Guided Exercise 1: Computer assembling/disassembling *(Model Unit - DELL OptiPlex 740)*

Instructions: Given the general overview of the model unit, disassemble some of the major parts by following these steps. After disassembling the parts, put back all removed parts to its original position.

Computer hardware acronyms

BIOS - Basic Input-Output Services. BIOS contains the most basic information needed by the computer at the hardware level, how to boot up, and how to find the rest of its parts.

CPU - The Central Processing Unit, Microprocessor, or simply Processor.

RAM/ROM - Random-Access Memory. This is a memory that's writable by the system and by programs, that store's information while it is needed for running the system and for the execution of programs. Read-Only Memory. This memory is not easily writable. It consists of information that is necessary for the system or component to operate, which is usually called an "instruction set."

AGP - Accelerated Graphics Port. A type of video interface introduced in 1996 as an improvement to PCI. It has now been largely replaced by PCI-e.

PCI/PCIe - Peripheral Component Interconnect. One of the expansion interfaces that replaced ISA. Many devices are still available for PCI, and most motherboards still contain at least one or two PCI slots. But slowly, PCI is being replaced by PCIe. Peripheral Component Interconnect Express. A newer expansion interface designed to replace the PCI, PCI-X, and AGP interfaces.

ISA - Industry Standard Architecture. An obsolete expansion interface, which began to be replaced by PCI and AGP in the mid-1990's.

HDD - Hard Disk Drive. An array of magnetic disks that store data until it is intentionally deleted by the user, the system, or a program.

IDE - Integrated Device Electronics.

ATA/SATA/SSD - Advance technology Attachment (also known as IDE). Serial Advanced Technology Attachment. A faster, more reliable interface designed to replace the older PATA technology used to connect ATA hard drives to the computer's motherboard.Solid State Drive. A mass-storage device with no moving parts, which stores data in arrays of flash memory. Better-quality ones have better data access speed than hard disk drives. In addition, because they are not sequential devices, there is no degradation of access speed when the drives become fragmented. However, SSDs are more expensive the HDDs, have a limited duty life, and may be difficult to recover data from in the event of failure.

MOTHERBOARD -Alternatively referred to as the mb, mainboard, mobo, mobd, backplane board,base board, main circuit board, planar board, system board, or a logic board on Apple computers. The motherboard is a printed circuit board that is the foundation of a computer, located at the bottom of the computer case. It allocates power to the CPU, RAM, and all other computer hardware components. Most importantly, the motherboard allows hardware components to communicate with one another.

G/GHZ - Short for gigahertz, GHz is a unit of measurement for alternating current (AC) or electromagnetic (EM) wave frequencies equal to 1,000,000,000 Hz.
when referring to a computer processor or CPU, GHz is a clock frequency, also known as a clock rate or clock speed, representing a cycle of time. An oscillator circuit supplies a small amount of electricity to a crystal each second that is measured in KHz, MHz, or GHz. "Hz" is an abbreviation of Hertz, and "K" represents Kilo (thousand), "M" represents Mega (million), and "G" represents Giga (thousand million). In general, the higher the GHz number for a processor, the faster the processor can run and process data. The first 1 GHz processors for consumer computers were released in March of 2000 by AMD and Intel. Today, processors are reaching higher speeds.

DDR - Double Data Rate. A type of memory that sends and receives data twice every clock cycle, and therefore is capable of twice the data transfer rate of standard SDRAM.

LCD/LED - Liquid Crystal Display. A type of solid-state display technology used in computer monitors and other electronic displays.

Light-Emitting Diode. A semiconductor that emits light. Often used for indicator lights, panel lights, and to illuminate LED computer monitors.

SIMM/DIMM - Single In-Line Memory Module. An obsolete type of memory chip that used a 32-bit bus, as compared to DIMM chips, which use a 64-bit bus. Dual In-Line Memory Module.

LAN - Local Area Network. Network cards are sometimes referred to as "LAN cards" or "LAN interfaces."

