Computer Technology

Review
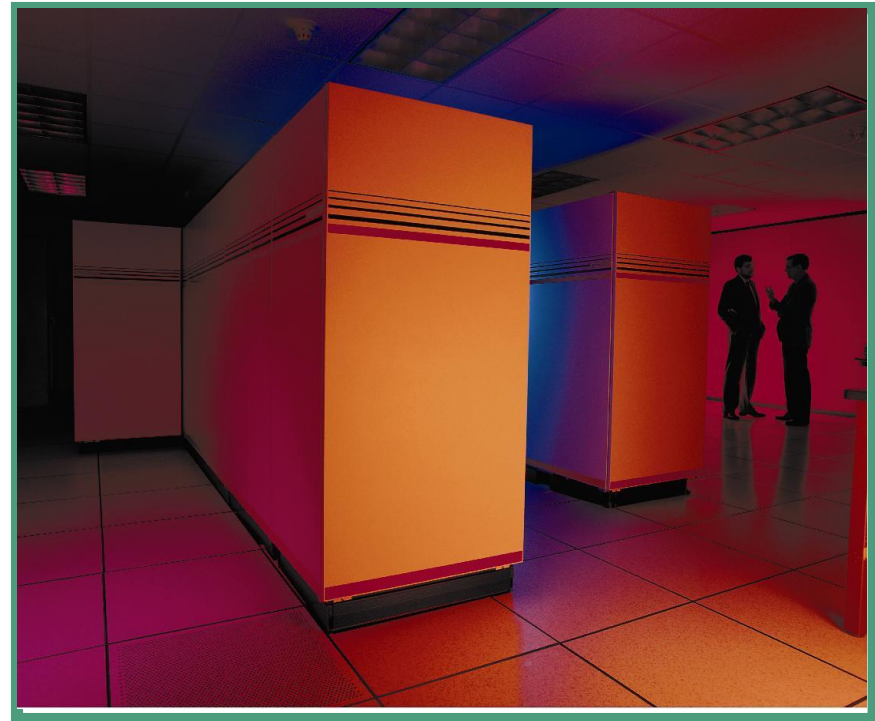
Multi-User Computers

Supercomputers…

the most powerful computers made

Multi-User Computers

Mainframes…

allow several users access to the same computer. About the size of a refrigerator and cost $1 million.

Minicomputers…

smaller and less expensive

than mainframes. They

have largely been replaced by **Servers and workstations.**

Single-User Computers

Workstations…

the power of a minicomputer but less expensive.

Single-User Computers

Personal Computers (PC)…

dedicated to serving one user

Portable Computers

Laptop

– computers with flat screens, that are battery-operated and lightweight

Palmtop

- computers that are pocket-sized; power is not lost over portability

Special-Purpose Computers

Special-Purpose…

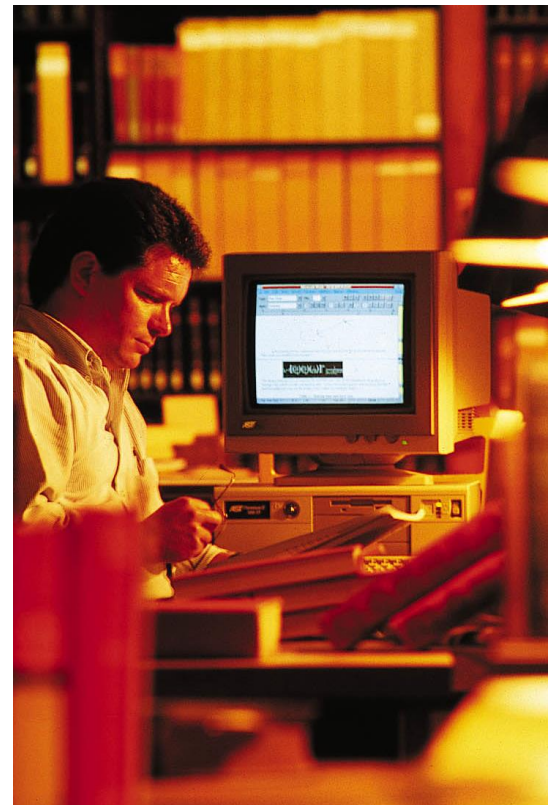> often attached to sensors to measure and/or control the physical environment

Embedded…

> used to enhance consumer goods

Basic Network Anatomy

- A computer network is any computer system that links two or more computers

- There are three essential components in a network:
    - Hardware
    - Software
    - People

Computer Connections

- Local Area Networks (LAN)
  - designed to share resources
  - allow communication between users (usually in the same building)
- Wide Area Networks (WAN)
 - designed to share resources
  - allow communication around the globe
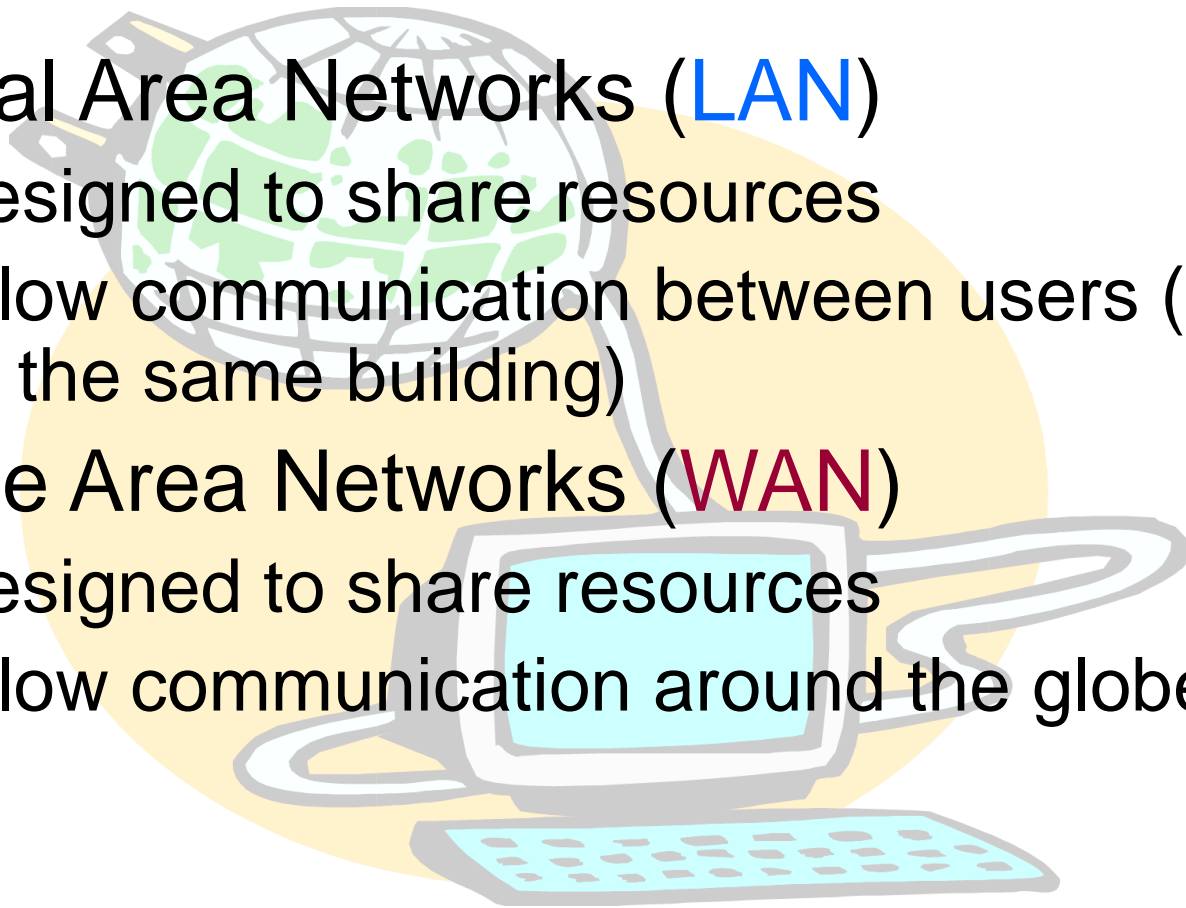
LAN (Local Area Network)

