Draft

KEMENTERIAN PELAJARAN MALAYSIA

INFORMATION AND COMMUNICATION TECHNOLOGY

LEARNING MODULE

COMPUTER NETWORKS AND COMMUNICATIONS
SETTING NETWORK FACILITIES MODULE

Pusat Perkembangan Kurikulum
Kementerian Pelajaran Malaysia
2006

1. What is it?

This is a learning module for a specific Learning Outcome as stipulated in the Curriculum Specifications that is :

- 3.4 Setting Network Facilities

2. Who is it for?

This module is for students who are taking the ICT subject as their elective and for those who are interested in ICT.

3. What can be achieved?

Upon completion of this module, you will be able to :

- install Network Interface Card (NIC).
- crimp and test straight cable and crossed cable.
- configure and test network.
- communicate and share data through network.

4. Is previous knowledge necessary?

Yes. Before using this module, you should have learnt about basic concept of a computer network, hardware requirements and software requirements.

TOPIC: 3.4 SETTING NETWORK FACILITIES

DURATION: 12 periods

REFERENCES

A. Books:

Gary B. Shelly, Thomas J. Cashman, Misty E. Vermaat (2005), "Discovering Computers 2006: A Gateway To Information", Thomson Course Technology

Tamara Dean (2000), "Network + Guide to Networks", Thomson Course Technology

B. Website addresses:

http://myschoolnet.ppk.kpm.my
http://www.lanshack.com
http://www.homenethelp.com
http://www.crossover.asp
http://www.microsoft.com/technet/prodtechnol/winxppro/maintain/filesharing.mspx

THINGS YOU NEED TO KNOW

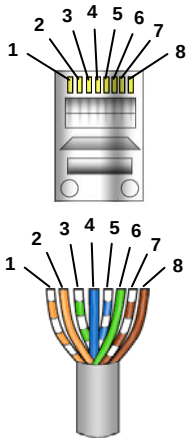
Pair	Wire	Pin	Diagrams
White/Blue	White/Blue	5	
	Blue	4	
White/Orange	White/Orange	1	
	Orange	2	
White/Green	White/Green	3	
	Green	6	
White/Brown	White/Brown	7	
	Brown	8	

Table 1: 568B Wiring Schematic

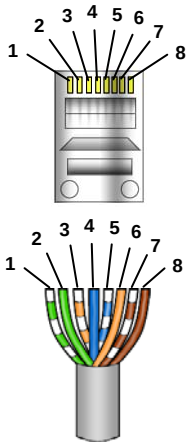
Pair	Wire	Pin	Diagrams
White/Blue	White/Blue	5	
	Blue	4	
White/Green	White/ Green	1	
	Green	2	
White/Orange	White/Orange	3	
	Orange	6	
White/Brown	White/Brown	7	
	Brown	8	

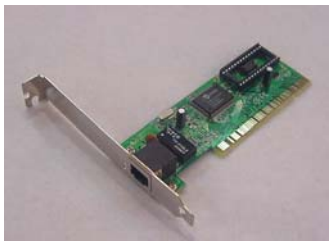
Table 2: 568A Wiring Schematic

Notes:

1. For patch cables, 568B wiring is the most common schematic.
2. There is no difference in connectivity between 568B and 568A cables. Either wiring should work fine on any system.
3. For a straight through cable, both ends use the same wiring schematics (568B wiring schematic is recommended).
4. For a crossover cable, both ends use **different** wiring schematics.

THINGS YOU NEED TO HAVE

HARDWARE

	Requirements	Sample
1	Network Interface Card (NIC)	
2	NIC driver	
3	Switch / Hub	
4	CAT5E cable (UTP cable)	
5	RJ45 connectors	

6	LAN cable tester	
7	Crimp tool	
8	Cable stripper	
9	Cutter	
10	Screwdrivers	

INSTALLATION OF NETWORK INTERFACE CARDS (NIC)

LEARNING OUTCOME: 3.4.1.1 Insert Network Interface Cards (NIC)
3.4.1.2 Install drivers for the NIC

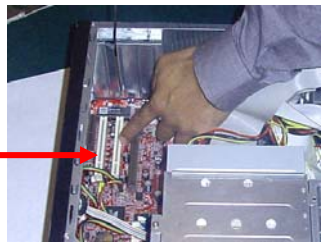
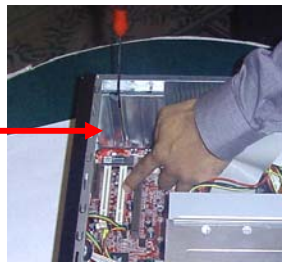
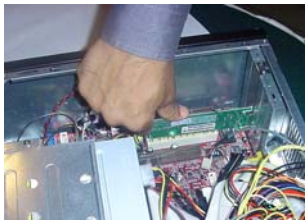
DURATION: 2 periods

REQUIREMENTS: Network Interface Card (NIC)
NIC driver
Screwdriver

In this module you will learn how to install *Peripheral Component Interconnect* (PCI) Network Interface Card into a personal computer (PC) and install the driver for the card.

ACTIVITIES:

A) INSERT NETWORK INTERFACE CARDS (NIC)

1. Turn off the PC and unplug the power cable. It is to make sure to neutralize any static electric in PC.	
2. Remove the casing of the PC.	
3. Locate an empty PCI bus expansion slot in the motherboard.	
4. Remove a back panel plate that corresponds to the expansion slot.	
5. Insert the NIC into the empty PCI bus expansion slot. Make sure the NIC is inserted properly and levelled. 6. Screw the NIC to back panel.	

7. Reaffix the casing of the PC.	

B) INSTALL DRIVERS FOR THE NIC

PART 1 : Check for installed NIC

Windows XP will automatically detect and install most network interface card drivers, so your drivers are likely already installed. You can check whether the driver has been installed or not, using the method below.

