

## Computers:

By the end of this unit you should demonstrate a basic understanding of how computers work and computerize.

Describe how computers "think"

Describe the binary, on/off, nature of computers

RAM = Millions (often billions) of on/off switches

High/Low states

Reverse logic

Describe the sequential nature of computer processing

Describe computers speed of processing

Describe how computers group on/off's

Terminology: Bit, Nibble, Byte, Word, Longword

Binary math: LSb, MSb, LSN, MSN, LSB, MSB

Cipher and convert in Decimal, Binary, & Hexadecimal

Decimal = ten digits (0123456789). Each place = 10 times previous place

Binary = two digits (01). Each place = 2 times previous place

Useful for doing math with on/off switches

Hexadecimal = 16 digits (0123456789ABCDEF). Each place = 16 times previous place.

Useful for representing large numbers and Byte related numbers

Describe analog vs digital representation

Describe computer measurement terminology

Large (usually data units):

Deka = tens

Hecto = hundreds

Kilo = thousands

Mega = millions

Giga = billions

Tera = trillions

Peta = quadrillions

Exa = quintillion

Zetta = sextillion

Small (usually time)

Deci = tenth

Centi = hundredth

Milli = thousandths

Micro = millionths

Nano = billionths

Pico = trillionths

Femto = quadrillionths

Atto = quintillionths

Zepto = sextillionths

Describe the external architecture of a typical desktop computer system by part and function.

Main unit for processing information

Peripherals for communicating information with outside world

Typical I/O ports

Serial

Parallel

SCSI

USB (and USB 2.0)

Firewire (and Firewire 800) (sometimes called 1394)

Analog audio and video

ADB (old Macintosh)

input peripherals

Keyboard

Mouse, trackball, Joystick, Drawing slate, light pen, touchscreen

MIDI device

Scanner

Camera

output peripherals

Video Monitors (usually digital now)

1024 x 768 = 786432 pixels

each pixel controlled by 24 bits = 18,874,368 switches in video card

- Speakers
- Printers
- Special devices
- Equal input/output
- External storage device (ZIP, External HD, CDR, DVD-R)
- Ethernet
- Modem

Describe the basic internal architecture of a typical desktop main unit by part and function.

- Motherboard
  - Busses (wires that connect several electronic devices in a chain)
    - IDE
    - Nubus (extinct)
    - EIDE
    - PCI
    - ATA
    - AGP
  - Electronic parts
    - Simple single-function parts
      - Transistors
      - Diodes
      - Capacitors
      - Resistors
      - Transformers
    - Multi-part encapsulated circuits
      - Logic gates (for comparisons)
      - Integrated circuits (IC's, Chips)
      - Microprocessors
      - ASICs

- CPU
  - Architecture
    - ALU
    - Memory registers
  - CISC vs RISC
  - Intel (and AMD, etc.) vs Motorola

- Co-Processors
- Clock
- ROM
- RAM
- Slots
  - Open architecture vs Closed architecture
  - Cards

- I/O ports
  - Video
  - Audio
  - Keyboard/mouse/etc (ADB)
  - Serial
  - Parallel
  - SCSI
  - USB
  - Firewire

- Permanent storage media
  - Hard Drive
  - CD-ROM
  - Floppy
  - Zip, etc.

Power supply

Describe a computer's software levels

- BIOS
- OS

Basic functions  
 APIs  
 Interface  
 gui  
 Windows on PC  
 Finder on Mac  
 cli  
 Unix  
 Dos

Application  
 Document

Define common computer related terms.

0000	001	0101	0110	1000
1001	1111	480	601	604
6100	620	640	68000	680x0
AC	ADB	ALU	Amdahl	Analog
Application	ASIC	Baud	Binary	BIOS
Bit	Boot	Bus	Byte	CAD
CAM	Card	CDROM	Chip	CISC
Clock crystal	Closed architecture	Co-processor	CPU	Cray
Daughterboard	DC	Decimal	Digital	DIP
DOS	DPI	DSHD	Ethernet	Expansion board
Expansion card	FF	Finder	Five	Floppy disk
Giga	Gigabyte	Gigaflop	Hard disk	Hardware
Hex	Hexadecimal	High	IC	Inkjet
Integrated circuit	Intel	Interface	IO	Kilo
LAN	Laptop	Laser printer	Longword	Low
LSB	LSN	Main unit	Mainframe	Meg
Mega	MFLOP	MHz	Micro	Micro Computer
Microprocessor	MIDI	Milli	Mini Computer	MIPS
Modem	Monitor	Motherboard	Motorola	MSB
MSN	Multifinder	Multitask	Nano	Nibble
Online service	Open architecture	OS	Parallel port	Parallel processing
PC	Pentium	Peripheral	PGA	Pico
Pixel	Port	Power supply	PowerMac	PowerPC
Printer	RAM	Reverse logic	Ribbon cable	RISC
ROM	SCSI	Serial	Silicon	SIMM
Six	Slot	Socket	Software	Specmark
Supercomputer	SyQuest	System software	Tera	Unix
Video port	Virtual ram	Windows	Word	Workstation

Exemplify the influence of computers in contemporary American Life.

Computers (or at least microprocessors) are in everything.

Describe common uses of computers in contemporary music.

Sequencing  
 Audio editing  
 Synthesis & Voice editing  
 Note editing  
 Algorithmic composition  
 Multimedia production  
 Band charting  
 Record Keeping.  
 Communication  
 Education  
 Exploration

List and exemplify classes of computers by size, capacity, speed, & function.

Supercomputer  
 Mainframe  
 Workstation (minicomputer)  
 Personal computer (microcomputer, desktop)  
 Laptop  
 PDA  
 Turnkey (special purpose) computers