Train the Trainer Toolkit
Resources for developing trainings in Basic and Business Digital Literacy

PART IV. THE TRAININGS
SELECTING AND MAINTAINING A COMPUTER, MODULES 1-3

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SELECTING AND MAINTAINING MODULE 1:
User needs and standard computer requirements

Summary, challenges, and instructional strategies

This module reviews the key components of computers and the standard requirements needed for those components based on the user’s needs. The module first looks at the components and what they do before turning to users’ needs. The goal is to build enough understanding that students can become smart consumers and have a foundation from which to analyze the information and choose the right computer for them. The class builds confidence by using consumer and research sites that reiterate the information students have just learned, reinforcing learning through recognition and review.

The key challenge to the course is that technology changes rapidly, so the information and standards given in this module will become outdated quickly. Instructors should check figures for CPU, RAM, and hard drive capacity regularly, and review consumer websites each time before teaching, as layouts and menus change often as well.

Students who have taken the Basic Computer Skills classes will have seen this information before, but those who have not may be seeing it for the first time. Acknowledge this at the onset of class and set the pace that balances the differing knowledge bases most effectively.
New Mexico Broadband Program
Selecting and Maintaining a Computer
Module 1
Matching computer styles to user needs
Key components and standard requirements

Learning Outcomes
Understand your computer use needs
Match use requirements to standard specifications
Research computers on consumer research sites
Make smart choices in selecting a computer

When you have completed this module, you should be able to understand your computer use needs, match your requirements to standard specifications, research computers on a consumer or computer research site, and make smart choices about selecting a computer.
Computers are similar in many ways, but differ substantially in their size and their styles.

One of the largest computers is called a mainframe. These are large computers that can support many users and are held only by large organizations or businesses. Having a mainframe is a bit like having a server of your own. They are not practical for most people and not used much by everyday, casual users.

A desktop is a personal computer that sits on your desk. Different desktops models work with different operating systems and software, such as Windows or Macintosh.
Laptops have become the most popular personal computer model. They are easy to use, simple to set up, and the costs, which were once much higher than those of desktops, have come down. Laptops are more portable versions of a computer.

PCs and Macs are both made in laptop models and can run on batteries.

Tablets are the newest and fastest developing style of computer. Tablets have touchscreen access to all functions, including the keyboard.

We don’t always think of smartphones as computers, but they are rapidly coming to be used as computers more and more. People manage email, search the Internet, and run a variety of apps on their smartphones. Originally, smartphones were more like digital calendars. Now, Smartphones, such as iPhones, Blackberries, and Droids, are gaining capacity to function as computers. These phones can pick up both phone signals and wireless Internet signals. So you get two kinds of reception on a smartphone – phone signal and Internet signal.
A network is a group of computers that are connected with special cables so that they can share equipment (such as printers) and information (such as files).

A server is a central computer on which network users can save their files and information. Any type of computer can be networked, as long as it has the capacity to share information.

If you work in an office, you may be on a “network” in which you share files with other computers in the office. When you access billing or documents, you are all looking at the same set of files.

Those are the different types of computers.

But what are the key parts?
Computer parts can seem confusing, especially the first time we encounter them. But their function is straightforward. All basic computer parts help us access, use, or store information. Once you are familiar with computer parts, they feel as clear as the different parts of your office do now.

The Central Processing Unit (CPU) is one of the most important parts of the computer. It helps us access and use information and is often considered the “brains” of the computer.

The CPU is also known as the micro-processing chip. It performs calculations and retrieves information at very high speeds. The CPU is the “worker” in your computer, and generates a great deal of heat.
CPU Speed

- One of the most important factors used to determine a computer’s performance is the speed of the CPU.
- The speed of a CPU is measured in megahertz (MHz = $10^6$) and gigahertz (GHz = $10^9$).
- Standard speeds range from 2-8 GHz for modern systems.
- The higher the MHz or GHz number, the faster the computer will run.

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Hard Drive

- The Hard Drive holds all of the information that you routinely access. It works a bit like your filing cabinet or bookshelf.
- The larger the hard drive capacity, the more pictures, music and documents you can store.

The Hard Drive holds all of the information that you routinely access. It works a bit like your filing cabinet or bookshelf. The larger the hard drive capacity, the more pictures, music and documents you can store.

The hard drive is also the computer’s main, long-term storage location. The hard drive is one of the key features of the computer.
Slide 17

Most hard drives can hold up to 2 Terabytes of data. This is about equal to 200 million written pages. Sizes are increasing. We are also turning to the “cloud,” online storage locations, for storing some of our files, so hard drive size may not always keep on increasing.

Slide 18

A computer’s short term memory is called RAM, for “Random Access Memory.” RAM is a temporary memory, rather like the available work space or the room on your desk. The more RAM your computer has, the more work you can bring out at once.

Slide 19

RAM is an important factor in a computer’s performance. The more RAM a computer has, the greater its ability to “multi-task.” Think about it - a large amount of RAM is like having a very large desk – it allows you to work on more things at the same time because there is more space. So more RAM means you can work on more things at one time – you can check email, open files, play music, create videos, and browse the web.
RAM memory is held on DIMMs (dual in-line memory modules). DIMMs are complex circuit boards that are installed inside your computer. You can usually add memory by adding DIMMs to empty slots inside your computer case.

When you use a computer, you take the items out of the file cabinet (hard drive) and work with it in your computer’s memory (RAM). When you are done, you store your work back in the file cabinet (hard drive), where it can be retrieved later.

The different pieces of the computer are all wired together on a motherboard. The motherboard is a central circuit board. It supplies power and connects the different parts of the computer to each other.
Remember, computers help us store information.
If we store it in the computer, it will be stored in our hard drive. This is like keeping it in our office or file cabinet.

We can also store information on external storage devices that hold information in digital form. We can use them to take information with us, just as we take files with us in a briefcase.

These portable storage devices hold information in the same way that CDs hold music or DVDs hold videos.