1. Click **Start**, then go to **Settings**. Click **Control Panel** (**Figure 1**).

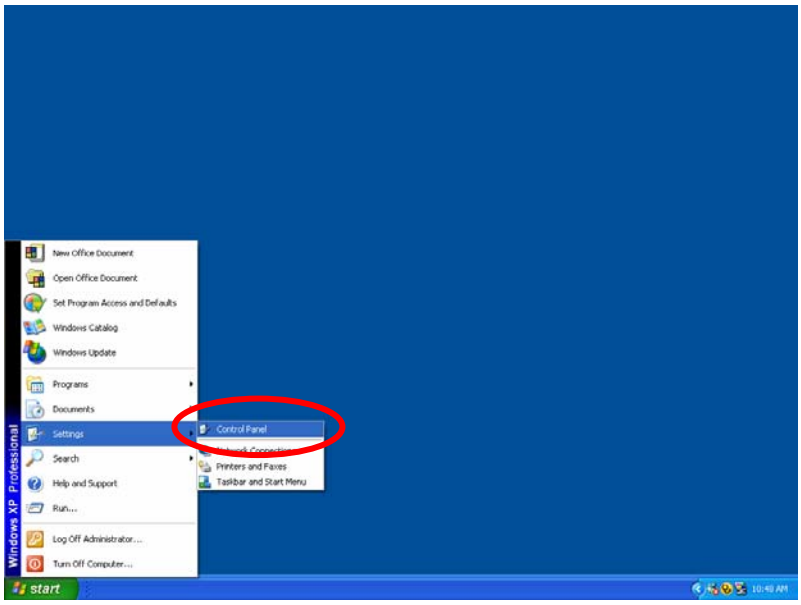


Figure 1

2. Click **Network and Internet Connections** (**Figure 2**).

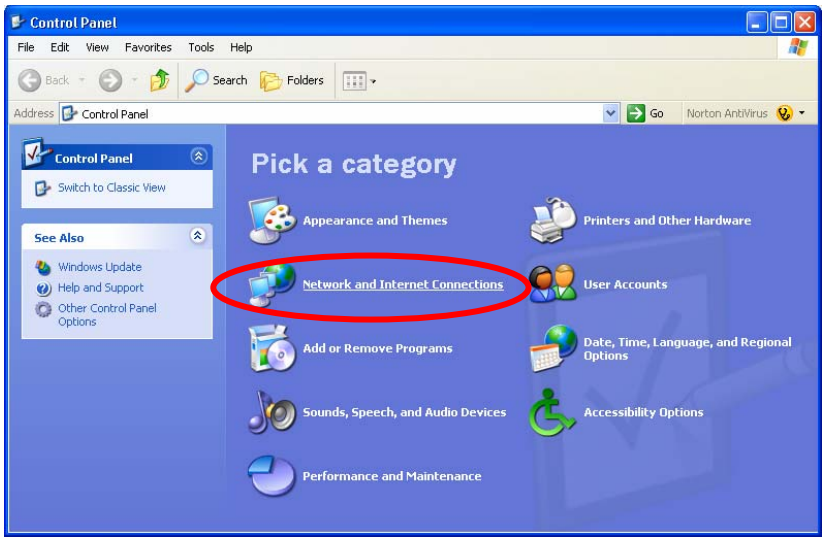


Figure 2

3. Click **Network Connections** (**Figure 3**).

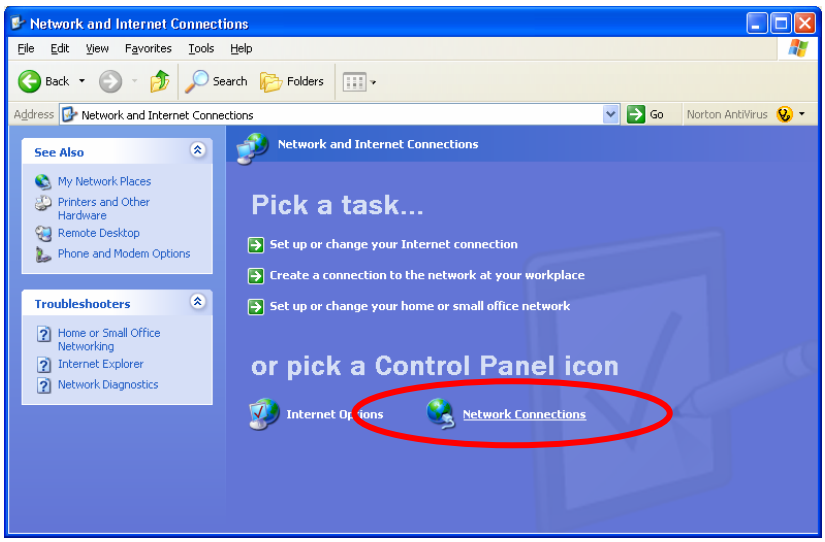


Figure 3

4. Highlight **Local Area Connection** icon. Go to **File** menu. Click **Properties**. (**Figure 4**).

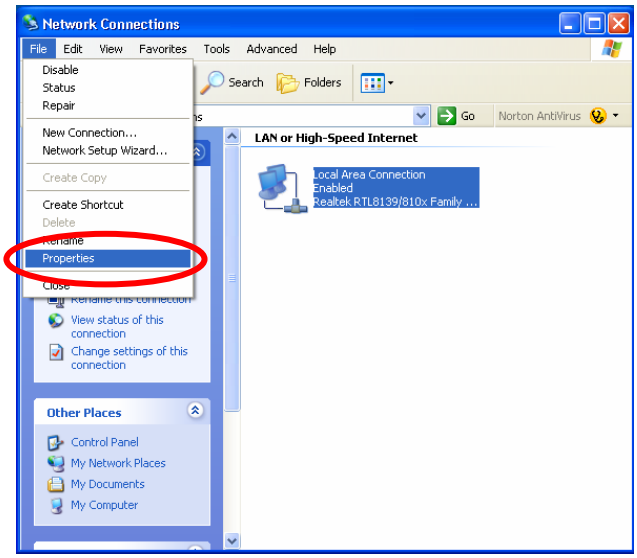


Figure 4

