how to select representative products to be collected and stored in an electronic evaluation tool and how to evaluate products for relevance to the assignment or task.

O. Knows how to plan and design communication products that are accessible to learners with diverse needs and abilities.

Competency 003: *The Technology Applications teacher knows how to plan, organize, deliver and evaluate instruction that effectively utilizes current technology for teaching the Technology Applications Texas Essential Knowledge and Skills (TEKS) for all students.*

The beginning teacher:

A. Knows how to plan applications-based technology lessons using a range of instructional strategies for individuals and small/whole groups.

B. Demonstrates knowledge of issues related to the equitable use of technology (e.g., gender, ethnicity, language, disabilities, access to technology).

C. Knows how to plan and implement instruction that allows students to use technology applications in problem-solving and decision-making situations.

D. Knows how to develop and facilitate collaborative tasks and teamwork among group members.

E. Knows how to use technology tools to perform administrative tasks (e.g., attendance, grades, communication).

F. Knows how to use a variety of instructional strategies to ensure students' reading comprehension.

G. Knows strategies to help students learn how to locate, retrieve, analyze, evaluate, communicate and retain content-related information.

H. Knows how to evaluate student projects and portfolios using formal and informal assessment methods.

I. Knows the relationship between instruction and assessment and uses assessment results for gauging student progress and adjusting instruction.

J. Identifies resources to keep current with the use of technology in education and issues related to legal and ethical use of technology resources.

K. Knows how to use technology to participate in self-directed activities in society and how to participate within electronic communities in a variety of roles (e.g., as collaborator, learner, contributor, teacher/mentor).

DOMAIN II — DIGITAL GRAPHICS/ANIMATION AND DESKTOP PUBLISHING

Standards Assessed: Technology Applications 8–12 VII–VIII

Competency 004: *The Technology Applications teacher demonstrates knowledge of the principles of design and their application to digital graphics/animation products.*

The beginning teacher:

A. Knows concepts and terminology related to digital graphics (e.g., pixels, resolution, file types).

B. Demonstrates knowledge of the rules of visual composition (e.g., rule of thirds, golden section) and how they relate to harmony and balance.

C. Knows how to apply basic design principles (e.g., proportion, balance, variety, emphasis, harmony, symmetry, unity) in type, color, size, line thickness, shape and space.

D. Demonstrates knowledge of the use of repetition (e.g., shape, texture, spatial relationships, line thickness, size) to develop organization and strengthen the unity of a product.

E. Demonstrates knowledge of the use of perspective (e.g., background, light, shade/shadow, scale) to capture a focal point and create depth.

F. Knows how to create three-dimensional effects using foreground, middle-distance and background images.

G. Demonstrates knowledge of the use of pictorial qualities in a design (e.g., shape and form, space and depth, pattern and texture) to create visual unity and desired effects.

H. Uses fundamental concepts of graphic design (e.g., composition and lighting, point of interest, attributes that determine prominence and support the subject) to analyze and evaluate digital graphic and animation products.

I. Identifies and selects appropriate uses for process color, spot color and black and white.

J. Identifies and distinguishes between RGB and CMYK color formats.

K. Demonstrates knowledge of color mixing theories and knows how to apply these theories to create new colors in digital format.

L. Knows how to apply a variety of color schemes (e.g., monochromatic, analogous, complementary and cool and warm colors; primary/secondary triads; split complements) to digital designs.

M. Knows how to apply color principles to communicate the mood of a product for a specific audience.

Competency 005: *The Technology Applications teacher demonstrates knowledge of principles of typography and page design and knows how to use technology tools to create desktop publishing products.*

The beginning teacher:

A. Knows concepts and terminology related to desktop publishing (e.g., leading and kerning, widows and orphans, text wrap, automatic text flowing into linked columns).

B. Knows digital keyboarding standards (e.g., the use of em and en dashes, smart quotation marks).

C. Identifies the tasks in a project and knows how to use the tools (e.g., word processing, pagination, utility, indexing, graphics, drawing) necessary to complete those tasks.

D. Knows how to integrate information from productivity tools (e.g., text, database, spreadsheet, graphic files) into desktop publishing products.

E. Knows how to import and export text and other elements from one program to another and understands editing operations and functions (e.g., cut, copy, paste).

F. Applies the basics of type measurements for inches and picas.

G. Demonstrates knowledge of the appropriate use of type (e.g., font, size, style, alignment, category) for a specific task.

H. Knows how to use type techniques (e.g., drop cap, decorative letters, embedded-text frames) as graphic elements.

I. Distinguishes between typefaces and recognizes and resolves conflicts that occur from combined usage.

J. Identifies the parts and kinds of pages (e.g., inside and outside margins, gutter, title page, inside pages).

K. Knows how to use a variety of strategies (e.g., varying line widths and patterns; manipulation tools to stretch, bend, screen, rotate, follow a path, and mirror type) to create effective designs.