1. Front view of the Computer model
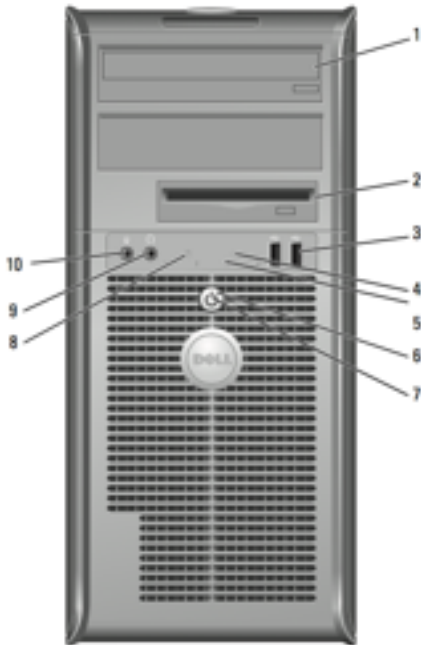
1. Optical drive
2. FlexBay drive (optional)
3. USB 2 connectors
4. LAN indicator light
5. Diagnostic light
6. Power button
7. Power light
8. Hard drive activity light
9. Headphone connector
10. Microphone connector

2. Back view of the Computer model
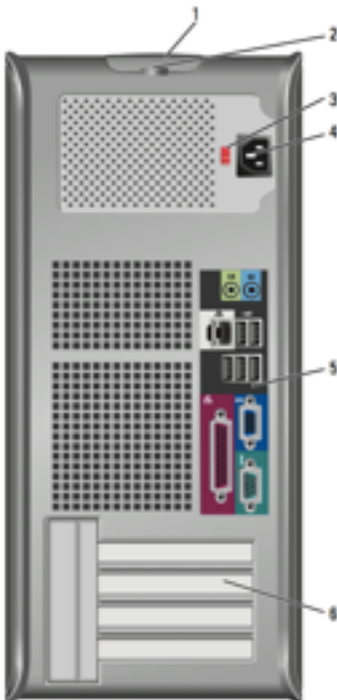
1. Cover release latch
2. Padlock ring
3. Voltage selection switch *(never switch to 110V)*
4. Power connector
5. Back-Panel connectors
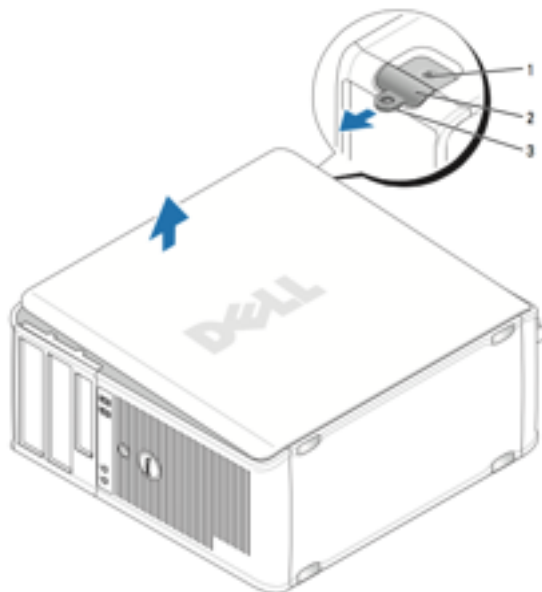6. Card slots

3. Back-panel connectors
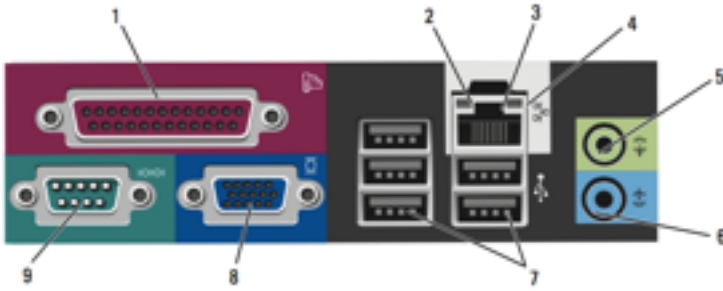
1. Parallel connector

2. Link integrity light (orange)

3. Network adapter connector

4. Network activity light (green)

5. Line-Out connector

6. Line-In connector

7. USB 2 connectors (5)

8. Video connector

9. Serial connector

4. Removing the computer cover.
a. Lay the computer on its side as shown in the illustration.

1. Security cable slot

2. Cover release latch

3. Padlock ring

Using a paint brush, clean the internal parts of the computer unit outside of the classroom.
Wear your mask and globes.
To remove static from your body, touch any unpainted part of the computer case.