5. Your NIC should be listed under **Connect Using**. **Figure 5** showing a NIC is already installed.

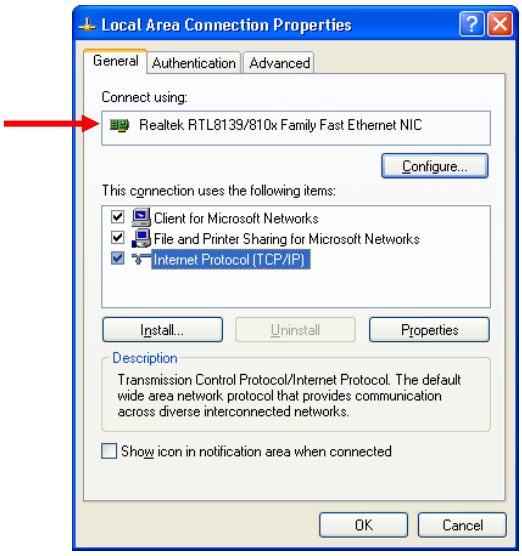


Figure 5

6. If the driver is already installed, skip Part 2 and you are ready for the assessment.

7. If there is no network card listed, click **Cancel** and start Part 2 to install the driver manually.

PART 2 : Install Drivers For Windows XP

1. Click **Start**, then go to **Settings**. Click **Control Panel** (**Figure 1**).

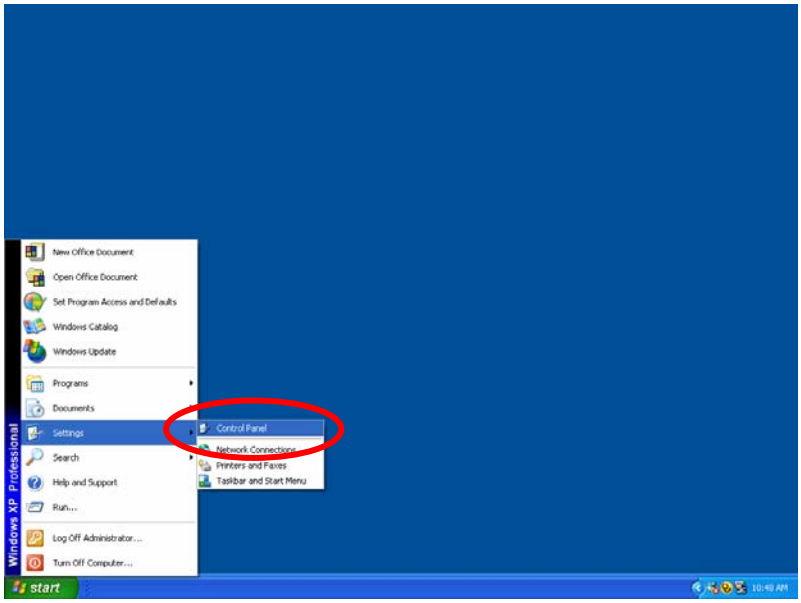