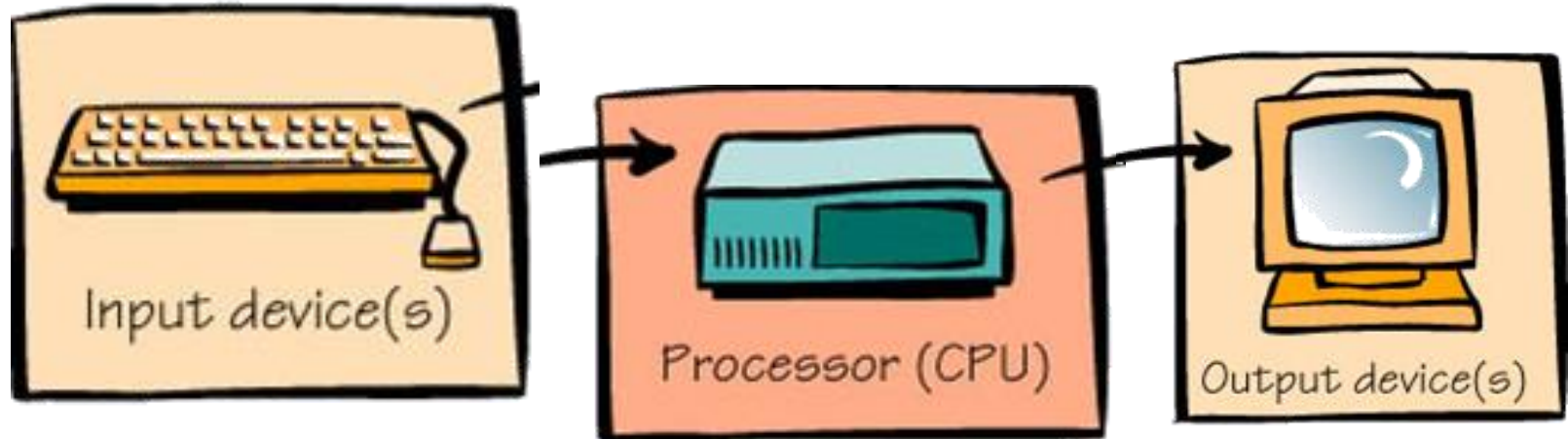A LAN is a network in which the computers are physically close to each other

- They typically share peripherals (printers and servers)

- Each computer and shared peripheral is
a *node* on the LAN

Networks Near and Far

There are two general types of computer networks:

LAN
(Local Area Network)

WAN
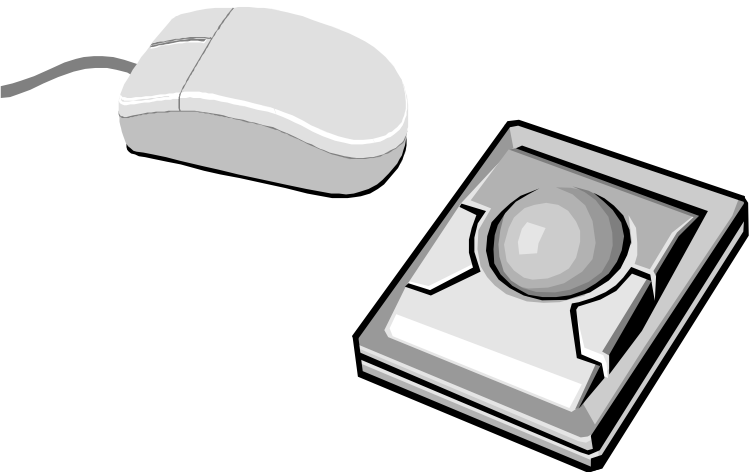(Wide Area Network)
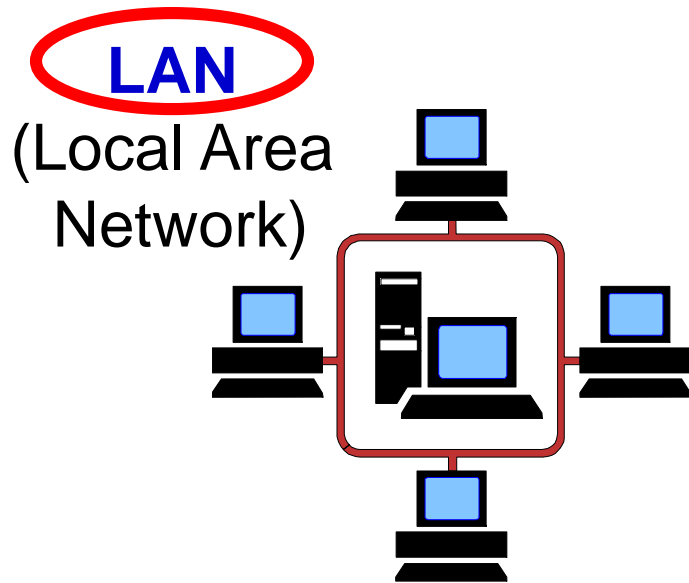
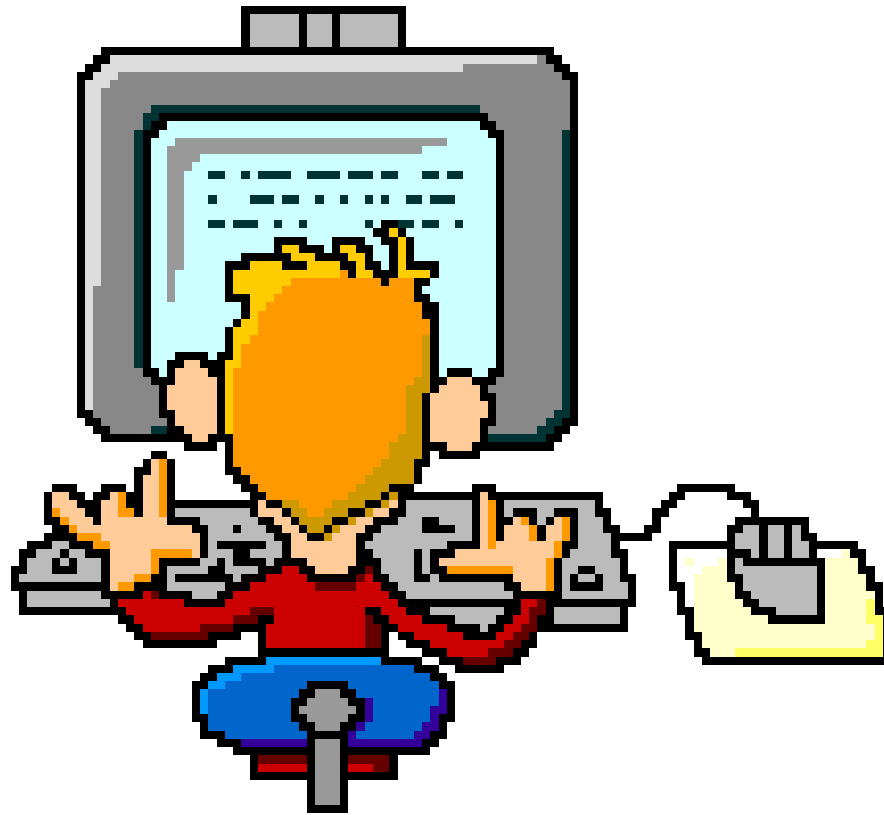# What Computers Do