You can use computer CD disks to store information from your computer. Each CD can hold around 700 megabytes of data. CDs are the best form of storage for if you want to save the information in a permanent, lasting format.
A flash drive is another device used for storing information. Flash drives are also called thumb drives, jump drives, USB drives, and sticks. Flash drives allow you to transfer information from one computer to another quickly and easily. A flash drive can hold up to 64 Gigabytes. This is equal to about 13,000 photos.

This is an external hard drive. You can use it to store large amounts of information. External hard drives are more expensive than CDs or flash drives but almost as portable. They usually plug into a USB port on a computer. An external hard drive can hold as much data as an internal hard drive, currently one terabyte.

Knowing the basic parts of a computer is useful when you get ready to select and purchase one for your own use. Your understanding will help you be a well-informed consumer.
You can break the decision process down into a few simple steps. First – consider computer type. If your computer work will be in one location, a desktop computer may be your best choice. This is often true for office computers and those used in at-home offices.

Desktop systems offer the option of a larger monitor screen. Larger monitors cost more, but allow easy viewing of text, movies and games. The large screen also eases eye strain and can reduce eye fatigue for people who work on computers all day.

A desktop model generally offers greater system capacity. In this image, you can see the difference in physical size between the hard drive from a desktop and from a laptop. The smaller size of the laptop's hard drive means that it can store less information.
A desktop will also tend to have more RAM, or Random Access Memory.

This means it will be easier for you to open several programs at once on a desktop, since you will have more “space” to work with.

Let’s review and compare:

A desktop system offers advantages and disadvantages over a laptop system.

**Advantages**
- Good capabilities
- Range of monitor sizes
- Generally lower cost
- Maintain and replace peripherals separately

**Disadvantages**
- Not transportable
- Maintain and replace peripherals separately

If you need something that is easy to carry from place to place, but still has full computer functionality, your best bet would be a laptop. Laptops are smaller and lighter than desktops and are easy to move from location to location.
However, laptops have less storage and processing capacity than desktops. Laptops are a good choice if you travel often, frequently need to access your files from different locations, or have no need for higher functionality. The price of computers continues to decrease, and laptops and desktops are comparable in pricing.

Tablets are smaller and lighter than laptops and are great for content viewing. You can watch movies, listen to music, read books, and browse the Internet easily on a table style computer.

Using a tablet computer to produce work, such as documents, videos, music, or photos, is more difficult. Tablets do not have full functionality for production of work. The reduced capacity and the touchscreen keyboard limit tablets for this purpose.
Laptops typically have most of the same components as a desktop and can run most of the same software. Laptops are convenient for business people on travel or students. Laptops take up little room when in use and allow easy mobility and storage. Laptops are generally more expensive than most desktops.

The next thing to consider in selecting a computer is the type of tasks for which you will be using it.

Instructor:
This is a good question to ask the class and discuss. It will help them understand what general range of requirements and standards they will need to consider.
Different tasks require different levels of overall system performance.

Writing emails or doing home, school, or business paperwork requires the lowest level of performance.

Extensive Internet browsing or using the computer for entertainment requires a slightly higher level of performance.

Gaming almost always requires the most system resources and the highest level of performance. It also generally requires special system items, such as a high quality graphics card. Other tasks that require high performance are graphic intensive software applications or tasks, such as photography programs and drafting programs.
Now we that you have determined what tasks you want to perform, you need to put this together with information about hardware to determine your system requirements.

The main system components to consider are the processor, the memory, and the hard drive. These will determine the speed and overall performance of your computer.

Remember: the Central Processing Unit (CPU) is the micro-processing chip. It is the “worker” of a computer. This part of the system determines the speed with which the computer will run.

For most uses, you will probably need a CPU of at least 2.8 GHz (Giga Hertz). Many computers now come with “dual core” processors that add speed.
Remember: RAM (Random Access Memory) is the part of the computer that holds the instructions for performing our tasks as well as the data we are currently working on. A high CPU speed is useless without adequate RAM to help it hold the information it needs to function. The more RAM that your computer has, the faster it will run and the more complex functions it will perform.

RAM is measured in Gigabytes (GB) or terabytes (TB). The more RAM that you can afford the better. Generally, for most overall computer functions, you will need about 3 GB or RAM. Many lower-cost laptops offer 4 GB of RAM.

If you change the speed of the CPU or the RAM, make sure they are well matched. Check with your salesperson or technician to ensure one does not outweigh the other.
Remember: the Hard Drive holds all of the information that you routinely access and use for everyday use. It works a bit like your filing cabinet or bookshelf. The larger the hard drive, the more pictures, music and documents you can store. 250-350 GB is good; 500 GB is rich.

The hard drive should be as large as you can afford. Hard drives can also be replaced with larger hard drives. You can also add a hard drive, if you run out of room on the original one. In addition, many users are now using cloud locations for storage, that make hard drive size less critical, since files can be stored offsite, on an online location.

What else is important in selecting a computer?

Learn from others: ask family, friends, co-workers. This is very helpful. Do some research. Check prices at several places. Match prices and functions. Cut price with style rather than capacity.
Instructor:
You should review the site and develop a specific path on which to lead students. Do not simply have them roam the site, as it is easy to get lost. Direct them through as you project the screen from your own laptop. Be prepared for some students to get lost – but it is worth the occasional confusion.

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Instructor:
There are special sections in cnet reviews that deal with certain kinds of computers, such as laptops. Having students read these after they have heard the information in class provides an excellent review for them. If you are training in a library, Consumer Reports, which usually requires a subscription, may be available for free through one of the library databases.

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Software typically runs several years behind the hardware, so note the system requirements of any software you are considering purchasing. This is important. You do not want to buy a computer with inadequate speed to handle the software you will be using!!
It is said that technology becomes obsolete every 18 months. Protect yourself from this trend by getting a system that exceeds the recommended requirements by a small margin. This will ensure that your system will almost certainly meet your needs for at least 3 to 5 years.

If you use computers a lot, you will be ready for an upgrade by then!!