Figure 1

2. Click **Printers and Other Hardware** (**Figure 2**).

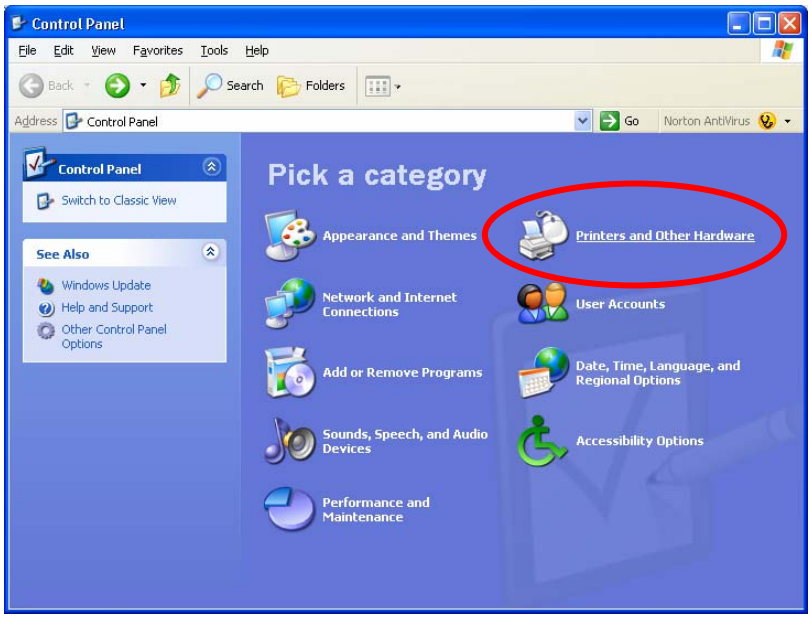


Figure 2

3. Click **Add Hardware** (**Figure 3**).

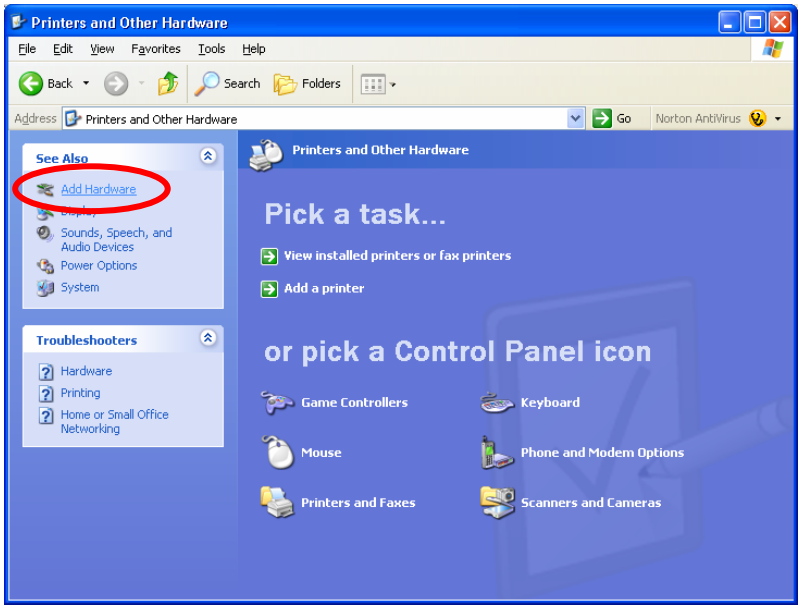


Figure 3

4. Click **Next** to start the installation of the NIC driver (**Figure 4**).

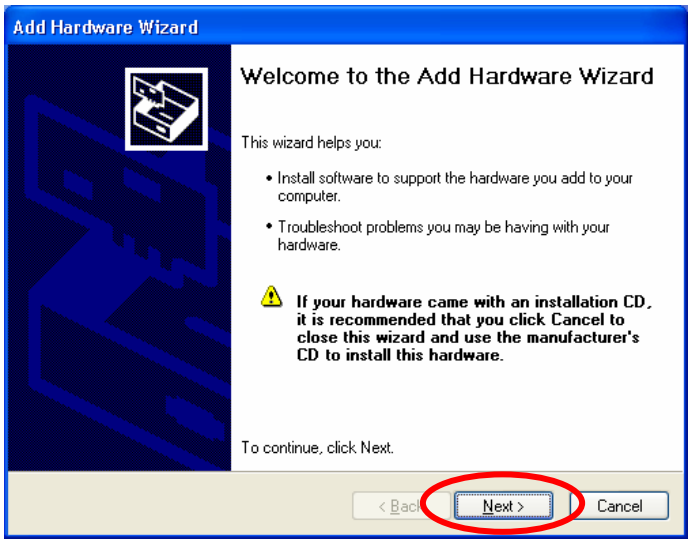


Figure 4

5. A window searching for new hardware will appear (**Figure 5**).

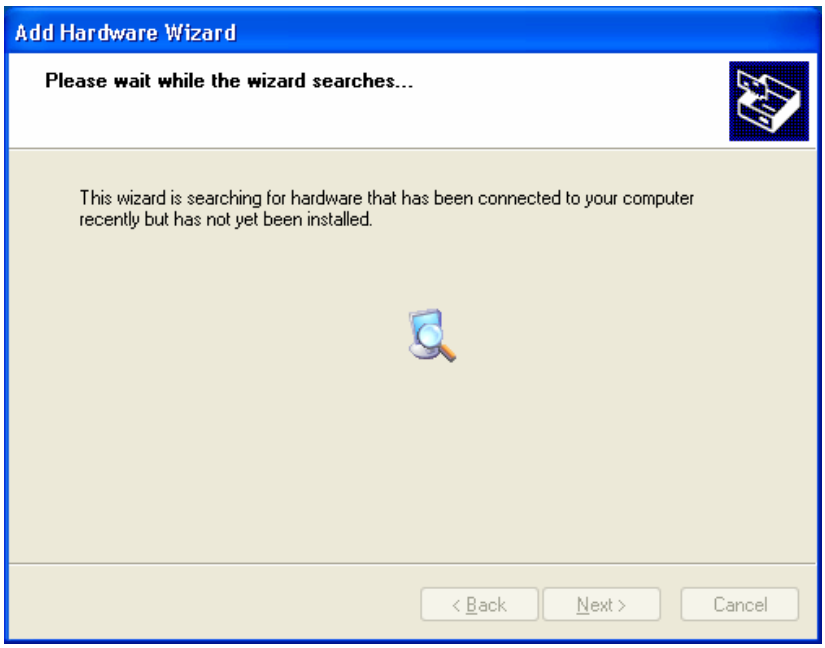


Figure 5

6. Check **Yes, I have already connected the hardware** and click **Next** (**Figure 6**).