b. Locate the cover release latch shown in the illustration. Then, slide the release latch back as you lift the cover.

c. Grip the sides of the computer cover and pivot the cover up using the hinge tabs as leverage points.

d. Remove the cover from the hinge tabs and set it aside on a surface.

5. System Board components
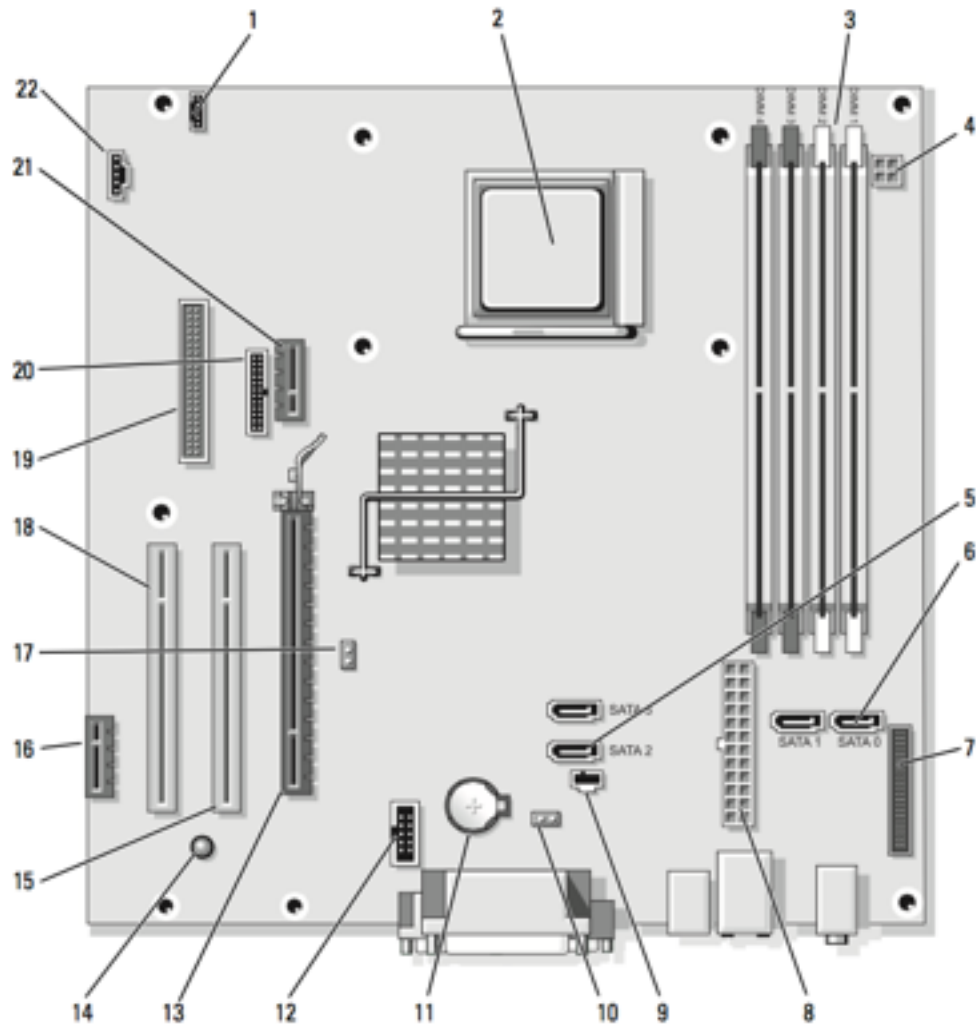
1. Speaker connector (INT_SPKR)

2. Processor socket (CPU)

3. Memory module connectors (DIMM_1, DIMM_2, DIMM_3, DIMM_4)

4. Power connector (PW_12V_A1)

5. SATA drive connectors (SATA2, SATA3)

6. SATA drive connectors (SATA0, SATA1)

7. Front-panel connector (FRONTPANEL)

8. Power connector (POWER1)

9. Intrusion switch connector (INTRUDER)

10. CMOS reset jumper (RTCRST)

11. Battery socket (BATTERY)

12. Internal USB (USB1)

13. PCI Express x16 connector (SLOT1)

14. Standby power (AUX_PWR_LED)

15. PCI connector (SLOT2)

16. PCI Express x1 connector (SLOT4)

17. Password jumper (PSWD)

18. PCI connector (SLOT3)

19. Floppy drive connector (DSKT)