Most importantly, find a local tech support person who will work with you. No matter how much you learn, there are always things that come up which you do not know. Having reliable live tech support that can help you with simple issues and answer questions is invaluable. Often, if you buy from a local business, this business will supply some technical support.

Review

- Styles and parts of a computer
- Assessing your computer use needs
- Matching use and system requirements
  - Researching

Review what we learned

Styles and parts of a computer
Assessing your computer use needs
Matching use and system requirements
Researching
We appreciate the time you spent with us.
We hope to see you at the next training!

These materials were created collaboratively by the
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National Telecommunications and Information Administration.
These materials are not to be used for profit.

Connecting you to a world of opportunities

Demonstration Training Video
Handout

SELECTING AND MAINTAINING A COMPUTER– MODULE 1

Desktop  Largest of the PCs, which has a separate system unit, keyboard, monitor, and mouse.

Laptop  Portable computer in which keyboard, monitor, and mouse are all built into the unit.

Tablet  A smaller, portable computer in which a touchscreen keyboard is built into the monitor to form a single screen for viewing and interaction. Useful for viewing information, but not powerful enough to function as a producer.

Smartphone  The generation of cell phones that include extended computer capability. They can receive both phone and Internet signals, allowing access to email, Internet browsing, and other computer functions. They are often able to connect to Internet signals in remote locations, making them useful tools for people in remote areas.

CPU  The central processing unit, also known as the microprocessor, microprocessing chip, or chip, the CPU is commonly considered to be the “brains” of the computer. It is the device that makes the calculations in the machine and physically executes the many operations needed in order to make the computer run and applications perform.

Hard drive  The physical unit on your computer on which information is stored and from which it is retrieved. The hard drive operates by writing and reading onto electronic disks. Hard drives hold both the operating system instructions and application software instructions, as well as the files and photos we create and the movies or videos we save on our computers.

RAM  RAM, or Random Access Memory, is more like useable desk space than like human memory. RAM is a kind of temporary memory, or storage, that holds the programs, files, and websites that we open or use in a single work session. It is the location in which we open our operating system when we turn on the computer and that holds our files when we are working on them. When the computer is closed down, files and software are stored on the hard drive, and the RAM is left empty.

Portable storage devices  These include CDs, flash drives, and portable hard drives, all of which allow the user to store information on devices outside the computer system unit and hard drive.

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>MINIMUM REQUIREMENTS</th>
<th>ADDITIONAL COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU</td>
<td>2.8 gHz (giga Hertz)</td>
<td>Most processors are now dual core</td>
</tr>
<tr>
<td>RAM</td>
<td>3-4 GB (gigabytes)</td>
<td>Most RAM can be upgraded by adding DIMMs</td>
</tr>
<tr>
<td>HARD DRIVE</td>
<td>250-350 GB (gigabytes)</td>
<td>As cloud storage develops, hard drive space requirements will be less significant.</td>
</tr>
</tbody>
</table>

Dell.com reviews.cnet.com consumerreports.org
SELECTING AND MAINTAINING A COMPUTER
MODULE 1 – ASSESSMENT

1. Of desktops, mainframes, laptops, and tablets, which style of computer is the most popular for basic, standard range, computer functions?

2. A smartphone can pick up a wireless phone signal, but cannot pick up a wireless Internet signal.
   True          False

3. Briefly, what role or function does the CPU (central processing unit, or microprocessing chip), serve in a computer? That is, what does it do?

4. Briefly, what role or function does the hard drive serve in a computer? That is, what does it do?

5. RAM (Random Access Memory) is most accurately compared to:
   a. Human memory   b. a very fast calculator   c. a desktop

6. Name two portable storage devices.

7. What are some of the advantages and disadvantages of desktop and laptop models?

8. What are three important factors to consider when selecting a computer for purchasing?
SELECTING AND MAINTAINING MODULE 2:
Setting up a computer and connecting to the Internet

Summary, challenges, and instructional strategies

This module focuses on the practical tasks of setting up a computer at home and hooking it up to the Internet. As computers change and become increasingly “out of the box” ready to use, the first section of this module may decrease in emphasis and the latter section increase in importance. And as tablet computers gain in popularity, the tasks of activating apps or synching iPhones may become important enough to include in this module. Alternately, if your audience is one that may be acquiring refurbished computers, discussing older setting up techniques may remain of value. In other words, this is a module that may undergo considerable adjustment in order to have it suited best to your audience.

On the other hand, broadband access and the economics of this issue can be charged topics for many audiences and many communities. As an instructor, it helps to be supportive of your audience while still keeping the conversation from becoming overly charged or politicized. Keep responses solution-oriented and forward-thinking. As expensive as good connectivity and a good computer system are, there are many more programs providing lowered rates, refurbished equipment, and other opportunities for facilitating access and fair use.
Selecting and Maintaining a Computer  Module 2

By the end of this module, you should:
Know how to set up a computer
Know how to get connected to the Internet
Know how to select an ISP
First, we’re going to consider how you would set up a new computer.

Have a look around the area of the room where you intend to set up the computer. You want to be sure that there is at least one electrical outlet nearby. Also take note of the light; if you’re setting up near a window, try to arrange the monitor so that it faces away from the window. This will prevent glare.

If you are setting up a desktop, not all locations will be conducive to computer use. Try to be realistic.
Slide 6

Carefully remove all components from the box or boxes.
If the room where you’re unpacking the components is carpeted, be aware that you may be generating static electricity.

Slide 7

Use the packing list or setup guide included in the box to take an inventory of each component.
Make sure that you have all the components and all the necessary cables.
It’s a good idea not to throw anything away until you have completed the hook up and everything is operating smoothly.

Slide 8

If you have a desktop, position the system unit on your table or desk.
You can also position the system unit underneath the desk.
Leave at least a foot of space behind the system unit for ventilation.
Slide 9

Before you start plugging things in, take a moment to familiarize yourself with the ports on your computer.

Ports are the locations at which you will plug in the peripherals.