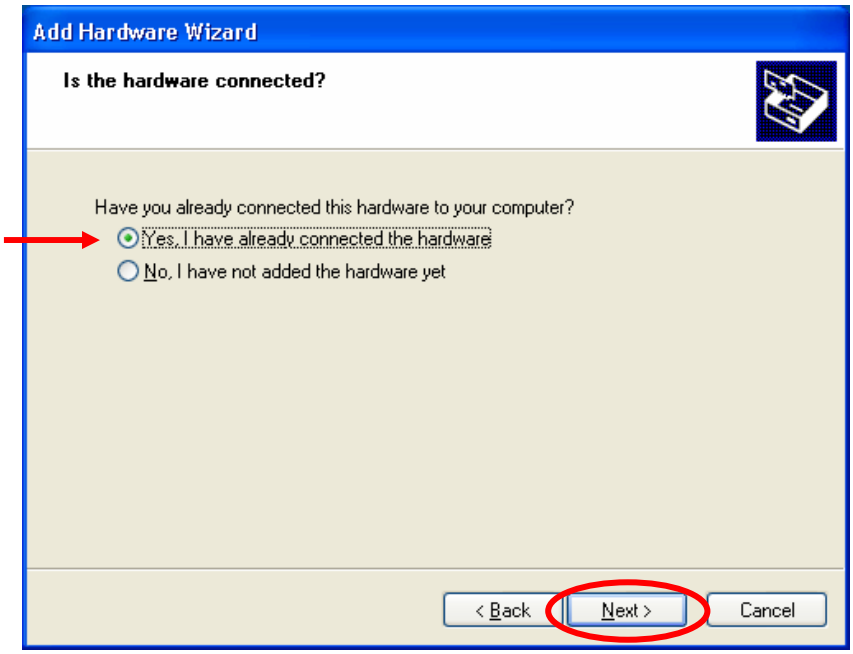


Figure 6

7. Scroll down and highlight **Add a new hardware device**. Click **Next** (**Figure 7**).

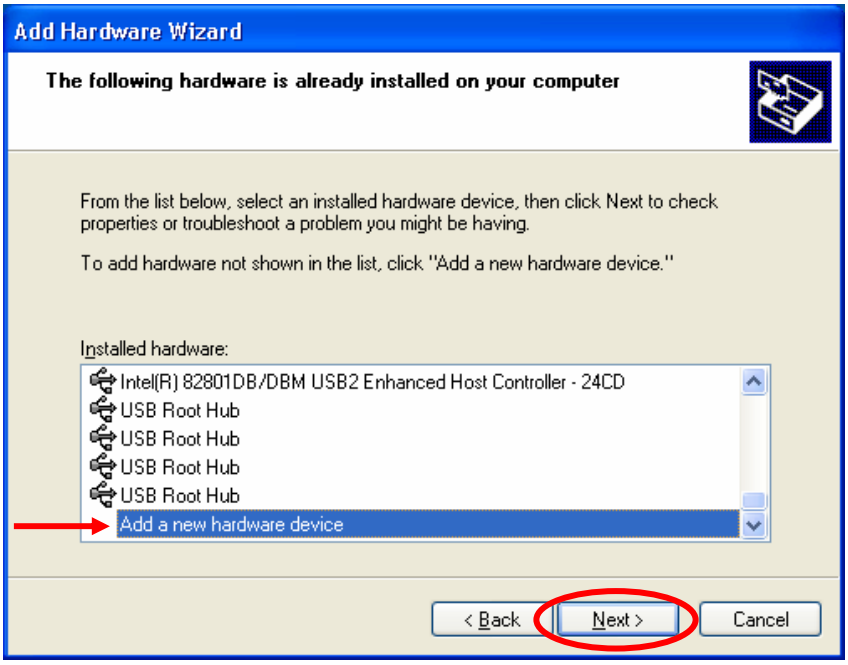


Figure 7

8. Check **Install the hardware that I manually select from a list (Advanced)** and click **Next** (**Figure 8**).

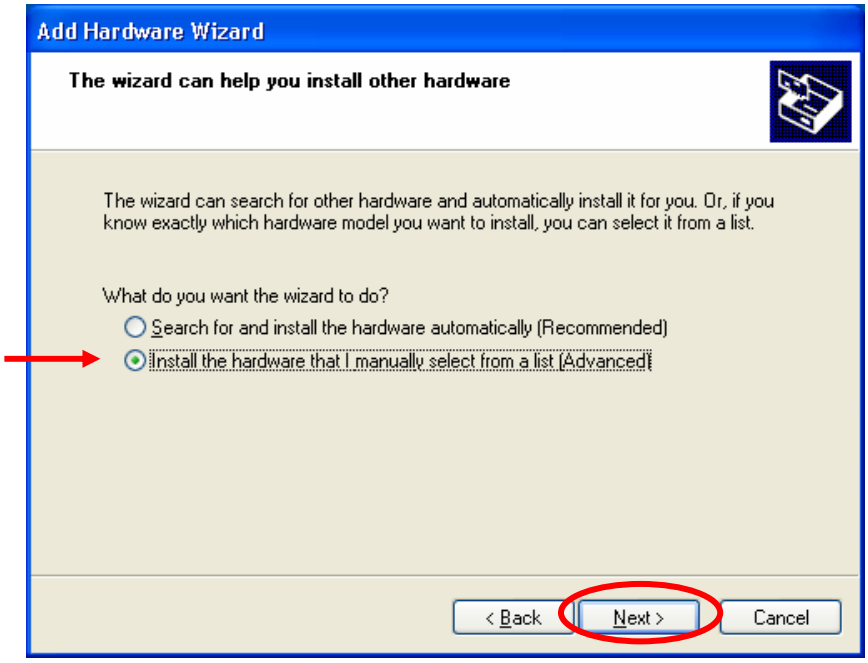


Figure 8

9. Scroll down and highlight **Network adapters**. Click **Next**. (**Figure 9**).

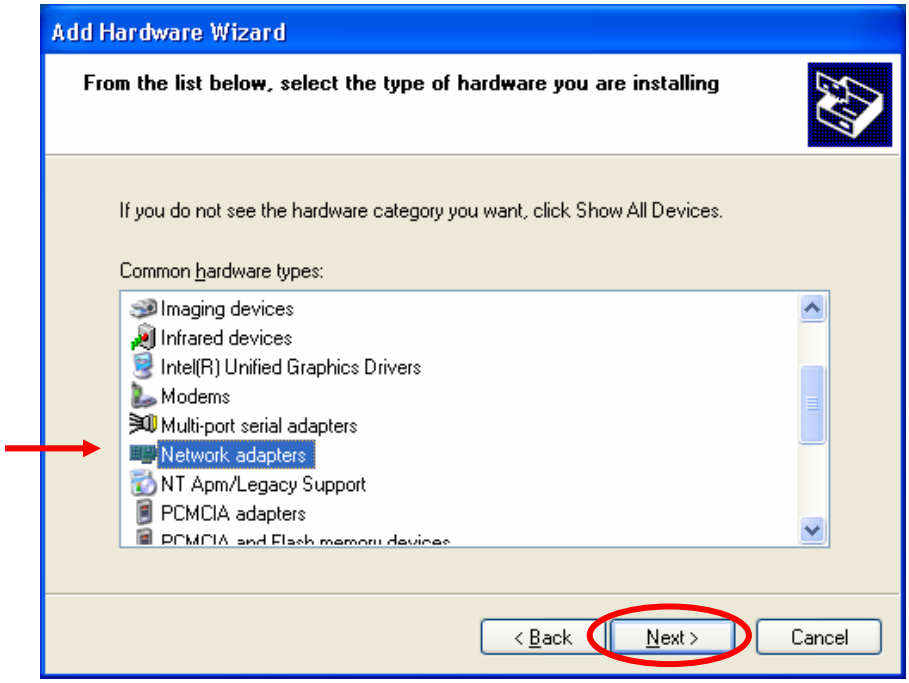