20. Serial connector (PS2/SER2)

21. Optional DVI-card connector (DVI_HDR)

22. Fan connector (FAN_CPU)

Note: *Some of the acronyms which were not discussed from the previous session can be search from the Internet.*

6. Removing, installing & replacing drives (Optical and Hard drives)

Your Computer supports:

One SATA hard drive, one second SATA drive & one optional optical (CD/DVD) drive.
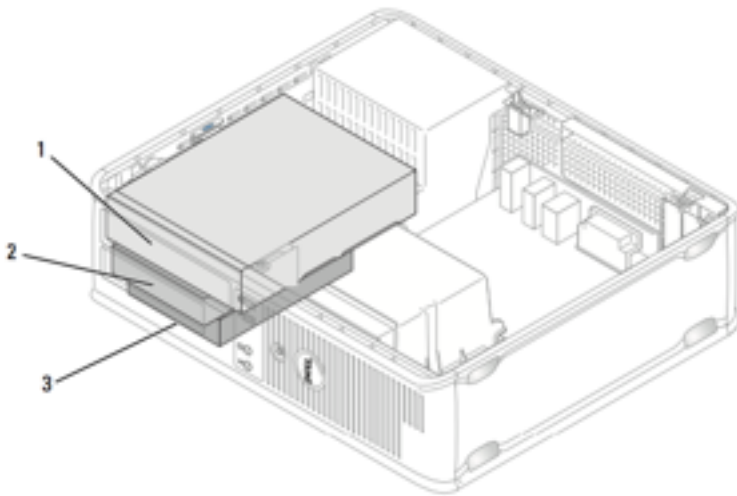
1. Optical Drive

2. Second SATA drive

3. First SATA drive

General installation guidelines:

Connect the 1st SATA hard drive to the connector labeled "SATA0." Connect the SATA CD or DVD optical drives to the connector labeled "SATA1" on the system board. Connect a second optional hard drive to the connector labeled "SATA2."
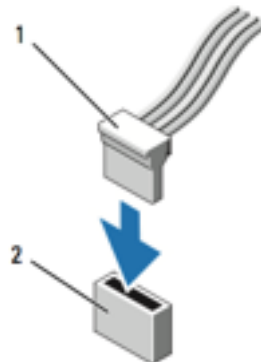
Connecting drive cables

When you install a drive, you connect two cables, a DC power cable and a data cable to the back of the drive and to the system board.
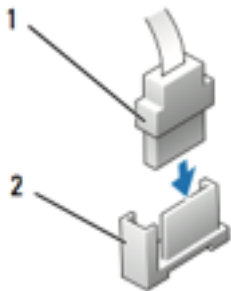
Drive interface connectors