Receive input

Process Information

Produce Output

Input Devices

- Computers accept information from the outside world

- The keyboard is the most common input device

- Pointing devices like the mouse also receive input

Input: From Person to Processor

The Omnipresent Keyboard

Keyboards are used to input and manipulate information with keys such as **Letters and Numbers...**

The Omnipresent Keyboard

...and **Cursor Keys** that allow you to move around the screen

...**Function Keys** that send special commands...

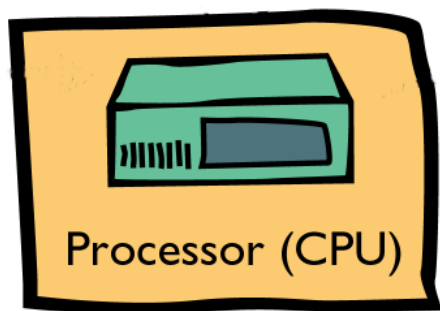# Pointing Devices

Trackball

Joystick

Touch pad

Track point

Touch Screen monitor

Process Information

- The processor, or central processing unit (CPU), processes information and performs all the necessary arithmetic calculations.

- The CPU is like the "brain" of the computer.

The Computer's Memory

RAM (random access memory):

- is the most common type of primary storage, or computer memory

- is used to store program instructions and data temporarily

- unique addresses and can be stored in any location

- can quickly retrieve information

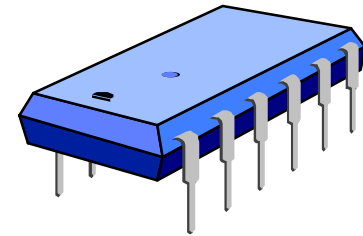- will not remain if power goes off (volatile)

The Computer's Memory

- **ROM** (read-only memory):

  - information is stored permanently on a chip.

  - contains startup instructions and other permanent data.
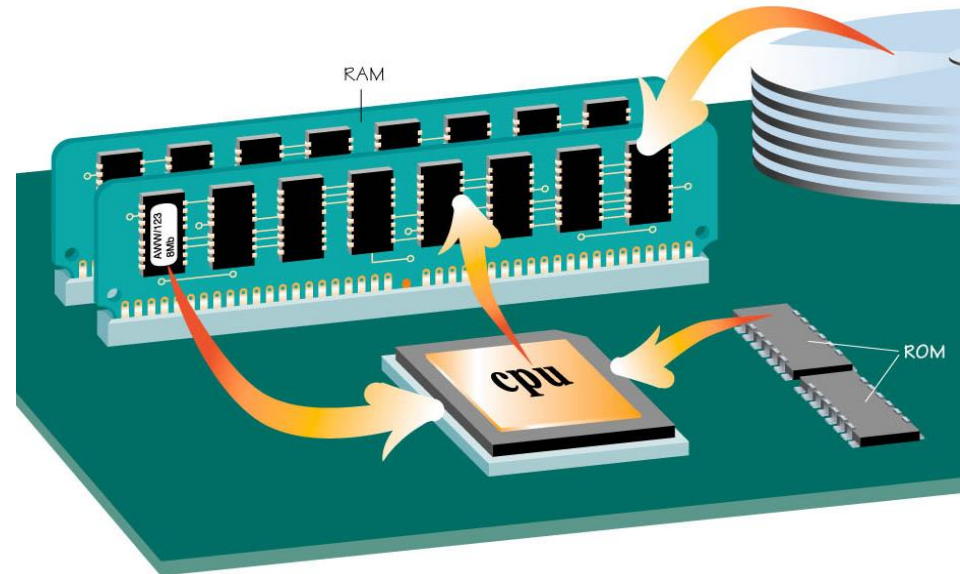
Store Information

- Memory and storage devices are used to store information

- Primary storage is the computer's main memory

- Secondary storage uses disks or other media

# Buses, Ports, and Peripherals

- Slots and ports also allow external devices called **peripherals** to be added to the system (keyboard, monitor, and mouse).

- Without peripherals, the CPU and memory are like a brain without a body.

Output Devices

- Computers produce information and send it to the outside world.

- A video monitor is a common output device.