Figure 9

10. Insert the floppy disk or CD-ROM which contains the driver and click **Have Disk** (**Figure 10**).

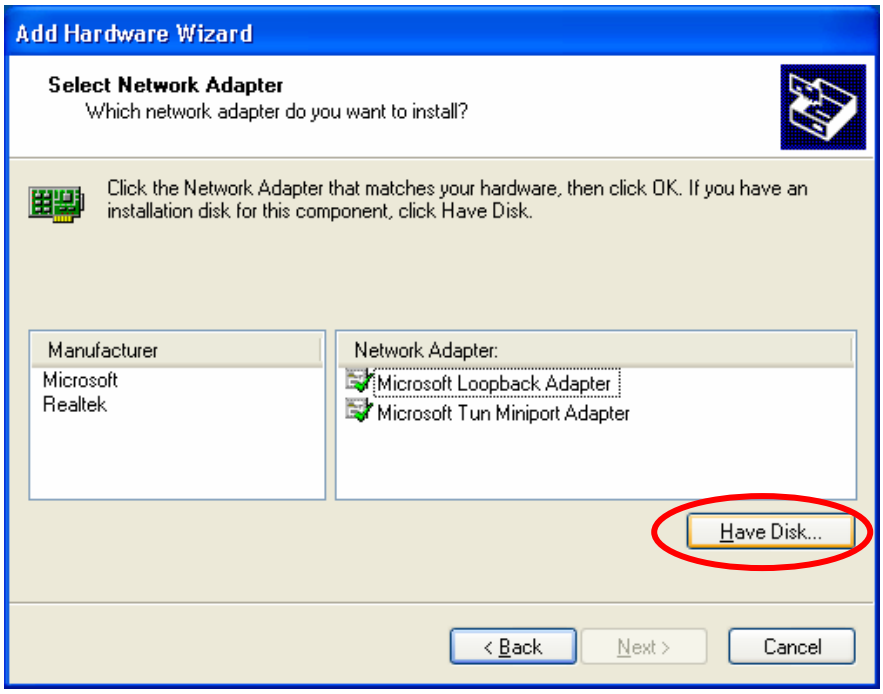


Figure 10

11. Click **Browse** (**Figure 11**).

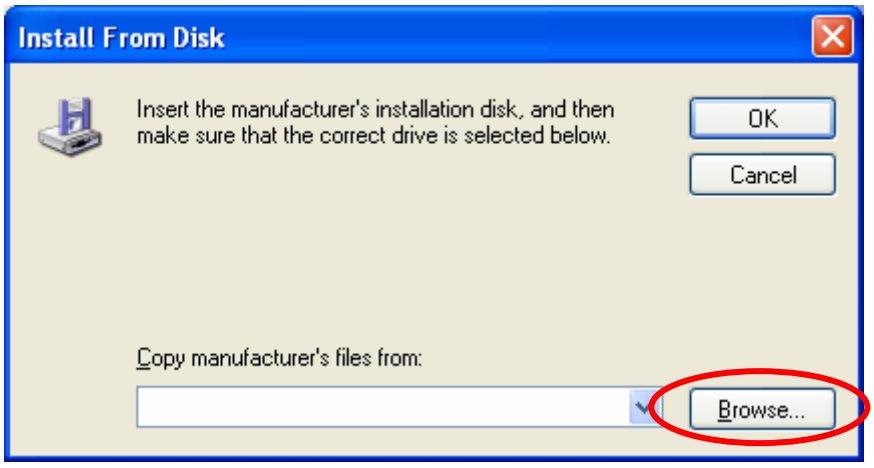


Figure 11

12. A **Locate File** window appears (**Figure 12**).

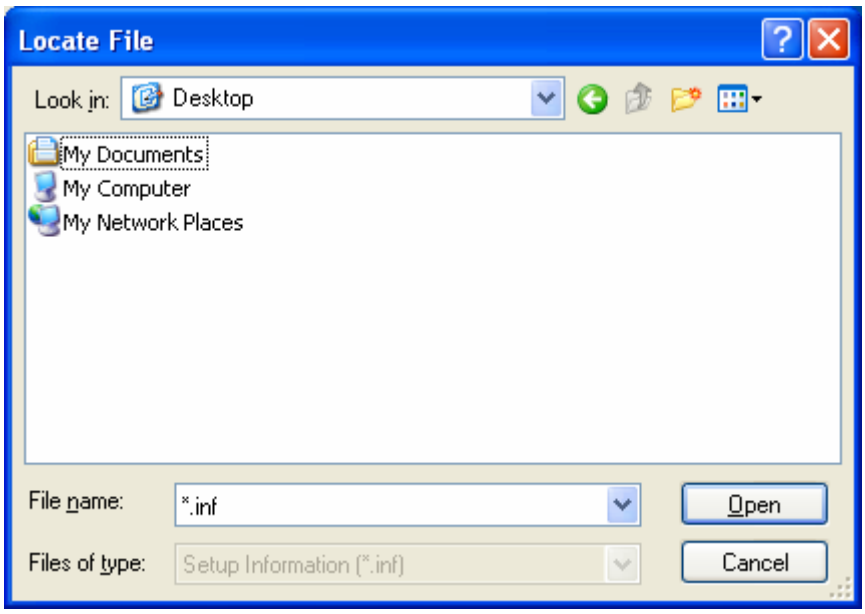


Figure 12

13. In **Look in** pull down menu, choose a device contains the driver and click it. **Figure 13** showing **CD Drive(E:)** as an example.

