Pass the TExES Technology Applications EC-12

FOR TEXAS TEACHERS. A test prep manual for Technology Applications exam #142 for grades EC-12.

SEMINAR/TUTORING AVAILABLE!

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Also available from Ed Publishing: Pass the TExES PPR
Domain I:
Technologies Applications Core
Competencies 1-3
(20% of the test)

Technology Applications 8–12 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 8–12 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 8–12 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 8–12 Standard IV:
All teachers communicate information in different formats and for diverse audiences.

Technology Applications 8–12 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.
1. Technology Overview

Key Descriptors:

- Understands technology terminology
- Knows the appropriate uses for hardware and software
- Appreciates the broad range of peripherals and their uses
- Evaluates software applications for their intended uses
- Knows how to search for and evaluate digital information
- Demonstrates knowledge of using digital information ethically, including copyright law

Key Words:

- Hardware Components
- Operating Systems
- Software Applications
- Network Components
- Peripherals
- Boolean Search
- Fair Use

NOTE: Refer to the bullet points under each Competency in the ETS/SBEC study guide. On the lines above paraphrase each bullet point using a short phrase that is meaningful to you.
1. Technology Overview

Competency 1:
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.

A. TERMINOLOGY AND CONCEPTS
Technology changes daily. The terminology and concepts of technology can change that rapidly also. This guide will contain current information on terminology and concepts throughout to help you pass the TExES.

1. HARDWARE COMPONENTS
Hardware components are the physical aspects of the computer. Some are visible and some are not. Here are some of the hardware components of a typical computer:

a. Input Devices – Input devices are used to get data or information into the computer. Examples of standard input devices include the keyboard and the mouse. However, there are other input devices such as drawing pads. Some input devices are also output devices, such as CD-ROMs.

b. Processing Devices – Processing devices allow the computer to process the data. Processors include the chips or components that determine the speed of the computer. In computer specifications, the processor might be listed as 2.8 GHz Intel Pentium 4.

c. Output Devices – Output devices get data or information out of the computer. Some devices only output information, such as a printer. Other devices are also input devices, such as hard drives.

d. Storage Devices – Storage devices hold data. Primary storage devices include the computer’s hard drive. Secondary storage devices include CD-ROMs and flash drives.

2. OPERATING SYSTEMS
An operating system is the first software loaded on a computer. It manages all the software applications and determines which applications take priority, manages memory requests, and communicates with input and output devices. Examples of operating systems include Linux, Windows XP and Macintosh X.

3. SOFTWARE APPLICATIONS
A software application performs a specific task for the user. An operating system is one example of a software application. Other software applications are used for word processing, spreadsheets, games, simulations and more. Typically, software applications are loaded onto a computer via a CD-ROM or through download from the Internet.

4. NETWORKING COMPONENTS
A network is simply connections of computers. At a minimum, there are two computers and some type of connection, such as wire. Most networks are larger than this and can include many computers, servers and a lot of wire. Networks can also include routers, hubs and wireless capabilities.

B. APPROPRIATE USE OF HARDWARE, SOFTWARE AND DIGITAL FILES
Computers are quite useful in and of themselves, but many times other devices are necessary for a task. So, it is important to know how to select, connect and use a variety of devices.

1. PERIPHERALS
a. Scanner – A scanner is an input device that can capture hard copy images or text and translate them into a digital form. Once they are in digital form, they can be saved, manipulated, and sent to other computers.

   • Select: To select a scanner, it is important to understand what needs to be accomplished. Scanners have a number of options, but the most important one
that affects the price is the resolution. The higher the resolution, the more detail the scanner captures and sends to the computer. Higher resolution files take up more disk space and require more processing power. High resolution files may not be necessary either. For example, most computer monitors can only display a resolution of 72 pixels per inch. So, if the scanner will be used only for work on a computer, a high resolution scanner might not be necessary.

• **Connect:** Most new scanners are connected via Universal Serial Bus (USB) cables. These connections allow plug-and-play, meaning that the scanner can be plugged in and immediately recognized by the computer. Other scanners require a parallel port similar to a printer. In this case, it is necessary to use a disk to load a driver on the computer. This driver informs the operating system of the scanner.

• **Use:** Scanners will vary, but typically they are easy to use. Most have buttons on the scanner to start the process. Then, it is simply a matter of using the software that came with the scanner to make selections. Often, the most important selections are the amount of detail (or pixels per inch) and whether it should be scanned in color or black and white.

b. **Voice/Sound Recorder** – A voice or sound recorder will take sound and digitize it so that it can be stored and manipulated on the computer. Most often, these recorders will be a microphone. Some computers have microphones built in.

• **Select:** Microphones can range in price from very inexpensive to very expensive. The inexpensive microphones have good quality, but a high quality microphone might be necessary for studio like sound.

• **Connect:** To connect a microphone, look for the small round connection. Most computers have a small picture of a microphone next to the connection.

• **Use:** Microphones are used with a variety of software. Some word processors have speech recognition abilities that can be used with microphones. Other software is more specialized such as Windows Media Player or GarageBand. Each software package is unique and some might require that the microphone is set up in the preferences area. Refer to the user’s manual for the software to determine the process if the microphone is not immediately recognized.

c. **Touch Screen** – A touch screen is a display that responds to the touch. It is used for people who might have issues with a keyboard and mouse or for some types of training modules. These displays can include a panel that is mounted over the monitor or it can be a stand alone monitor.

• **Select:** One of the main issues for touch screens is to review its durability. Some touch screens become less sensitive over time. Also, touch screens can wear over time if one area is used more than another.