- Printers also produce output.
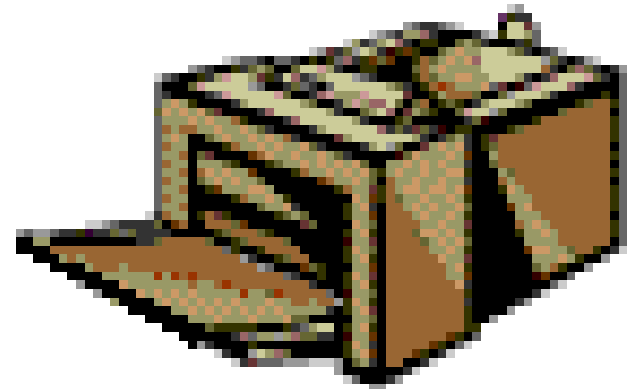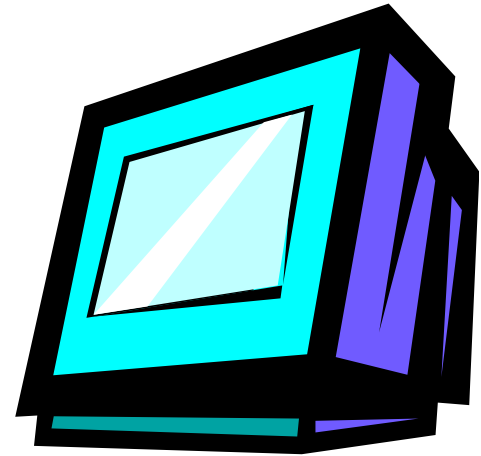
Information

Information comes in many forms

- Words . . . Numbers . . . Pictures . . . Sounds

- Computers only understand information in digital form
  - ❖ Information must be broken into bits

Bits, Bytes, and Buzzwords

- Common terms might describe file size or memory size:

  - **Bit**: smallest unit of information

  - **Byte**: a grouping of eight bits of information

  - **K**: (kilobyte); about 1,000 bytes of information - technically 1024 bytes equals 1K of storage.

Bits, Bytes, and Buzzwords

MB: (megabyte): about 1 million bytes of information

GB: (gigabyte): about 1 billion bytes of information

TB: (terabyte): about 1 million megabytes of information

Speed

- The computer's speed is measured by the speed of its internal clock - a device to synchronize the electric pulses.
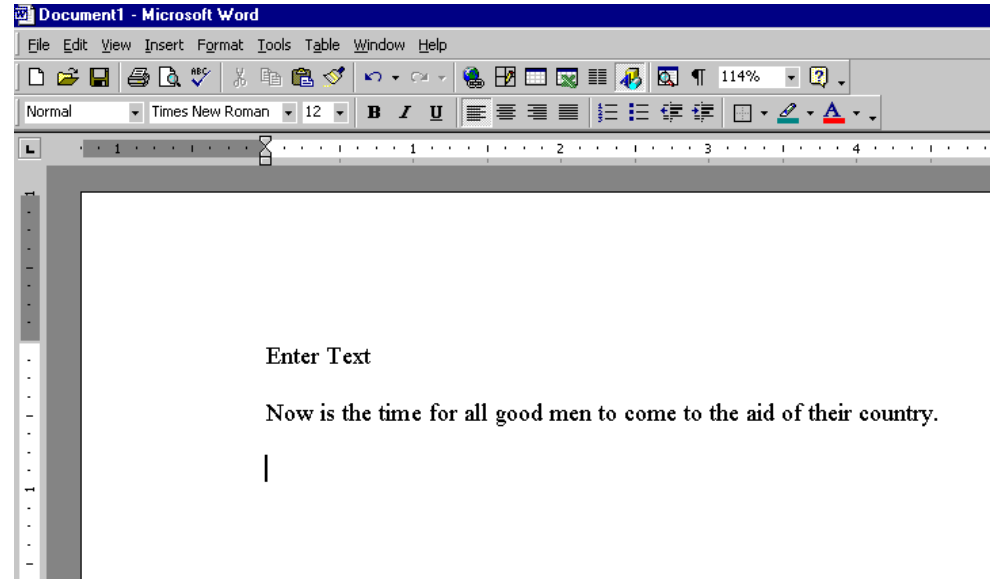
  - Speed is measured in units called Hertz (Hz). Instead of megahertz it is now up to gigahertz

Word Processing

Entering text

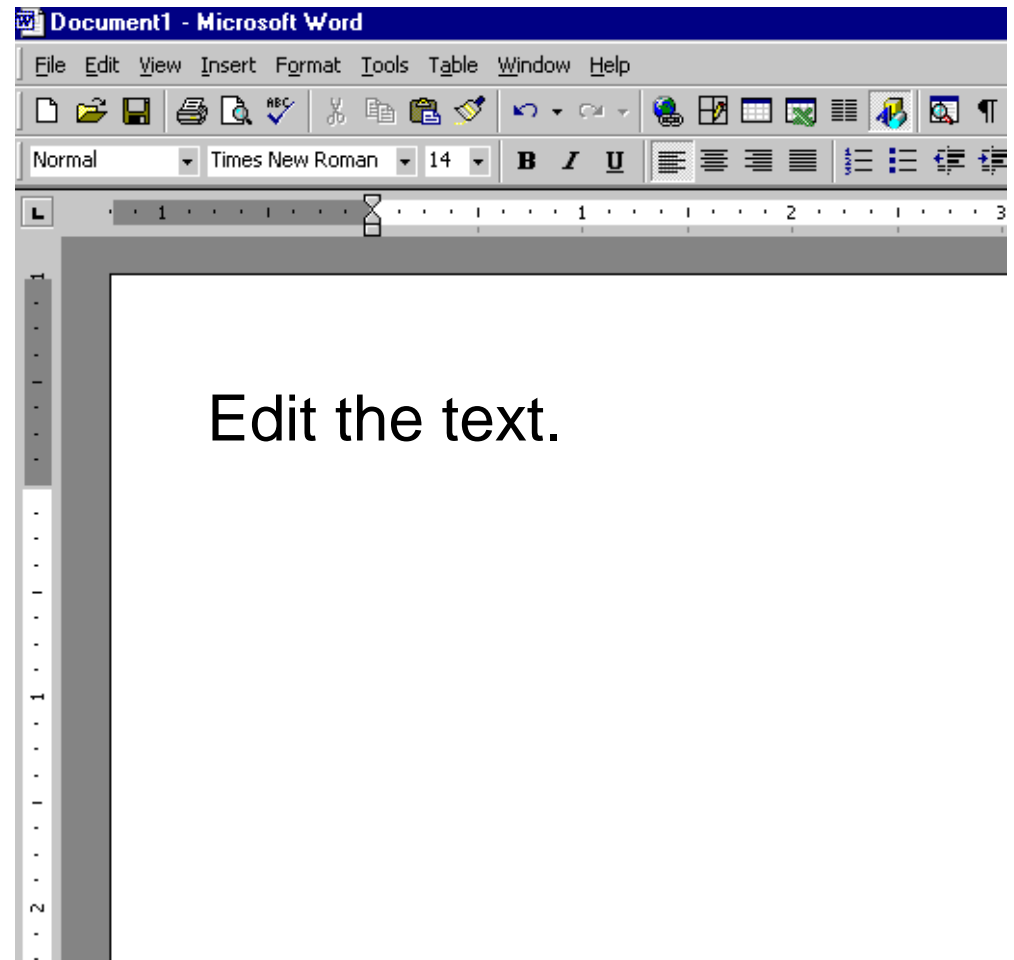As you type on the computer keyboard, your text is displayed on the screen and stored in the computer's RAM.