Slide 10

On a desktop model, PS/2 ports are sometimes used for a mouse and a keyboard.

Note that PS/2 ports are color-coded: the mouse is green and the keyboard is purple.

Most of these ports have been replaced by USB ports, but a parallel port is sometimes still used for printers.

There are also many wireless keyboards and mice now, that do not need hook up at all.

Slide 11

Laptop ports can look a bit simpler, depending on the model.

Laptops use USB ports for connecting a separate mouse and monitor.
Slide 12

Connect your mouse and keyboard to the tower first. Be sure to match the green plug with the green port, and the purple plug with the purple port, if you do not have USB plugs.

Don’t plug any power in until you have everything else hooked up. Connect your mouse and keyboard to the tower first. Be sure to match the green plug with the green port, and the purple plug with the purple port, if you do not have USB plugs.

Slide 13

Next, hook the monitor to the system unit using the VGA port.

On laptops, you will see mini-VGA ports. Use these if you want to plug your laptop into a larger screen.

Next, hook the monitor to the system unit using the VGA port.

On laptops, you will see mini-VGA ports. Use these if you want to plug your laptop into a larger screen.

Slide 14

Connect the monitor to the computer with the video cable. Then cables have prongs in the center and two screws on either side. Be sure to tighten the hand-screws on the monitor cable’s connector to secure it firmly to the monitor port.

Connect the monitor to the computer with the video cable. Be sure to tighten the hand-screws on the monitor cable’s connector to secure it firmly to the monitor port.
Sometimes you will see other kinds of ports and plugs used.

- A USB-A plug may be seen on cables that connect a keyboard or mouse to the computer.
- A USB-B plug may be seen on some printers.

Power connectors connect the power cord to the computer's power supply, and are also used to connect many monitors, printers and other peripherals to the electrical wall outlet. Connect power cords to each piece of equipment.

A surge protector allows you to power more devices than a wall outlet. It also protects your devices from power surges. This type of protection will make the devices last longer and prevent them from being damaged during electrical storms.
Slide 18
Connect power cords to each piece of equipment and plug them into the surge protector before turning it on.

Turn on the surge protector by clicking the red flip switch.

Slide 19
Turn on the monitor.
The power button is on the bottom right of the screen.

Slide 20
Turn on the computer last.
On a desktop, the power button will be a round button on the face of your computer.
Slide 21

At this point, the computer will begin to “boot up,” the term we use for the computer turning on.

Slide 22

You’ll see various things being displayed on the monitor.

All new computers will go through a special setup sequence the first time that the computer is turned on, so you’ll want to watch the monitor carefully for instructions.

Slide 23

You might need to allocate a bit of time for this process and you may need to answer a few questions about the setup as the machine goes through the process.
If you already have a printer, connect it after you have the computer up and running.
Most printers use one of the computer’s USB ports.

Be sure to also plug the printer into a power source, either an electrical wall outlet or a surge suppressor. Connect any other devices, such as speakers or a microphone.

If all goes well…
Congratulations!
The computer is running!

To take advantage of the many assets that computers offer, you will need to connect your computer to the Internet.

Let’s take a moment to understand what the Internet is.
• The Internet consists of “interconnected networks” of computers linked together to form a larger network known as the Internet.
• The Internet network contains all the information that has been posted to the Internet from all computers. It’s as if everyone in the world was sharing files in a single file cabinet.
The Internet is accessed through large computers known as servers. These large servers provide the backbone of the Internet.

The servers are directly connected to the Internet, through wires, cables, or satellite.

These servers act as intermediaries between the smaller networks and the Internet.

• To connect to the Internet, you need to connect to a server.
• Servers act like dispatch operators. When you request access to a website by clicking a link, the server “puts through the call” by making a connection.
• In this way, they “serve” customers by processing the requests for data and information transfers that we make each time we click on a link.

An Internet Service Provider (ISP) will also supply and install most of the hardware necessary to connect you to the Internet.

• For most computers, the only hardware required will be a **modem** and connecting cables.
Modems look a bit different depending on what kind of Internet service you choose.

The two modems on the left are common designs for a DSL connection. The modem on the right is the type used for satellite connections. We’ll talk more about these different types of connection in a minute.

What’s important to understand is that all modems perform the same function. A modem modulates, or changes, the information (web pages, videos, music) coming into and going out of your computer into signals that can be easily transported.

Modems change the signal carried between computers into one that can travel through airwaves easily. While the signal is carried, it is in this form. But before it enters the receiving computer, it is transformed back into a signal that the computer can read. The modem works on both ends of the message – changing the signal when it goes out, and changing it again, when it comes back in.
Modems change the signal carried between computers into one that can travel through airwaves easily. Browsers, such as Internet Explorer or Firefox, are the communication base from which your computer connects to the Internet. They work with your computer’s OS to allow it to access information coming from the Internet.

Technically, what the browser does is retrieves or fetches code, usually written in HTML (HyperText Markup Language) and/or another language, from a web server, interprets this code, and displays it as a web page for you to view.

*From “Web Browsers” on About.com*

Before you select an ISP, you need to determine the speed of signal you would like.

The two general categories of speed are broadband and dial-up.

Dial-up refers to a slow speed signal that can be accessed through traditional phone lines.

When you have a dial-up connection, your phone line is “busy” while you are using the line for an Internet connection.
Dial-up systems are not fast enough to allow access to most of the information available on the Internet. Instead, these dial-up connections are being replaced around the world by higher speed connections.

You can see from the chart, the difference in download times between using dialup and using BB. As websites become increasingly complicated and robust, full of sound, video, and interactive content, it is simply no longer adequate for accessing, using, and downloading information from the Internet. As a result, these dial-up connections are being replaced around the world by higher speed BB connections.

The pie chart graph shows the percentage of BB planned in different nations around the world. Chile hopes to provide access to over 90% of its citizens over the coming decade.

- Britain aims at universal service by 2012.
- Singapore hopes to have Broadband in every home and business by 2015.

