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
Computers are similar in many ways, but differ substantially in their size and their styles.
Computer capacities and styles

Mainframe

• A mainframe is a large, powerful, expensive computer that can support many users at the same time.

• Large businesses or organizations use mainframes.
Computer capacities and styles

Desktop Computers

• 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

Laptops are more portable versions of a computer.

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

Tablets are the newest and fastest developing style of computer.

Tablets have touchscreen access to all functions, including the keyboard.
Smartphones

Smartphones, such as iPhones, Blackberries, and Droids, are gaining increasing capacity to function as computers.

These phones can now pick up both phone signals and wireless Internet signals.

Images courtesy of reviews.cnet.com
Network computer

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 computer can be networked, as long as it has the capacity to share information.
Those are the different types of computers.

But what are the key parts?
Computer Parts and their Function

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.
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.
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 is also the computer’s main, long-term storage location.

The hard drive is one of the key features of the computer.
• Most hard drives can hold up to 2 Terabytes of data.
• This is about equal to 200 million written pages.
Memory

A computer’s short term memory is called RAM, for “Random Access Memory.” RAM is a temporary memory, rather like the available workspace or the room on your desk. The more RAM your computer has, the more work you can bring out at once.
RAM is an important factor in a computer’s performance. The more RAM a computer has, the greater it’s ability to “multi-task.”

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.
RAM

• 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.
Memory and the hard drive work together

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 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 approximately 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 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 in to 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.
Step 1: Computer Type

If your computer work will be in one location, a desktop computer may be your best choice.
Desktop systems offer the option of a larger monitor screen. Larger monitors cost more, but allow easy viewing of text, movies and games.
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.
A desktop system offers both 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.
A desktop system offers both advantages and disadvantages over a laptop system.

**Laptops**
- Lower capability
- More transportable
- Require little set up and storage space

**Desktops**
- Exceed laptops in capability
- Not transportable
- Require large and permanent set up space
Step 2: Determine your computer use needs

The next thing to consider in selecting a computer is the type of tasks for which you will be using it.
What tasks do you intend to perform with your computer?
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.
Step 3: Determine system requirements for your needs

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.
CPU

Remember: the Central Processing Unit (CPU) is the microprocessing 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.
What else is important in selecting a computer?

• Learn from others: ask family, friends, co-workers.
• Do some research.
• Check prices at several places.
• Match prices and functions.
• Cut price with style rather than capacity.
Follow along as your instructor researches the Dell laptops used in this classroom at:

www.dell.com
Check various review sites for information on reliability and customer service ratings as well as warranty terms for different manufacturers.

- [reviews.cnet.com](https://reviews.cnet.com)
- [Consumerreports.org](https://Consumerreports.org)
Software typically runs several years behind the hardware, so note the system requirements of any software you are considering purchasing.
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.
Most importantly, find a local tech support person who will work with you.
Review

• 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 New Mexico Department of Information Technology, Fast Forward New Mexico, and the New Mexico State Library, under grants provided by the National Telecommunications and Information Administration. These materials are not to be used for profit.

Connecting you to a world of opportunities