Word Processing

Editing text

- Editing is the process of rewriting and refining a document.

- Text can be deleted, inserted, moved, copied, and searched.

Document1 - Microsoft Word

File Edit View Insert Format Tools Table Window Help

Normal | Times New Roman | 14 | B I U

Edit the text.
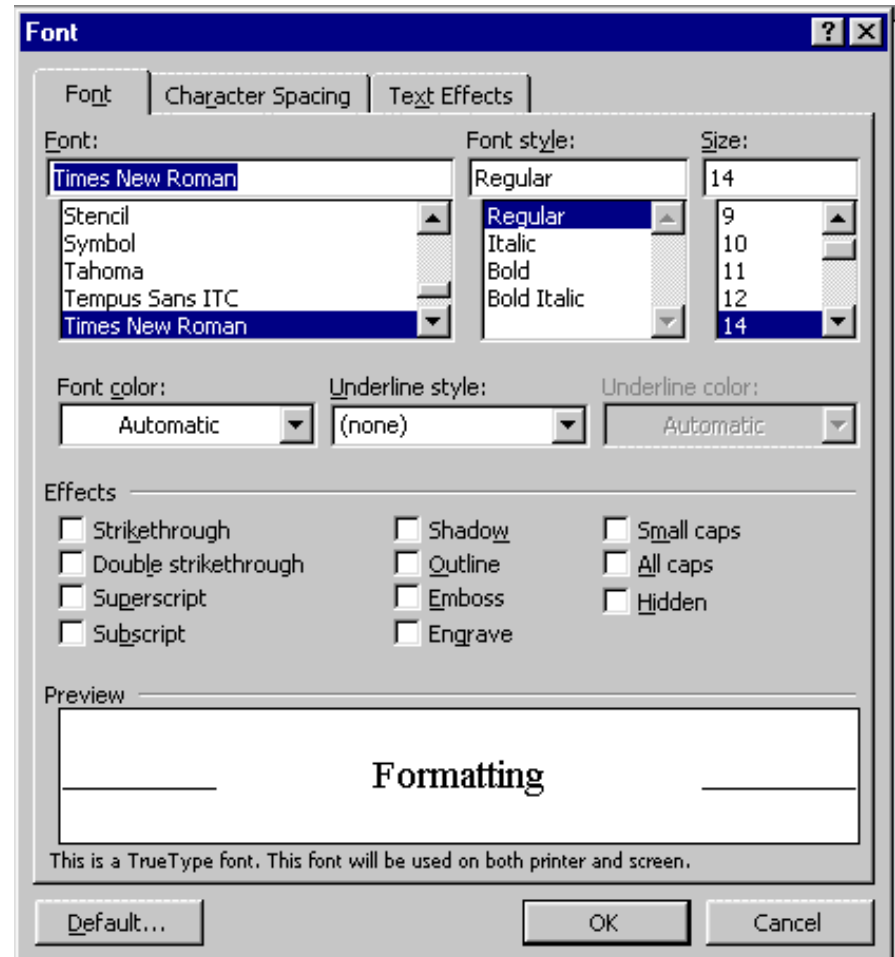
Word Processing

Formatting text and document layout

Text formatting commands allow you to control the format and style of individual characters and paragraphs as well as complete documents.

WYSIWYG
"what you see is what you get"

Formatting Characters

Character size is measured in points, with 72 points is equal to one inch.

200 pts

120 pts

80 pts

40 pts

20 pts

A A A A A
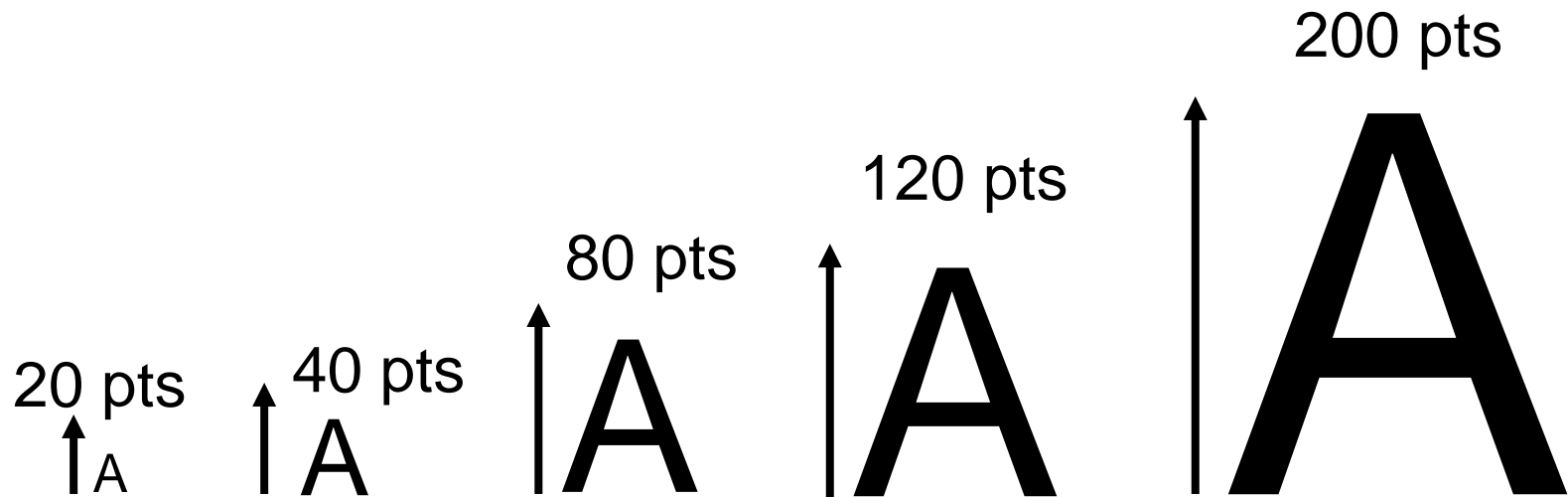
Formatting Characters

A font is a size and style of typeface such as:

Times
Courier

Regular Joe
Birch
Remedy

Zapf Chancery
Kuenstler Script

Helvetica
Avant Garde

Formatting Characters

Serif Fonts are embellished with fine lines at the ends of the main strokes like these fonts:

Times
Courier

Zapf Chancery

Sans-serif Fonts have plain, clean lines like these:

Helvetica
Avant Garde

Arial

Formatting Paragraphs

Justification allows you to adjust the left/right margins in four different formats.

This text illustrates left justification. For left-justified text the left margin is smooth and the right margin is ragged.