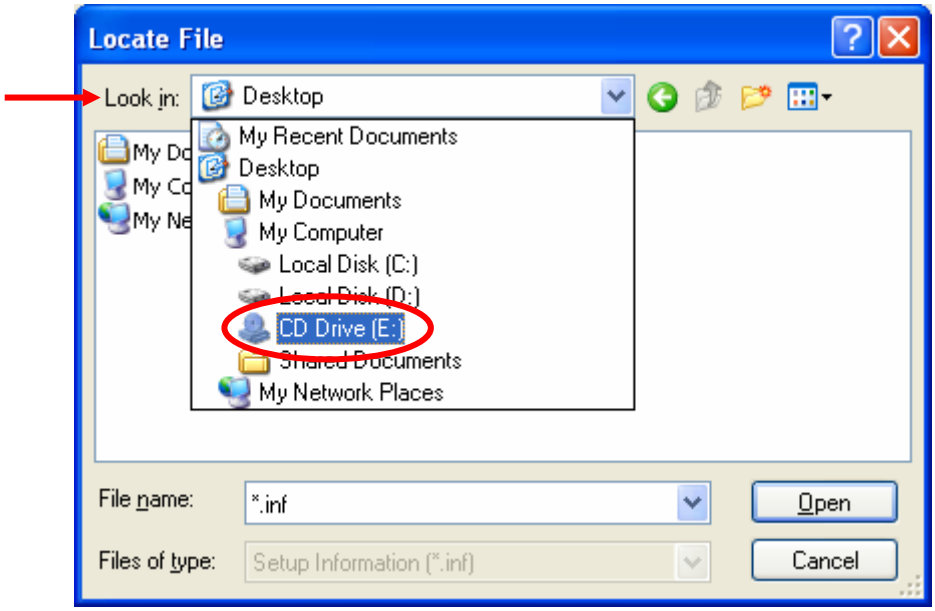


Figure 13

14. Highlight corresponds file and click **Open**. **Figure 14** shows **winxp** as an example.

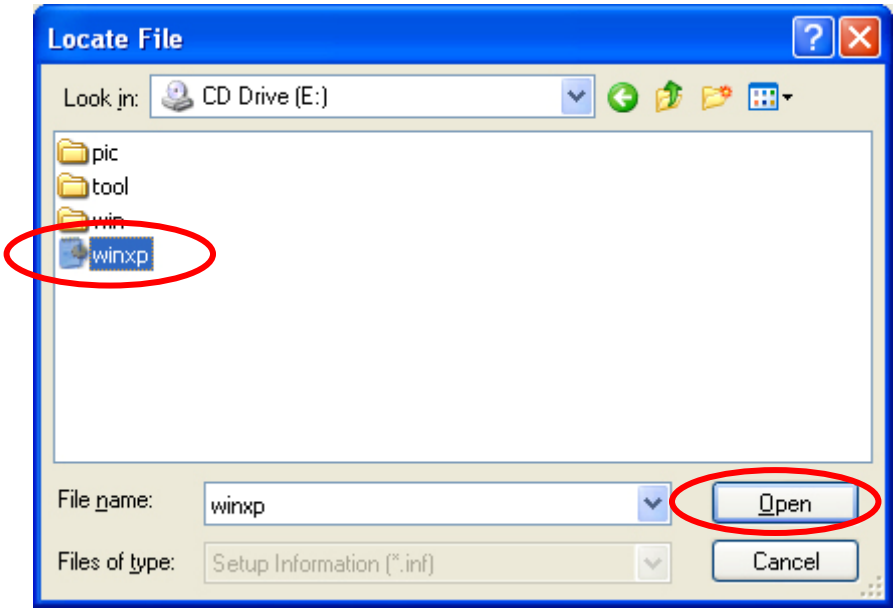


Figure 14

15. Click **Next** (**Figure 15**).

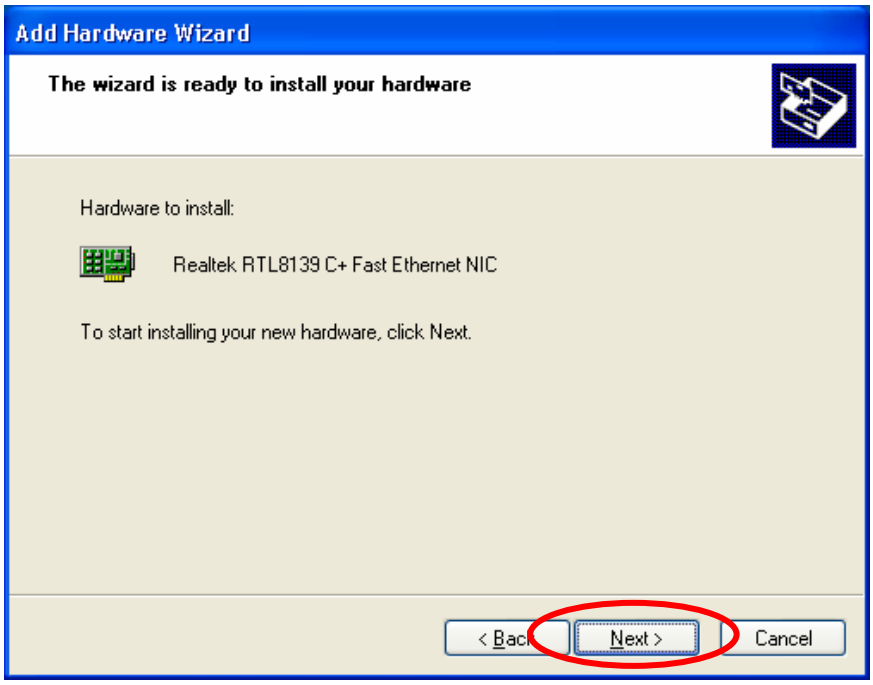


Figure 15

16. Click **Finish** (**Figure 16**).

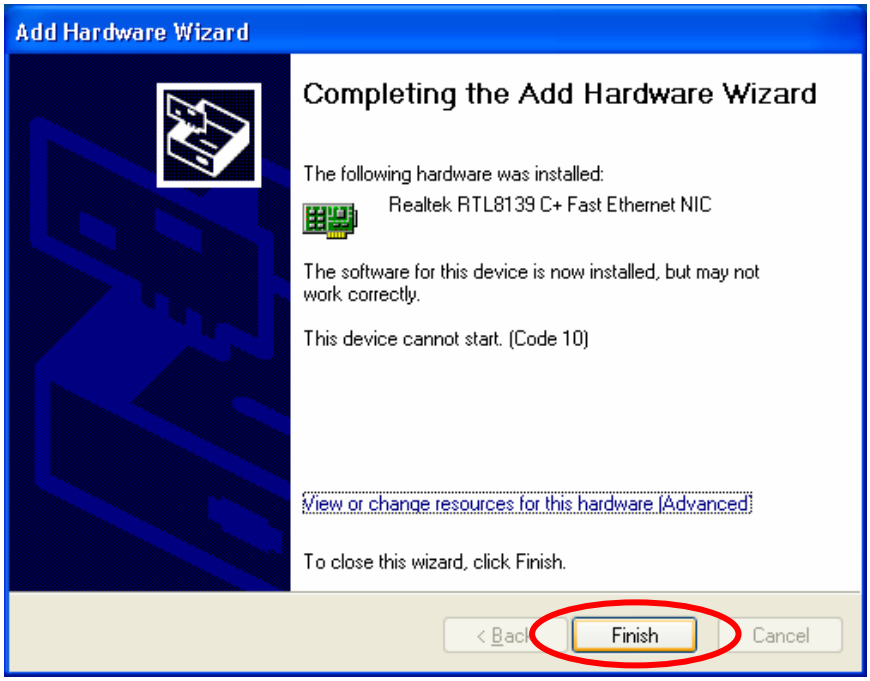


Figure 16

17. Click **Yes** to restart your computer and to complete your driver installation (**Figure 17**).

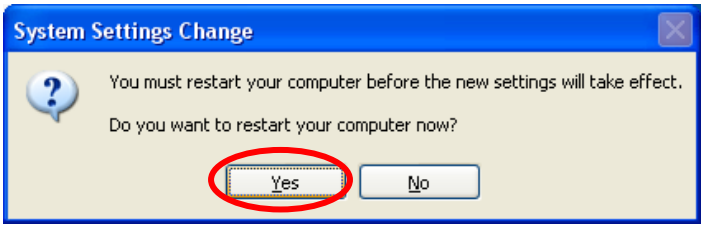


Figure 17

ASSESSMENT:

1. Why do we need to turn off the PC and unplug the power cable before we start installing the network card?

_____

_____

_____

_____

2. Mark T if True and F if False

_____ - a. NIC driver is only available in CD

_____ - b. A back panel plate that corresponds to the expansion slot has to be removed before inserting the NIC in your PC.