In New Mexico, the state Broadband Program, the National Telecommunications and Information Agency, and other organizations and businesses, are working to make broadband connectivity available to all residents of the state.
According to the FCC, “Broadband can provide access to a wide range of resources, services, and products that can enhance your life in a variety of ways.” These include increased access to educational opportunities and resources, improved health service and medical care, greater access to government agencies and services, improved economic development and better communications.

To connect to broadband, your Internet signal will most likely be carried using one of several different kinds of systems:

- DSL
- Cable
- Wireless

DSL – This “digital subscriber line” transmits signals over a specially augmented phone line, using different frequencies than those of the phone conversation. Because the frequencies are different, you can use the phone and the Internet at the same time without interference.
Slide 39

**Cable**

This option uses television cable to transmit Internet signals by utilizing the unused bandwidth.

Slide 40

**Wireless**

This option uses e-m waves in the radio frequency to transmit Internet signals. It requires a source, such as a cell tower, and a modem receiver.

Slide 41

Unless you choose to install a satellite dish, you likely will not need any additional equipment except a browser system on your computer. Your ISP will supply the modem. Satellite service requires a dish, a modem, wires, and installation fees.
Which transmission system you use will mostly depend on what is available in your area and several other considerations:

- Cable service tends to be more expensive than DSL.
- Wireless broadband access requires proximity to a cell tower or Broadband signal source.
- DSL service generally requires that you are also signed up for a telephone landline.

Once you know the services available, it's time to select an Internet Service Provider.

How would you get started finding Internet service in your home?
Who are the Internet Service Providers in your area?
What considerations are central to you in selecting Internet service?
What are the main questions you have about this process?

When you are ready to choose an ISP:
- Ask people you know about their ISP.
- Look for DSL and cable broadband providers in your area.
- Make some phone calls and ask potential broadband providers about package deals.
- Cable companies generally discount Internet access if you have or purchase TV service.
- Phone companies sometimes offer DSL-telephone packages.

Instructor:
It is a good idea to look at one example of an ISP in the area in which you are
training. There may be small local companies with easy to read websites that will help you illustrate these points and also give students real information about getting BB in their community.

If you still have not found an available service that you can afford, try one of the following:
Consider other broadband options. Consider getting and sharing satellite broadband if you live in a rural area. Consider sharing an Internet connection with neighbors through a common wireless router. Consider accessing wireless Internet through your cell phone.
Slide 47

Review

• Setting up a computer
• Reviewing your Internet options
• Connecting to the Internet
• Finding and choosing an ISP

Slide 48

We appreciate the time you spent with us.
We hope to see you at the next training!

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Instructional Training Video
Sequence for setting up a desktop computer:

- Identify a location out of sun, near an outlet, with 12” of ventilation
- Connect the mouse and keyboard to the tower or system unit
- Connect the monitor to system unit with VGA cable and port
- Connect all power cords to each piece of equipment
- Turn the surge protector OFF; connect all power cords to the surge protector
- Turn the surge protector ON
- Turn ON the monitor using the button on the lower right of the monitor
- Turn ON the system unit using the POWER button
- Once the computer is running, connect peripherals such as printers. First, connect it to the computer; next, connect it to the power source; last, turn it on with the on/off switch (usually on the side of the printer).

An Internet Service Provider (ISP) allows you to connect your computer to the servers that will give you access to the Internet.

Modems are the devices that translate the signal coming into and leaving your computer. This allows the signal to be transmitted in the form of an electromagnetic wave, efficient for transmission, and be utilized as a digital signal, efficient for coded information, in the computer.

Broadband generally refers to a fast Internet signal. The term is used in contrast to dial-up, which delivers a very slow signal.

DSL stands for digital subscriber line. It refers to a specially augmented section of the phone line, different from the section used to transmit voice phone conversations, which can be used to transmit a high-speed, broadband signal using existing phone lines. Although this signal comes in over the phone wires, it is not the same as dial-up. DSL allows both phone and high speed Internet to run on separate sections of the same wiring infrastructure.

Cable Internet service allows a broadband signal to travel over the same cable that brings cable television service to homes. This broadband delivery option makes use of the unused bandwidth of the television signal to transmit Internet signals.

Wireless uses radio-frequency, high-speed electromagnetic waves to transmit an Internet signal. It requires proximity to a transmitting tower or satellite. Wireless that is set up in a home or business is created by using a router to change the signal entering the house via DSL or cable into a local wireless signal.

For information about broadband availability in New Mexico, visit the New Mexico Broadband Program website: http://www.doit.state.nm.us/broadband/
Assessment

SELECTING AND MAINTAINING A COMPUTER
MODULE 2 – ASSESSMENT

1. Put the following items in the order in which they should be performed when setting up a computer for the first time:

   a. Plug in the system unit and monitor
   b. Connect the mouse, keyboard, and monitor to the system
   c. Locate outlets and windows in the space in which you are setting up
   d. Turn on the system unit

2. With which of the following tasks will an Internet Service Provider assist you:

   a. Help you set up your computer
   b. Help you choose your browser
   c. Help you connect to an Internet server
   d. Supply you with a modem

3. When you receive your Internet signal through DSL, your signal comes in through your phone line and you will not be able to use your phone and the Internet at the same time.

   True  False

4. If you have cable television service, your cable service provider may also offer Internet service in a bundle with your existing television service.

   True  False

5. You can often get Internet connectivity with a satellite. Satellites have the advantage of being portable, but are initially expensive and difficult to maintain.

   True  False

6. A dial-up connection is less costly than a broadband connection, and therefore is a better choice for an initial Internet connection.

   True  False
SELECTING AND MAINTAINING  MODULE 3: Security software, updates, clearing files, and backing up

Summary, challenges, and instructional strategies

This module covers the fundamentals of maintaining a computer, focusing on the skills of updating operating systems; installing, using and updating security software; the varieties of malware and protecting against them; and the necessity of cleaning out old files and backing up your hard drive regularly. The class is often one of the most welcomed by students, as it teaches bits and pieces of information that are necessary for owning and maintaining a computer but are not generally brought together as one topic or class. It is also a class that produces many questions, as students bring up additional concerns or points of confusion.