This text illustrates right justification. For right-justified text the right margin is smooth and the left margin is ragged.

This text illustrates centered justification. For centered text both margins are ragged. Centered text is often used for titles.

This text illustrates full justification. For fully justified text, spaces between words are adjusted to make both margins smooth.

Formatting the Document

Changing the document formats include:

- – Headers, footers, margins
- – Multicolumn tables
- – Inserting multimedia
- – Footnotes
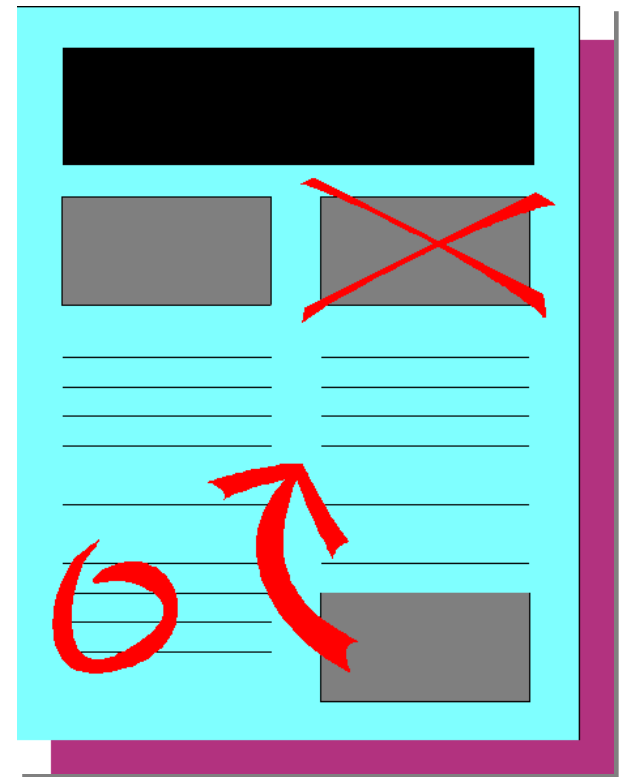
Thesaurus

The thesaurus is an invaluable tool for finding just the right word.
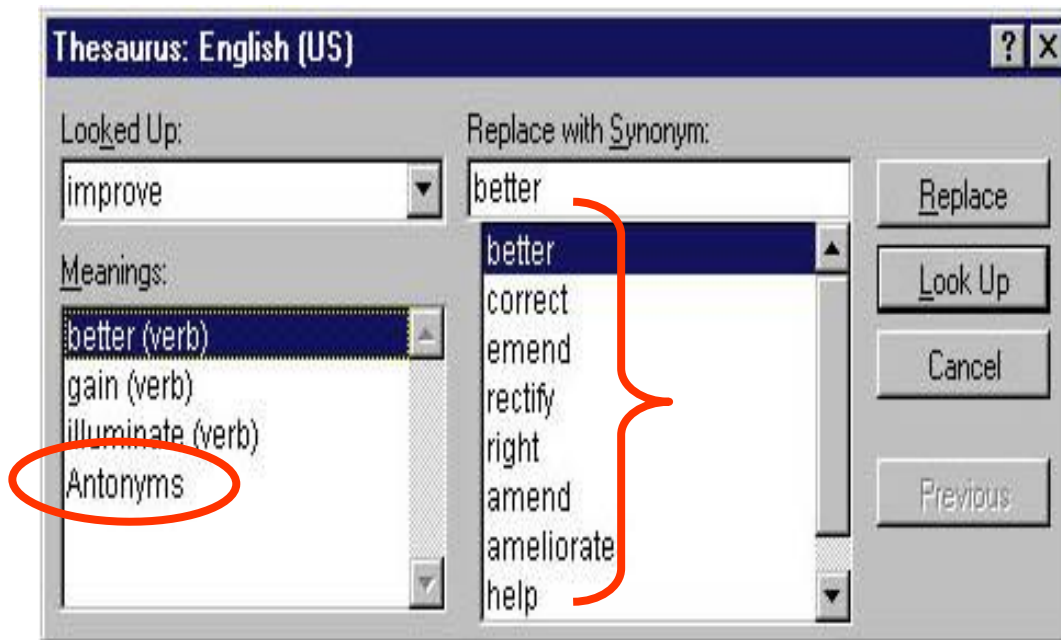
Synonyms and Antonyms can be found in the thesaurus.

Spelling Checkers

Spell Checkers flag words that do not match words in their dictionary or double words. It will not catch words spelled correctly but misused. (Here, hear; see, sea; their, there)

Ignore

Change

Add to Dictionary

It's up to you to decide what to do.

Grammar and Style Checkers

Grammar-and-style checking software analyzes each word in context, and offers suggestions for common grammatical errors and stylistic foibles.

Grammar: English (US) ? X

Sentence:
... Our life **is frittered** away by detail.

Ignore

Next Sentence

Suggestions:
This main clause may contain a verb in the passive voice.

Change

Ignore Rule

Cancel

Explain...   Options...   Undo Last
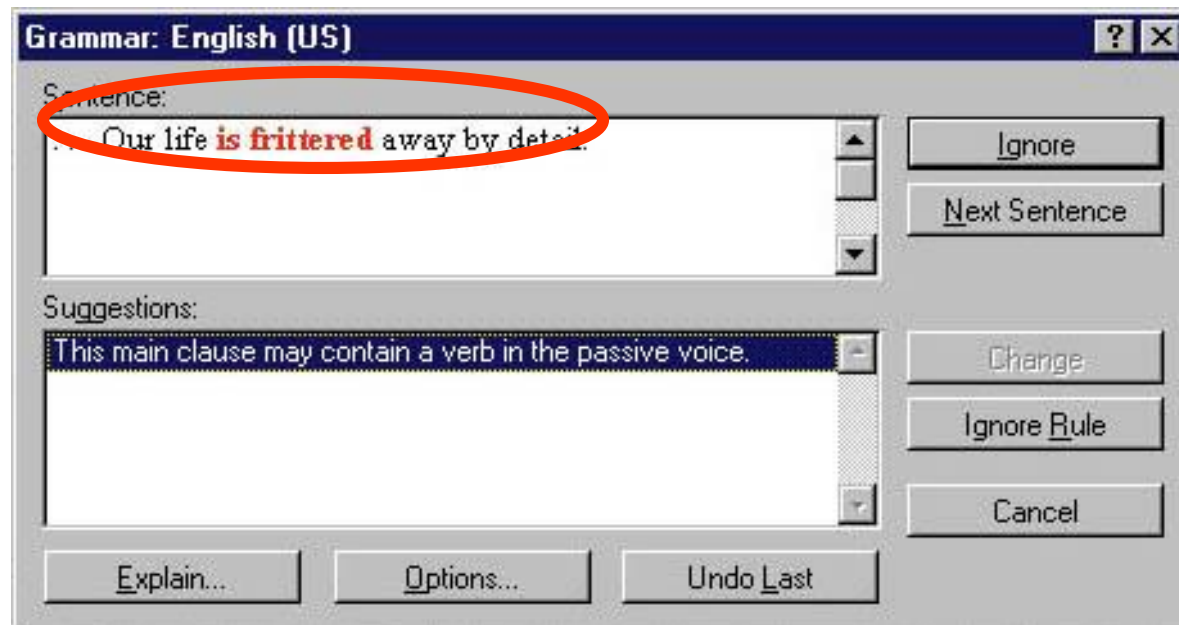
The Spreadsheet