L. Knows how to use styles (i.e., style sheets), including a variety of type specifications (e.g., typeface, size, alignment, indents, tabs, paragraph formatting).

M. Knows how to create a master template to include page specifications and other repetitive information and tasks.

N. Knows how to incorporate the elements of page design (e.g., text, graphics, headlines, alignment) into a desktop publishing document using basic design principles (e.g., balance, contrast, dominant element, use of white space, consistency, repetition, alignment).

Competency 006: *The Technology Applications teacher knows how to use graphics, animation and desktop publishing software to produce products that convey a specified message to an intended audience.*

The beginning teacher:

A. Analyzes appropriate applications of bitmapped and vector graphics.

B. Knows how to work in bitmapped and vector modes to create graphical images (i.e., backgrounds, characters and other objects).

C. Knows how to use a variety of editing tools to modify graphic files.

D. Knows concepts and terminology related to computer animation (e.g., storyboarding, timeline, color depth, layers, animated GIFs, frames, keyframes, tweening, object behaviors).

E. Uses appropriate applications of path- and cel-animation techniques.

F. Uses appropriate scripting languages to create an animation or movie.

G. Identifies and defines the design attributes and requirements of products created for a variety of purposes (e.g., posters, billboards, business cards, stationery, brochures, magazines, multimedia, Web pages).

H. Demonstrates knowledge of design and printing requirements as they relate to purpose, audience and final output and knows how to create technology specifications for tasks.

I. Knows how to use content selection and presentation to ensure that products are appropriate for the defined audience and communication purpose.

J. Knows how to synthesize information from data gathered from interviews and print and electronic resources.

K. Knows how to use proximity and alignment to create visual connection with other elements and how to use lighting techniques (e.g., shadows/shading) to create an effect.

L. Knows how to use a variety of printing options (e.g., tiling, color separations, collation, previewing) and demonstrates knowledge of issues related to publishing information in a variety of formats.

M. Knows how to evaluate desktop publishing, digital graphics and animation products for design, content delivery, purpose and audience.

N. Demonstrates knowledge of the impact of desktop publishing on society, including concepts related to persuasiveness, marketing, and point of view.

DOMAIN III — VIDEO TECHNOLOGY AND MULTIMEDIA

Standards Assessed: Technology Applications 8–12 IX–X

Competency 007: *The Technology Applications teacher knows how to produce and distribute digital video and multimedia products.*

The beginning teacher:

A. Knows the roles and jobs of a production crew for digital video projects (e.g., executive producer, producer, director, engineer, script writer, editor, camera operator, presenter, audio technician).

B. Knows the roles and jobs of a production crew for multimedia projects (e.g., project manager, lead programmer, writer, art director, editor, sound engineer, researcher, animator, presenter).

C. Knows how to address issues related to the planning and preproduction stages (e.g., storyboarding, script writing, producing, contracting, scheduling, site surveying, obtaining necessary permits and release forms) of a video project.

D. Demonstrates knowledge of issues related to creating video products for a variety of purposes and audiences.

E. Applies strategies of script writing to create a visual communication product.

F. Knows how to use productivity tools and programs (e.g., word processor, database, spreadsheet, draw/paint, utility) in creating, modifying and solving problems in digital video and multimedia products.

G. Knows how to use camera perspective, content selection, presentation and graphic design (e.g., font attributes, color, white space, graphics) in digital video and multimedia products appropriate for the defined audience and purpose.

H. Knows how to evaluate video technology projects for design, content delivery, purpose and audience.

I. Knows how to publish using a variety of video technologies (e.g., Internet, television, CD-ROM, DVD, videotape).

J. Knows how to determine the best method of distribution, the number of finished copies needed and the most appropriate method for promoting a video technology or multimedia product.

Competency 008: *The Technology Applications teacher demonstrates knowledge of strategies and techniques used in the preproduction, production and postproduction of video products.*

The beginning teacher:

A. Knows basic concepts of video filming (e.g., composition, ratio of image to frame, position in frame, line of gaze, pan/tilts, movement, perspective).
B. Knows a variety of basic camera techniques (e.g., zoom, focus, iris control, white balance, filters).
C. Applies lighting techniques (e.g., key, fill, backlight) and knows how to use incident/reflected light, color temperatures and filters.
D. Understands basic video-shot vocabulary (e.g., long shot, medium shot, extreme close).
E. Identifies and knows how to create and use a variety of video objects (e.g., text, image, video, audio, animation).
F. Knows how to use audio techniques to create, edit and integrate digital sounds.
G. Demonstrates knowledge of compression schemes for outputting a variety of file types (e.g., MPEG, AVI, MOV), and knows strategies to conserve memory and retain image quality.
H. Knows basic concepts and terminology related to video technology (e.g., analog, digital, codec, drop-frame, resolution).
I. Knows differences and similarities between linear and nonlinear editing.
J. Knows a variety of input devices related to video technology, and knows how to output digital video to analog and analog video to digital.
K. Demonstrates knowledge of techniques used in postproduction (e.g., editing and creating control and/or time-coded tracks; creating transitions, captions and titles; setting audio levels; adding background music and special sound effects; applying 2-D and 3-D animation effects).