The challenge of the class is to bring students to competency in so many skills so early in their experience with computers. While many may understand the material as covered in class, they may lag in adequate confidence for executing those steps on their own computers when they return home. Most training machines will not allow students to actually download and run security programs. Having a few machines that provide such practice opportunities would be a great asset for students still uncertain about downloading, installing, and running software on a computer.

Anticipate that many students may be genuinely surprised to learn that security software is not effective if loaded one time and left to run without updates for a year. Explaining the reasons behind keeping all software (operating system software as well as security programs) regularly updated and files cleaned will help provide incentive for following these recommendations.
New Mexico Broadband Program
Selecting and Maintaining a Computer
Module
Using and updating security software
Updating the operating system
Cleaning your files
Backing up your computer

Learning Outcomes
• Know how to install and use anti-virus software
• Know how to update operating and security software
• Know how to maintain clean file systems

By the end of the class, you should
Know how to install and use anti-virus software
Know how to update operating and security software
Know how to maintain clean file systems
Maintaining your computer

Like anything else, your computer needs upkeep and care in order to be able to keep operating at peak capacity. This includes upkeep and maintenance, which keep it running smoothly and performing well. This is like maintaining our own health and performance with regular exercise and good diet.

Your computer can also be compromised by external threats to which it is exposed when it is connected to the Internet. We can think of this in ways similar to the way in which we think of human health. When we are in any environment, we are exposed to the threats of illness and disease. These can make us sick even if we do take care of ourselves. The same is true for computers. When they are in environments in which they are exposed to other computers (the Internet), they come into contact with foreign bodies that can make them ill.
We refer to the most common of these threats as viruses. Computer viruses are not actually viruses. They are computer programs that can be carried into our computer along with small bits of transmitted information. But they do often act in ways similar to real viruses. Once in our computer system, they replicate and destroy healthy material on our computer – our files, our operating system, our RAM. And like human viruses, computer viruses can easily be transmitted from an infected computer to another healthy computer which has contact with the infected machine. You can transmit a virus from computer to computer by sending an email attachment, sharing files on a network, or saving files between computers on an external storage device such as a flash drive or a camera chip.

In order to keep your computer safe from viruses and other hazards, your will need to install anti-virus software.
Anti-virus programs do two things. First, they detect threats coming in to your computer, isolate them, and prevent them from damaging your computer files or programs. Secondly, they can scan the material in your computer when you ask them to and make sure no files are infected.

Microsoft offers a free antivirus program called Security Essentials. Instructor: Take students to the review or project and read a bit about it with the class. You can also show students where to access and download this program.

You may want to recommend other free anti-virus software such as AVG.

If you have a newer computer which has Windows 7 installed, you may already have this software loaded on your machine. The icon for this security software may be posted on your taskbar or desktop and will give you access to the Security Essentials program on your computer. To access this program on your computer, open the castle icon on the right side of your taskbar. This icon may be green or red, and will have a flag on the top.
Not all software programs will have the same appearance, but most are very similar. Each has a home tab, which generally offers the opportunity of checking the system status – that is, are the security checks turned on and are they up to date. There will usually also be several other tabs that allow you to update, view the security history (letting you see if and when a virus may have been found), and adjust any settings.

Instructor: You will want to review these tabs with your class using the security system installed on the training laptops. You will need to explain each tab and walk students through some of the key functions together with them, using the security system on the class computers.

Key points to explain are:

- Protection is on. This means there is a safety net around your computer provided by the software that will catch any viruses that try to enter the computer.

- Scans. Discuss the difference between real time security and scans; also between full and short scans. Students should do a short scan once a week and a full scan once a month.

- History – even if nothing has been captured, show students the settings and explain quarantining.

- Settings – while students may choose to set for automatic scans, explain that computer much be on for these to occur.
One of the most important elements to notice about your security program is whether or not it is up to date.

After you have checked to see that your software is running and have scanned your computer, you will want to check the update tab to make sure your security software is up to date. Viruses are like everything else about computers — they are always changing. In order to be able to catch the newest viruses, your anti-virus software must stay up to date. If it is not updated, it will not be able to protect your computer against any viruses that have been created since the last update. Since viruses are created literally every day, you should update your anti-virus software at least once a week!

Instructor: Show students how to see if their software is up to date. If it is not, and there is only one update, you might have them update in class. Make sure you check beforehand, however, as some service packs come as single updates but are very, very long!

In some cases, you may find yourself working on a computer that does not have an icon for a security system on the desktop of the Taskbar. In this case, you can find the security system on your computer by looking in the Control Panel.

To do this, use the Start button on your desktop. Click once on the Start button, then double click on Control Panel.
The control panel lists various areas of your computer which require settings, adjustments, changes, and additions. These range from the desktop (changing the background) to programs (installing and uninstalling new software). The anti-virus program information can be found under the “System and Security” setting.

The system and security tab will also show you information about your firewall and may also have information about other updates.

Spyware is different from viruses in that it is constructed not to disable your computer and its functions but rather to take information from your computer. Spyware makes it possible for information on your computer, such as passwords, security codes, and other personal information, to be removed, potentially giving people access to your records or financial accounts.
In addition to anti-virus and anti-spyware software, you will need to protect against other threats called malware.

One of the best anti-malware programs available is Malwarebytes.

Malware is similar to viruses in that it is a program created to disable your computer in some way. Malware is the general term; technically, viruses and spyware are both types of malware. Malware also includes other computer contaminants such as worms and Trojan horses.

Malwarebytes is an additional program that will catch those other contaminants that are not viruses or spyware.

It is a good idea to have two or three separate anti-virus/spyware/malware software, since each program is stronger in particular areas, and some overlap helps ensure protection.

Many users who are still new to computers are uncertain about when it is safe and when it is not safe to download a program and install it on your computer.

When in doubt, always ask a professional.

If you can’t, use the Internet to help you learn about a particular company or program.