- Active Cell - the one that is selected
- Spreadsheet software allows the user to take control of numbers and manipulate them.
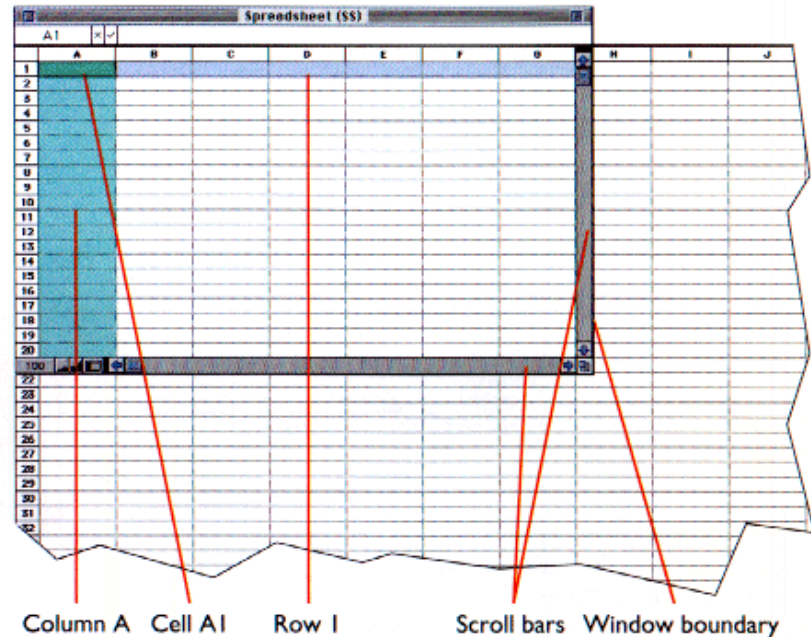

Column A   Cell A1   Row 1   Scroll bars   Window boundary

The worksheet may be bigger than what appears on your screen. You can scroll vertically and horizontally to view the larger matrix.

The Spreadsheet

Most popular spreadsheet programs include these features:

- Formulas
- Predefined functions
- Templates
- Charting capabilities

Internet Access Options

Internet Service Providers (ISPs)

– local ISPs provide connections through local telephone lines

– national ISPs offer connections on a nationwide scale

Nettiquette

- Rules of the E-mail
  - Spamming
    - Bulk, mass, or repeated identical messages

  - Flaming
    - Expresses a strong opinion or criticism. Can be insulting.

E-mail Addresses

An Internet e-mail address includes:
username@hostname.sub.dom

- **username** is the person's "mailbox"
- **hostname** is the name of the host computer and is followed by one or more domains separated by periods:
  - host.subdomain.domain
  - host.domain
  - host.subdomain.subdomain.domain

E-mail Addresses

Top level domains (the last part of the address) include:

- .edu - educational sites

- .com - commercial sites

- .gov - government sites

- .mil - military sites

- .net - network administration sites

- .org - nonprofit organizations

E-mail Addresses

Examples:

president@whitehouse.gov

User **President** whose mail is stored on the host **whitehouse** in the **government** domain
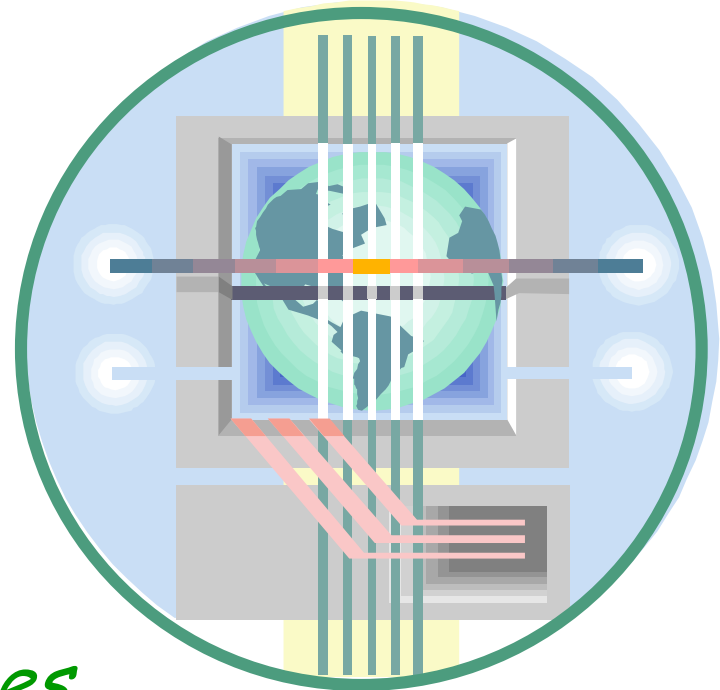
hazel_filbert@lane.k12.or.us

User **hazel_filbert** at the server for **Lane County, Oregon, k-12** school district

World Wide Web

Web browsers, such as **Internet Explorer** and **Netscape Navigator** are software that help locate information on the Web

Information is stored on *Web pages*

A group of Web pages make up a *Web site*

World Wide Web

Enter a Web page's unique address
(Uniform Resource Locator **URL**) to
go to the Web page

http://www.prenhall.com.beekman

Electronic Mail (e-mail)

"The great success of the Internet is not technical, but its human impact."

Dave Clark

Why did E-mail lure people to the Internet?