Competency 009: *The Technology Applications teacher knows how to design, produce and distribute multimedia products.*

The beginning teacher:

A. Knows basic concepts and terminology related to multimedia (e.g., flowcharts, morphing, anti-aliasing).

B. Knows how to use a variety of multimedia programs and tools (e.g., linear/nonlinear authoring, image/video editing, draw/paint/text creation).

C. Knows the appropriate use of digital imaging, video integration and sound in a multimedia product and knows how to import a variety of file types (e.g., sound, graphic).

D. Knows how to implement methods to create interactivity in a multimedia project.

E. Differentiates among and knows how to appropriately use 3-D modeling, animation and rendering software.

F. Knows how to import video into digital format and how to digitize analog audio using different sound rates, resolutions and channels.

G. Knows the appropriate use of animation and multimedia software components (e.g., control panel, stage, score, cast, timeline).

H. Knows how to use path- and cel-animation modules and applies appropriate scripting language to create a multimedia sequence.

I. Differentiates among types of audio input, and knows how to use a variety of techniques to edit, manipulate and change sounds (e.g., adding effects, manipulating waveforms).

J. Knows how to format a multimedia project according to defined output specifications (e.g., target audience, viewing environment), and knows how to publish a multimedia product in a variety of formats.

DOMAIN IV — WEBMASTERING

Standards Assessed: Technology Applications 8–12 XI

Competency 010: *The Technology Applications teacher demonstrates knowledge of strategies and techniques for website administration.*

The beginning teacher:

A. Knows concepts and terminology related to Web administration (e.g., URL, IP addresses, HTML, data transfer).

B. Demonstrates knowledge of similarities and differences among networks (e.g., LAN, WAN, the Internet, intranet).

C. Knows methods for navigating and for accessing information from networks (e.g., LAN, WAN, the Internet, intranet).

D. Demonstrates knowledge of the technical requirements for a Web server and resolves issues relating to compatibility (e.g., file formats, cross-platform connectivity).

E. Knows the historical development and characteristics of a variety of network protocols and knows methods of accessing information on the Internet (e.g., HTTP, FTP, TCP/IP, Telnet, Gopher, WAIS).

F. Knows issues related to network security and knows how to select and implement methods to protect a Web server from unauthorized use and negative intentions.

G. Knows how to establish a folder/directory hierarchy for storage of Web pages and their related files.

H. Knows how to control access to a website via password controls and global access/deny controls.

Competency 011: *The Technology Applications teacher knows principles of Web page design and uses a variety of tools and techniques to design and troubleshoot Web pages for a diverse audience.*

The beginning teacher:

A. Knows how to create Web pages using text-based and graphical-based editing programs.

B. Knows how to integrate information from productivity tools (e.g., database, spreadsheet, graphics files) into Web pages.

C. Demonstrates knowledge of issues related to incorporating graphics, video, audio and multimedia sequences into a Web page.

D. Demonstrates knowledge of website concepts and issues relating to usability (e.g., color scheme, site organization, navigation, frame size, type of file).

E. Demonstrates knowledge of design principles (e.g., size of graphics, font size and color, backgrounds, ratio of text to white space) and page elements (e.g., hyperlinks, HTML tags, tables) used in creating Web pages.

F. Demonstrates knowledge of issues related to displaying Web pages on a variety of browsers and monitors (e.g., color, page size, browser version, plug-ins).

G. Knows how to plan and design Web pages that are accessible to diverse audiences (e.g., visually impaired, learning disabled, physically disabled).

H. Knows how to identify potential problems with a Web page and applies a variety of troubleshooting techniques to identify and correct problems.

Competency 012: *The Technology Applications teacher knows how to use Web pages to communicate and interact effectively with others.*

The beginning teacher:

A. Knows how to format digital information for appropriate and effective communication (e.g., appropriate use of hyperlinks, use of high-impact graphics versus text-only pages, designing content for a specific audience).

B. Knows how to implement methods for creating interactivity in Web pages.

C. Knows how to synthesize and generate new information from data gathered from electronic and telecommunications sources.

D. Knows how to create instructions for student tasks and rubrics to evaluate a communication project.

E. Knows how to extend teaching and learning in the local environment to the worldwide community through the creation and sharing of Web documents.

F. Demonstrates knowledge of strategies for extending the learning environment beyond the classroom through the creation and sharing of electronically formatted and published documents via electronic networks.

G. Knows the effects of the World Wide Web on society (e.g., information sharing, distance learning, the commercial sector).