• **Connect:** Touch screen panels are mounted on the front of the monitor and then plugged into the computer using a USB connection. Software must also be loaded for the touch screen to properly function. Stand alone touch screen monitors are connected in the same manner as any other monitor.

• **Use:** When using touch screens, it is important that students have clean hands. They should also use a moderate touch to extend the life of the screen.

d. **Digital Camera** – A digital camera takes photographs in digital format. Many digital cameras have a small Liquid Crystal Display (LCD) screen on the back to view the picture. Many people enjoy digital cameras because it allows them to store, manipulate
and print their pictures from their computers.

- **Select:** Digital cameras vary widely in price and features. The main price variable is the resolution, which is usually denoted in megapixels. For example, a camera might advertise that its resolution is three megapixels. This means that the digital photograph has three million pixels in a picture. Similar to scanners, if all of the pictures will be displayed on a computer, there is little need for a camera with high resolution. However, if the photographs will be printed and used in a graphics design course, a higher resolution camera may be necessary.

- **Connect:** Most new scanners are connected via Universal Serial Bus (USB) cables. These connections allow plug-and-play, meaning that the scanner can be plugged in and immediately recognized by the computer. Other scanners require a parallel port similar to a printer. In this case, it is necessary to use a disk to load a driver on the computer. This driver informs the operating system of the scanner.

- **Use:** Scanners will vary, but typically they are easy to use. Most have buttons on the scanner to start the process. Then, it is simply a matter of using the software that came with the scanner to make selections. Often, the most important selections are the amount of detail (or pixels per inch) and whether it should be scanned in color or black and white.

e. **Printer** – Printers are an essential output device. One printer can output text or images in color or black and white.

- **Select:** Essential aspects of printers include their speed, text quality, cost per page and, if necessary, photo quality.

- **Connect:** Many new printers will connect using a USB port. Other printers use a parallel port. Printers also require software drivers installed on the computer.

- **Use:** Printers can be used from most applications. There is a print dialog box that offers a choice of printers, number of copies to print and more.

2. **SOFTWARE EVALUATION**

Software evaluation is an important skill for technology experts. The main point to remember is to begin with the end in mind. Know the purpose of using the software. Then there are a few aspects to keep in mind as you review the software.

**Quality** – High quality software is a must in schools. Look for the content first. Is it pedagogically sound? It is important that the software helps the students learn in a positive environment. Most districts have content area specialists that can help in this area. Also ensure the software has good user interface design, high quality graphics and good sound.

**Appropriateness** – All software must be reviewed to ensure the content, graphics and sound is appropriate for the students. The age of the students is a determining factor for appropriateness, as is gender. Inappropriate software can not only derail good learning, it can be detrimental to students. If there are questions about its appropriateness, it is best not to approve the software.

**Effectiveness** – Many companies that develop and sell educational software will claim that it is effective. Obviously, it is important to corroborate that claim. Look for independent studies that test the software. If no studies are available, ask colleagues in other districts. If the software title is new, evaluate whether the company’s previous software titles have been effective. As a last resort, field test the software on a small group of students and monitor its effectiveness.

**Efficiency** – Some software will not necessarily increase efficiency as it is not designed for that purpose. Most productivity tools, such as word processors or spreadsheet software, will increase
efficiency for the students. This is an area where understanding the purpose of the software is important. Again, start with the end in mind. If a teacher is interested in increasing his or her student’s efficiency then this is an important aspect to research.

After software is evaluated and approved, it must be purchased properly. There are serious financial ramifications for schools if software is not properly acquired and used. Most software companies are very clear about their licensing agreements. Typically, licenses can be purchased for the entire district, one school or one classroom. Purchase enough licenses for the instructional situation. Also, most licenses are for a certain amount of time or for a certain number of releases of the software. Do not allow computers to have outdated software as that could be a violation of the licensing agreement.

3. Performing Basic Application Functions
Knowing how to perform basic application functions often transfers to many different applications. There are several basic actions that can be performed in most applications:

Opening an Application – Many applications will have a desktop icon. Double-clicking on that icon will open the application. If there is no icon, go to Start -> All Programs on Windows or the pop up menu on a Macintosh.

Creating a Document – Once in an application, the first drop down menu has several standard features. One feature is “New” which will create a new document to work from.

Modifying a Document – Depending on the application, modification of a document can be as easy as typing some text.

Saving a Document – The “File” menu will have an option to save the document. Click on “Save as” if the document is been modified, but the original version must stay intact.

Printing a Document – Again, the “File” menu will have the option to print the document. It is important to know where printers are located, especially if the computer is networked to a number of printers.

If information and files are kept on a secondary storage device, such as a CD-ROM or a flash drive, make sure the storage device is connected or inserted into the computer. The files on the device can be opened from a related application. Also, you can access, manage and manipulates files using Windows Explorer or Finder on the Macintosh.

C. HOW TO ACQUIRE, ANALYZE, AND EVALUATE DIGITAL INFORMATION

1. SEARCHING FOR INFORMATION
Searching for information electronically can be daunting. There are many electronic resources and more become available daily. However, with some knowledge of searching strategies, locating relevant information is much easier. These search strategies can be used when looking for any type of electronic information.

Keyword searches – If there is an important word in the information needed, that word could be used as a keyword for a search. A keyword is simply a word and search engines on the Internet will look for that word in prominent places on web pages. While they are used most often, there are problems with keyword searches. An example of a problem is called stemming. Specifically, entering a keyword of “learn” may not bring results like “learning” or “learners.” Also, keywords do not look for synonyms. For example, searching for “learners” would not find documents that use the word “students” instead.

Boolean searches – Boolean searches allow for a more refined search. There are several Boolean