Serial ATA connector

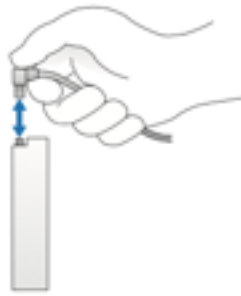1. Interface cable connector

2. Interface connector

Power cable connectors

Serial ATA power connector
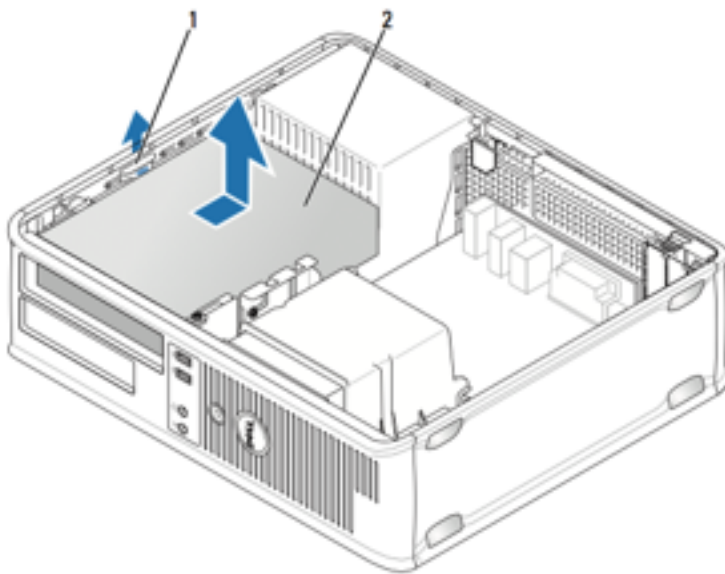
1. Power cable

2. Power input connector

Connecting and Disconnecting drive cables

When connecting and disconnecting a SATA data cable, hold the cable by the black connector at each end.

Removing an optical drive (CD/DVD)

1. Pull up on the drive release latch and slide the drive towards the back of the computer. Then lift up to remove the drive from the computer.
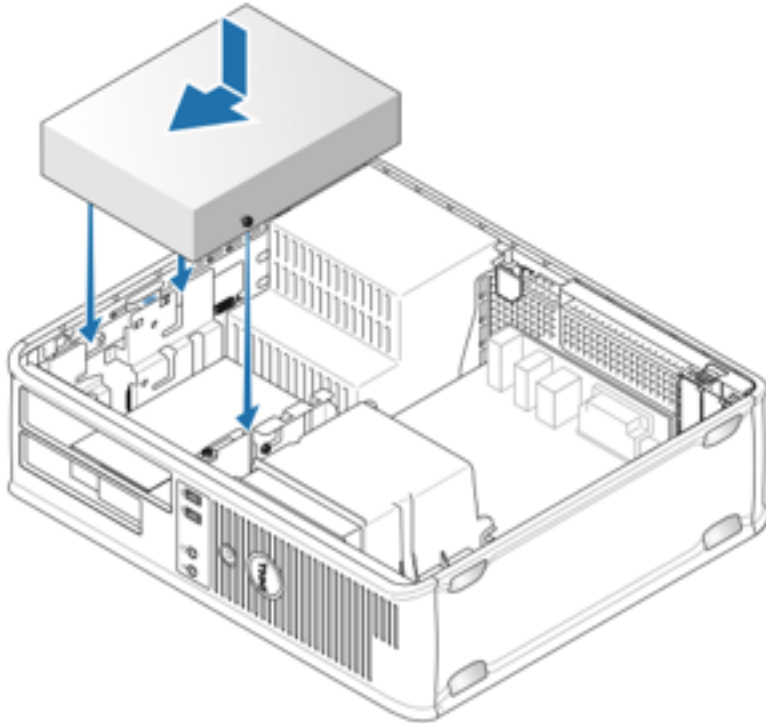