Watch for consistency in logo and site names.

Make sure that you are downloading a free copy; don’t let the website change this for you!

When you have the right website for the download, make sure you download AND install!
 Updating the systems on your computer is also an essential part of keeping the system running efficiently and making sure you receive all the newest protection.

Updating should always include updates to your operating system, Windows.

But even if you have anti-virus, anti-spyware, and anti-malware software all installed on your computer, and even if all of these programs are running and up to date, you are STILL not done with your maintenance work! There is one more set of updates that you must perform regularly on your computer. These are updates to your operating system. In the case of a PC (not an Apple computer), the operating system will be Windows.

Just as viruses and security software changes constantly, so does the operating system software. For the OS, the changes occur in order to improve performance, create greater functionality, and correct problems. There are also improvements made regularly to operating systems. Furthermore, software programs are continually changing. For the new software to work well with your OS, you must keep your OS up to date. Even if you don’t change software, you will encounter updated versions every time you access a website on the Internet.

Windows comes out with significant OS updates ONCE A WEEK. In order for your computer to keep running well and provide good access to new websites, you must update your OS software. If you do not update the OS, you will gradually lose ability to access websites and use your software programs well.
To update Windows, you must first open Internet Explorer. Select this program from your taskbar or from the Start menu.

When IE opens, find the “Safety” or “Tools” tab on the right hand side of the top toolbar.

Which tab has the Windows Update option depends on the model of your computer and the software year.
The updates screen will show you whether you need to update Windows. If Windows is not up to date on your computer, you will see a message stating how many updates are needed. You will have to select these and click on the update button to have these downloaded.

Installing anti-virus software and keeping this and your operating system updated is still not enough to keep your computer running well. These are necessary, but you will also need to make sure that your computer is clean. What makes computers dirty?

Computer systems get “dirty” from the many remnants of the work they do, the tools they use, the files they create, and the sites they open.
Keeping your computer clean will also help make it run efficiently and smoothly.

Computers are like any other system. They need to be clean in order to run smoothly and efficiently. Too much grit or old oil in a car system will interfere with good functioning of a car engine. Too much cat hair will plug up the drains. Too much unnecessary stored information will bog down a computer and keep it from operating rapidly and efficiently.

To begin the cleaning process, open Internet Explorer, click on the “Tools” tab in the top toolbar, and scroll down to “Internet Options.”

To clean your computer, you will need to find the place where extra information is kept. Most of the space consuming information comes from the websites we visit rather than from the files and images we store on our computer. To begin the cleaning process, open Internet Explorer, click on the “Tools” tab in the top toolbar, and scroll down to “Internet Options.”

Under the “General” tab, the second option allows you to “Delete” Browsing History.

Click on the “delete” button.
The “Delete Browsing History” menu offers several choices of items to delete.

Preserve favorites – By checking this, you will NOT delete your list of favorite websites stored on your computer. When you are done checking the boxes, make sure you click the “Delete” button at the bottom of the page. Depending on how “full” your computer is, it may take a minute for the extra files to be deleted.

In order to safeguard the valuable information on your computer, you should perform regular backups of that information. “Backing up” means creating a duplicate copy of the files on your computer. You can do this by copying documents onto a CD. More and more, people are choosing to back up on “the cloud.” This means that you will save your documents to an online site. It might be Google docs, it might be on a wiki, or it might be on a special cloud based backup site, such as Dropbox.
Whichever you choose, make sure you understand the storage system well. If you have documents that are especially important, creating more than one form of backup is not unreasonable. For removable storage device backup, make sure that you store your backup in a safe place away from your computer.

When you back up your computer, you will want to select only the information that should be copied. What do you select for backup? Backup documents and files that you have generated. Those files can represent your work, your photos, your music, or your budget. Don’t back up programs or Internet files that you can access easily online.

One of the most important aspect of backing up information is being organized about the way you manage the process. If you are using a cloud back up system, it may automatically update any changes you make to your files that are part of your back up. For other cloud systems and for traditional back up, you will have to back up regularly, especially after you have made significant changes to your work. Remember - if you have backed up on a Friday and you have a crash on the following Monday, the backup file will
only restore your files as they were on the previous Friday.

For traditional backup, the more files that you’ve selected for backing up, the longer the backup process will take.

Review
• Using and updating Security software
• Updating the operating system
• Cleaning out extra files and websites
• Backing up your computer

Review what we learned
Using and updating Security software
Updating the operating system
Cleaning out excess files
We appreciate the time you spent with us.
We hope to see you at the next training!

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Demonstration Training Video
Computer viruses are miniature program elements that can enter your computer from websites, email, and flash drives. They can interrupt, corrupt, and destroy the working systems on your computer. Once a computer is infected, the viruses can spread to other computers that exchange email messages or share flash drives with the infected computer.

Anti-virus software is designed to filter out viruses. It runs in the background as your computer is working and acts like a sieve that prevents viruses from accessing a computer. Anti-virus software also identifies and quarantines any viruses that may become established on a computer. Anti-virus programs must be updated regularly (at least once a week) in order to remain effective against the constantly changing viruses that are created.

Scanning refers to using an anti-virus program to scan existing files on a computer. This is different than the automatic screening anti-virus programs do, which only addresses new or incoming threats to which a computer might be exposed. Scanning is used to detect any viruses existing on computer files that may not have been successfully filtered.

To access anti-virus software installed on a computer, in order to update or scan, go to Control Panel and click on System and Security.

Malware is the general term used to refer to all computer-based threats, including viruses, worms, and Trojans. Spyware is one of the more commonly encountered forms of malware.

http://download.cnet.com/Malwarebytes-Anti-Malware/3000-8022_4-10804572.html  (Review and download)  
http://download.cnet.com/Microsoft-Security-Essentials/3000-2239_4-10969260.html  (Review)  

To update Windows, click on “Safety” at the right of the top Windows menu, scroll down to “Windows Update,” click, and follow the links for downloading and installing updates.