– Availability
  • software made it easy to use
– Speed
  • messages can be created and delivered in minutes

Browsing the Web

- **Hyperlinks (links)** are words or pictures that act as buttons, allowing you to go to another Web page

Links are typically underlined or displayed in a different color
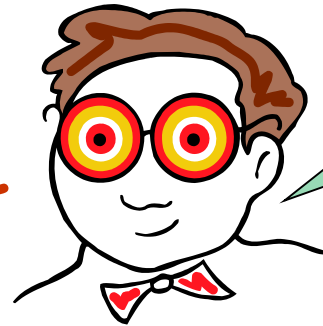
More on Browsing the Web

Web site Jargon

- **Links** allow you to locate information without knowing its exact location (it may move from time to time)

- **Back** and **Forward** buttons let you retrace your steps

- **Bookmarks** (or **Favorites**) can be set up to mark your favorite Web locations

Web Addresses

Go directly to any Web destination by typing its **URL** (Uniform Resource Locator)

Pronounced **Earl**...like the name

A typical URL looks like this:

http://www.prenhall.com.beekman

Web Addresses

Dissecting the address

The path to the resource on the host that contains the information

The protocol used to transfer Web pages across the Net

http://www.vote-smart.org/help/database.html

The domain name of the server containing the resource

Software Piracy and Intellectual Property Laws

- Software piracy is the illegal duplication of copyrighted software
- Shareware - try before you buy. Pay a fee
- Freeware

Software Piracy and Intellectual Property Laws

- Property laws:
  - Inventions are patented
  - Trade secrets are covered by contract law
  - The expression of intellectual property can be copyrighted
- Look-and-feel lawsuits can result from mimicking intellectual property

Software Sabotage

Sabotage of software can include a Trojan horse, virus, or worm

Often, all of these are referred to as a virus

Trojan horse:
performs a useful task while also being secretly destructive; time bombs are an example
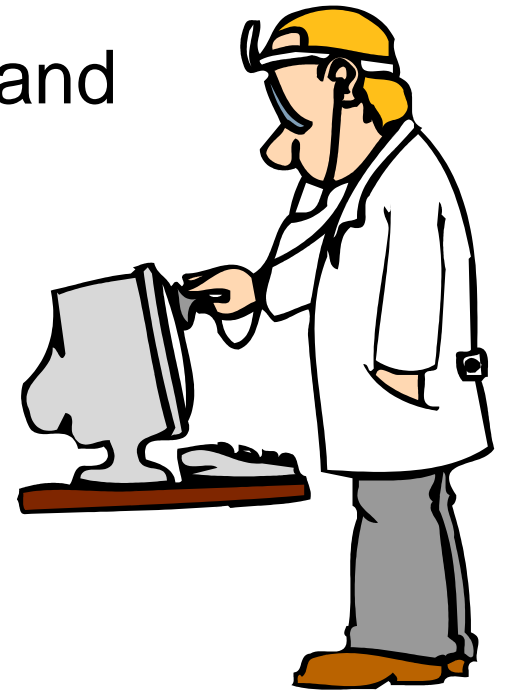
Virus:
spreads by making copies of itself from program to program or disk to disk

Worm:
a program that travels independently over computer networks, seeking uninfected sites

Software Sabotage

- Virus detection software can find and remove most viruses

  - These programs need to be frequently revised
  - More than 200 new virus appear each month!
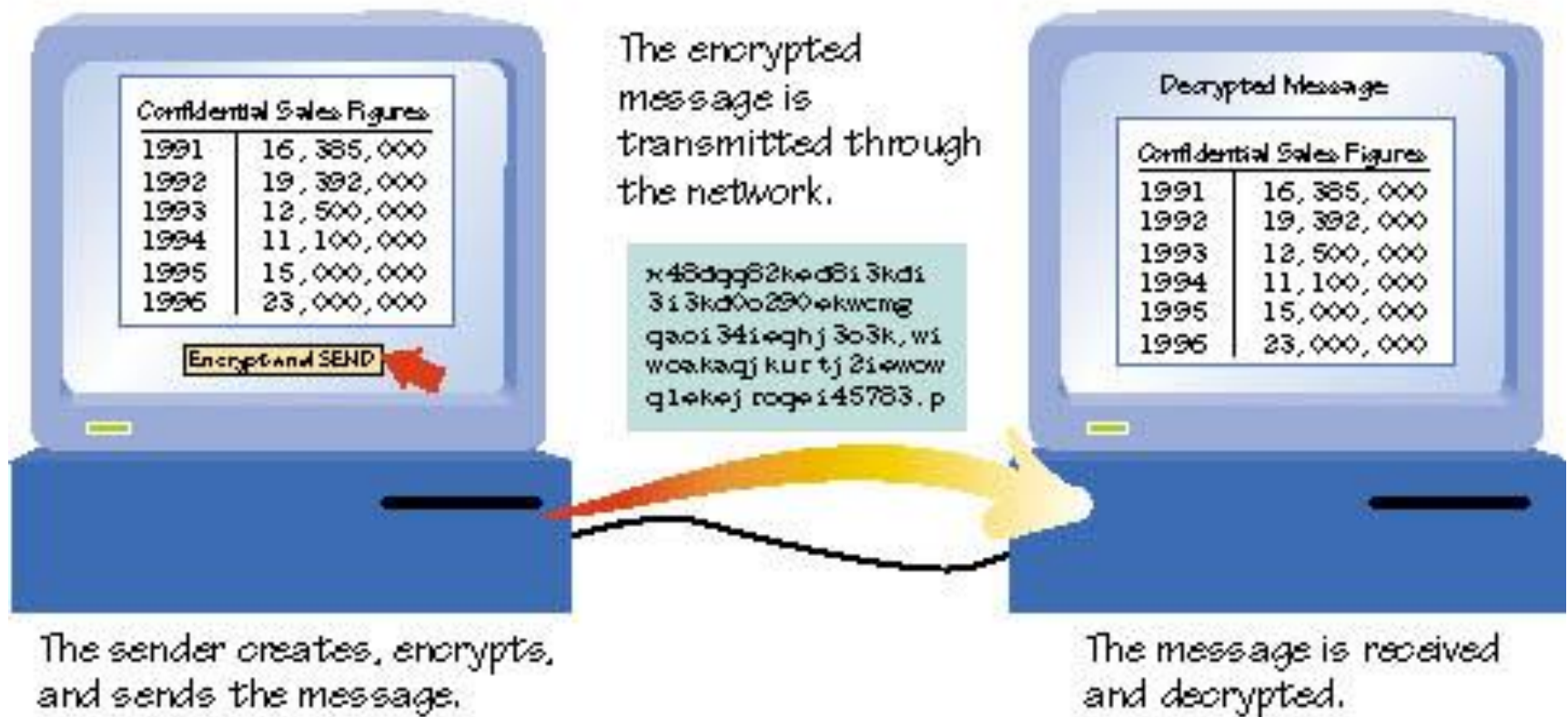
Hacking and Electronic Trespassing

Electronic trespassing

- Breaking into other computer systems is called *electronic trespassing*

- Electronic crime rings focus on stealing credit card numbers and other valuable information

Encryption

- To make a message secure from outsiders requires encryption software

- Encryption software scrambles the sent message using a key

- A different key is needed to unscramble the received message

Encryption

The sender creates, encrypts, and sends the message.

The encrypted message is transmitted through the network.

The message is received and decrypted.

Acceptable Use Policy

- Documents that govern the use of computers and networks owned by the company (or schools)