1. Drive release latch
2. Optical drive

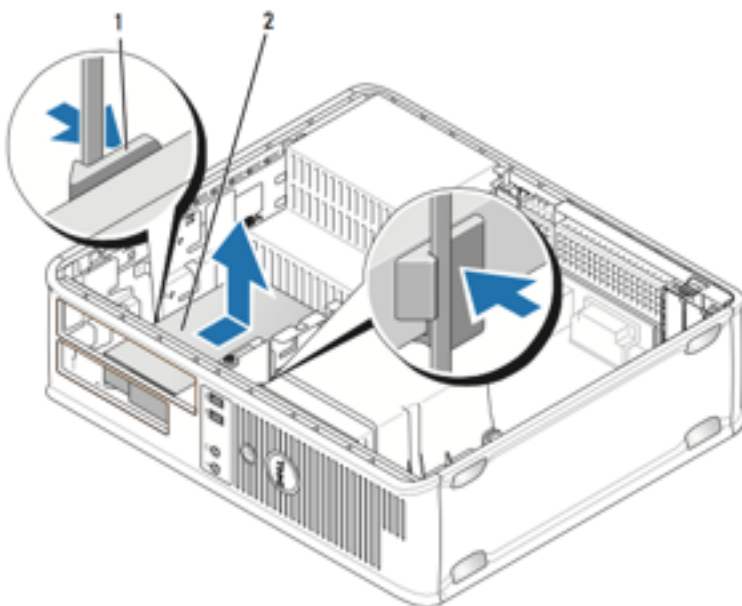2. Disconnect the power and data cables from the back of the drive.

Installing and/or replacing optical drive (CD/DVD)

1. Connect the power and data cables to the drive.

2. Align the shoulder screws with the screw guides, and slide the drive into the bay until it clicks into place.

Removing a hard drive

1. Remove the optical drive from the bay and carefully et it aside.

2. Squeeze the two plastic securing clips on each side of the hard drive and slide the drive towards the back of the computer.
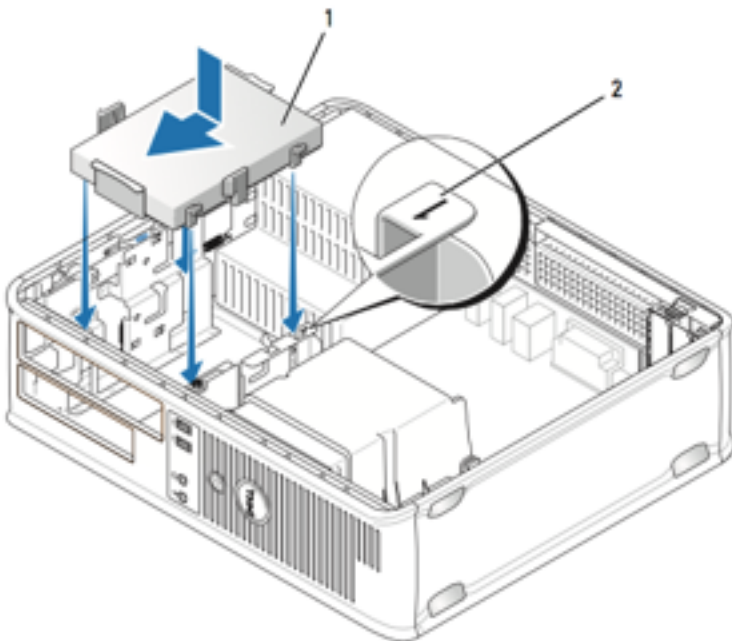
1. Securing clips
2. Hard drive

3. Lift the drive out of the computer and disconnect the power and hard-drive cables from the drive.
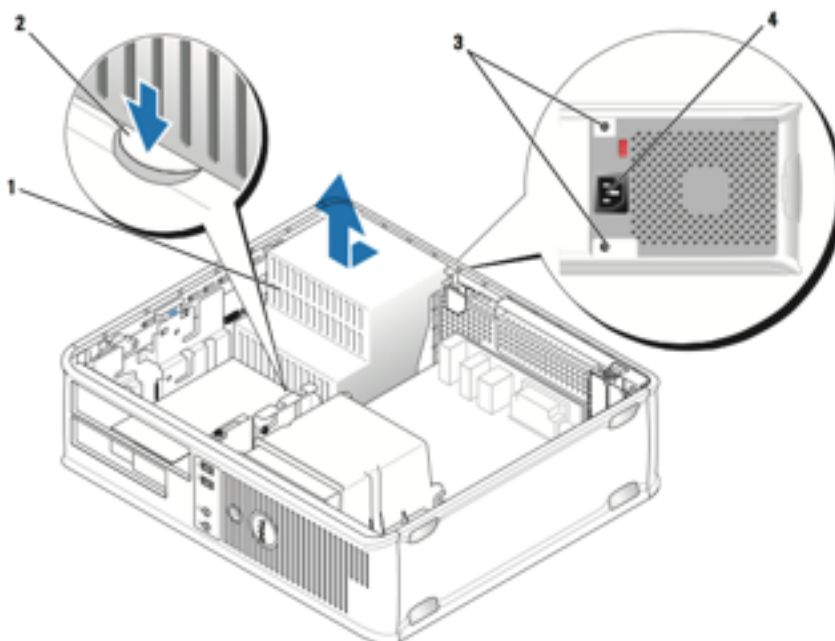
Installing and/or replacing a hard drive