To clean history, click on “Tools” at the right of the top Windows menu, scroll down to “Internet Options,” and click. Under the “General” tab of the dialog box, click the “Delete” button under “Browsing History.” Check all boxes on the next screen, then click Delete.

To back up your files, save important folders to a flash drive every week.
Assessment

SELECTING AND MAINTAINING A COMPUTER
MODULE 3 – ASSESSMENT

1. If your computer is connected to the Internet, it may catch a virus, spyware, or malware.
   True    False

2. Once your computer has a virus or other form of malware, it can transmit that illness to other computers through email or shared files from a portable storage device.
   True    False

3. Once you install an anti-virus program on your computer, you do not need to worry about it again for another year.
   True    False

4. Your anti-virus program will be checking for new, incoming viruses automatically in the background while you browse the Internet or work on files.
   True    False

5. You should only update your computer operating system software when a new version of windows comes out.
   True    False

6. Full maintenance of your computer should include which of the following:
   a. Updating operating system software
   b. Updating security system software
   c. Scanning files weekly
   d. Deleting old files and stored websites

7. Backing up your computer will not help prevent your computer from crashing, losing files, or catching a virus.
   True    False
RESOURCES FOR SELECTING AND MAINTAINING A COMPUTER

Websites and Online Training

http://www.gcflearnfree.org/internetsafety/2
This class, offered by gcflearnfree, is an excellent review of the key practices needed in order to protect a computer from threats such as viruses, malware, spyware, and other program based hazards. The course gives an excellent review of the steps needed to select a good antivirus program, including a list of good review and information sites, and a review of other factors to consider in choosing anti-malware tools. The class also reviews instructions for updating programs and backing up your files, including using cloud applications for back up. This up to date module is an excellent resource and a great review for the material covered in the training modules.

http://compreviews.about.com/od/buyers/bb/NotebookPCs.htm
http://compreviews.about.com/od/buyers/bb/DesktopPCs.htm
http://compreviews.about.com/od/notebooks/u/pcreviews.htm
These three links provide basic information about considerations when buying a computer. The first site focuses on laptop style computers and reviews general considerations of standards as well as specific models. A similar approach is taken to desktops in the second site listed. The last of the three links provides reviews for a selection of PC styles and types. While the best overall categories of reviews tend to be helpful (e.g. “Best Thin and Ultralight Laptops”), the reviews of specific makes and models appears to be an idiosyncratic collection, many of which are a year or more outdated.

http://reviews.cnet.com/desktop-computers/?tag=reviewCategories;revCatWrap
http://reviews.cnet.com/laptops/?tag=reviewCategories;revCatWrap
These two review pages from the cnet review site list reviews for desktop and laptop computers separately (there is yet a third page for tablet reviews). Like all cnet reviews, these pages do a great job of providing general considerations, making good recommendations, and offering additional helpful information. Cnet reviews are the first and best recommendation for reliable and helpful computer reviews. Don’t overlook the Laptop Buying Guide and Desktop Buying Guide featured on each of the sites, for a complete review of user needs, computer components, and standard requirements.
Instructional Strategies for Selecting and Maintaining a Computer

Slide 1

New Mexico Broadband Program
Train the Trainer Toolkit
Selecting and Maintaining a Computer
Challenges and Instructional Strategies

Slide 2

Introduction to the Internet
Instructional Strategies and Challenges

Learning Objectives
Selecting and Maintaining a Computer
Understand key challenges
Acquire tools for successful delivery

Slide 3

Selecting and Maintaining a Computer
Address common student concerns about computer purchases

• Provide a general framework – standard machines with adequate requirements for normal work are now the norm for most equipment offered.
Keep exploration of computer and consumer websites directed and focused

- Become familiar with computer and consumer research websites before exploring with students
- Chart a clear path through each site to look at particular aspects of computer features that reinforce class topics
- Check in with students occasionally to make sure they are all on the same page – literally!!

Setting up and connecting to the Internet

- Explain that setup processes are becoming simpler and many computers are ready for use “out of the box.”
- Clarify that using the computer and using the Internet are not synonymous. Many beginners and novices will not fully comprehend this.
- Emphasize that in many areas, affordable Internet connectivity with reliable service is an issue. Engage the problems in your area and consider exploring resources for discounted rates.

Security programs and updates

- Many beginners do not realize that security programs are a necessity and that using more than one (for different kinds of malware) simultaneously is now standard practice.
- Review some recommended programs, pointing out steps for downloading. Address student anxiety about downloading programs and knowing which are from safe sites.
- Explain that there are two steps to installing programs – downloading first, then installing. If possible, do a demonstration in class.
Slide 7

Security programs and updates

Many beginners think that the installation of security programs is the only requirement for protection.

Explain
- Why security programs must be updated in order to offer protection
- How to update security programs
- That updating should be done automatically or weekly, at a minimum.
- That updating and scanning cannot be done unless the computer is connected to the Internet and turned on.

Slide 8

Operating system updates and scheduling

- Explain why operating system updates are an important part of maintaining computer security, and that different operating systems need different updates.
- Explain that some commonly used programs, such as Adobe or Flash, will also require frequent updates. These may appear as pop-up messages and should be updated and installed.
- Remind students that automatically scheduled updates will only work if computers are turned on and connected to the Internet at that time.

Slide 9

Cleaning files

- This is an opportunity to explain the way in which computers save copies of websites and separate downloaded versions of files, all of which take up space on a computer.
- Explain that extra space devoted to these unnecessary saved items slows down computer speed and limits functionality.
Slide 10

Backing up

- Make it clear that all computer systems or hardware fail at some point, so back-up is not an option but a requirement.
- Emphasize that back-up files only reflect the latest version backed-up, so frequent back-ups increase security and reduce risk. Back-up should be part of regularly scheduled maintenance.
- For professionals, cloud back-up systems are the better option. Be prepared to explain and show one cloud back-up system, such as Dropbox or sugarsynch, as the audience may be interested in this alternative.

Slide 11

Thank you for bringing digital literacy to your community!!

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