1. Connect the power and data cables to the drive

2. Locate the correct slot for the drive, and slide the drive into the bay until it clicks into place.

1. Hard drive

2. Slot verification number

7. Removing and /or replacing the power supply.

1.Power supply

2. Release button

3. Screws (2)

4. AC power connector

1. Disconnect the DC power cables from the system board and the drives.

2. Remove the screws that attach the power supply to the back of the computer chassis.

3. Press the release button located on the floor of the computer chassis.

4. Slide the power supply toward the front of the computer by approximately 1 inch.

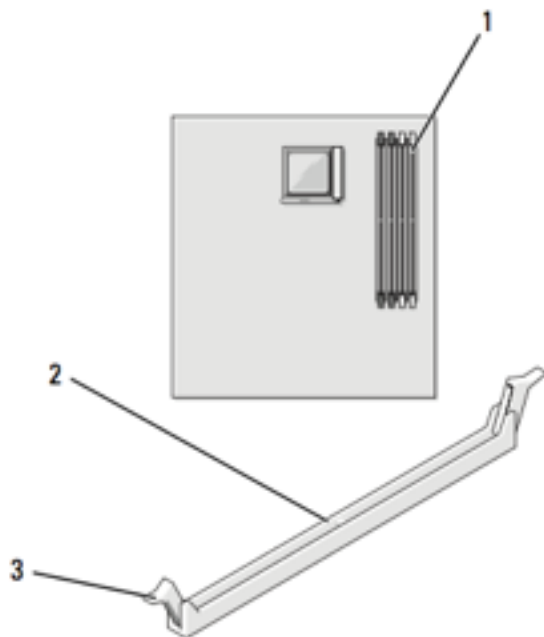5. Lift the power supply up and out of the computer.

8. Removing memory

1. Remove the optical drive first.

2. Carefully press out the securing clip at each end of the memory module connector.
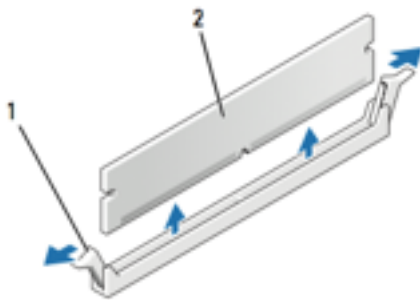
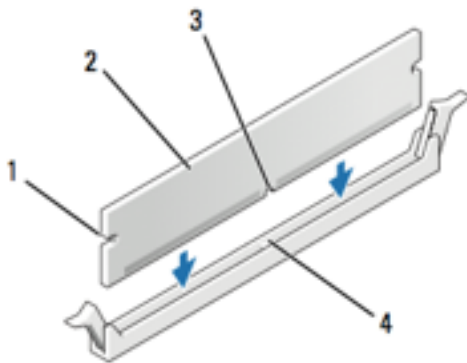1. Securing clips (2)
2. Memory module

9. Installing memory

1. Remove the optical drive first.

2. Press out the securing clip at each end of the memory module connector.

1. Memory connector closest to processor
2. Connector
3. Securing clips (2)

3. Align the notch on the bottom of the module with the crossbar in the connector.

1. Cut outs (2)

2. Memory module

3. Notch

4. Cross bar

4. Insert the module into the connector until the module snaps into position.

Note: *If you insert the module correctly, the securing clips snap into the cutouts at each end of the module.*

* Repeat the procedure several times until each one of you has mastered the basic Computer assembling and disassembling techniques.

* Take turns in doing this activity, other members of the group will observe and provide assistance whenever needed.