_____ - c. The common protocol used in Network that supports Internet is TCP/IP

_____ - d. The NIC driver should be preinstalled before inserting NIC in your PC.

2. Explain briefly the steps to install the NIC driver in your PC.

_____

_____

_____

_____

CABLE CRIMPING AND TESTING – STRAIGHT CABLE

LEARNING OUTCOME: 3.4.2.1 Crimp and test Untwisted Pair (UTP) cable using straight cable technique

3.4.2.2 Exercise care and caution when crimping a cable

DURATION: 2 periods

REQUIREMENTS:
CAT5E cable (3 meters)
RJ45 connectors (2 units)
Crimp tool
Cable stripper
Wire cutter
LAN cable tester

NOTE :

A cable is needed to connect a computer to a wired local area network (LAN). There are two types of cables. The first is the “straight cable” which is used to connect computers through a hub. The second type is the “crossed cable” for a direct connection between two computers without using a hub. Connecting these cables is called cable crimping. This module shows how to crimp a straight cable using Untwisted Pair cable and RJ45 connectors.

ACTIVITIES:

1. Skin off the cable jacket approximately 3cm by using a cable stripper. 2. Untwist each pair, and straighten each wire between fingers. 3. Place the wires in the order of **568B** schematic (refer Table 1 in page 2). Bring all the wires together, until they touch. 4. At this point, recheck the wiring sequence with the diagram. 5. Optional: Mark a distance of 1.5cm from the end of the cable jacket on the wires.	
6. Hold the set (and sorted) wires together tightly, between the thumb, and the pointer finger. 7. Cut all of the wires at a perfect 90° angle from the cable at 1.5cm from the end of the cable jacket by using a wire cutter. This is a very critical step. If the wires are not cut straight, they may not make contact with the connector pins.	
8. Conductors should be at a straight 90° angle, and be 1.5cm long, prior to insertion into the connector.	
9. Insert the wires into the RJ45 connector with the pins facing up.	

10. Push moderately hard to assure that all wires have reached the end of the connector. Be sure that the cable jacket goes into the back of the connector by about 0.3cm.	
11. Place the connector into a crimp tool, and squeeze hard so that the handle reaches its full swing. 12. Repeat step 1 to 11 for the other end of the cable.	
13. Use a cable tester to test for proper continuity.	

Assessment:

1. Table below is 568B wiring schematic for a Local Area Network.

Pair	Wire	Pin
White/Blue	White/Blue	***W***
	Blue	4
White/Orange	White/Orange	***X***
	Orange	***Y***
White/Green	White/Green	3
	Green	6
White/Brown	White/Brown	***Z***
	Brown	8

Identify the pin numbers of W, X, Y and Z.

	W	**X**	**Y**	**Z**
A	1	5	2	7
B	5	1	2	7
C	2	7	1	5
D	5	1	7	2

CABLE CRIMPING AND TESTING – CROSSED CABLE

LEARNING OUTCOME: 3.4.2.1 Crimp and test Untwisted Pair (UTP) cable using crossed cable technique

3.4.2.2 Exercise care and caution when crimping a cable

DURATION: 2 periods

REQUIREMENTS:
CAT5E cable (3 meters)
RJ45 connectors (2 units)
Crimp tool
Cable stripper
Wire cutter
LAN cable tester

NOTE :

In module earlier, we learn how to crimp a straight cable. This module shows how to crimp a **crossed** cable using UTP cable and RJ45 connectors. Differences between these two wir
ng schematics are

- For a straight through cable, both ends use the same wiring schematics.
- For a crossover cable, both ends use **different** wiring schematics

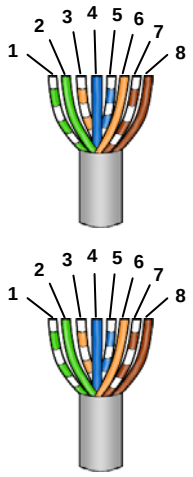
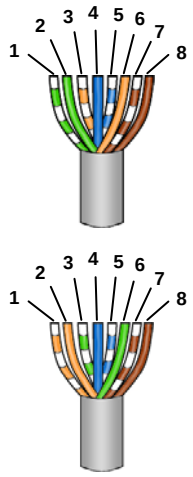
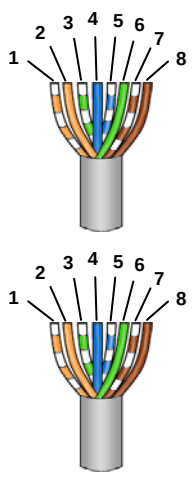
ACTIVITIES:

1. Skin off the cable jacket approximately 3cm by using a cable stripper. 2. Untwist each pair, and straighten each wire between fingers. 3. Place the wires in the order of **568A** schematic (refer Table 2 in page 2). Bring all the wires together, until they touch. 4. At this point, recheck the wiring sequence with the diagram. 5. Optional: Mark a distance of 1.5cm from the end of the cable jacket on the wires.	
6. Hold the set (and sorted) wires together tightly, between the thumb, and the pointer finger. 7. Cut all of the wires at a perfect 90° angle from the cable at 1.5cm from the end of the cable jacket by using a wire cutter. This is a very critical step. If the wires are not cut straight, they may not make contact with the connector pins.	
8. Conductors should be at a straight 90° angle, and be 1.5cm long, prior to insertion into the connector.	
9. Insert the wires into the RJ45 connector with the pins facing up.	

10. Push moderately hard to assure that all wires have reached the end of the connector. Be sure that the cable jacket goes into the back of the connector by about 0.3cm.	
11. Place the connector into a crimp tool, and squeeze hard so that the handle reaches its full swing. 12. Repeat step 1 to 11 for the other end of the cable by placing wires in the order of **568B** schematic.	
13. Use a cable tester to test for proper continuity.	

ASSESSMENT:

1. Choose the correct pair of cabling that is used for direct connection from PC to PC.

		
A	B	C

2. What type of cable is used to connect two computers?

_____

_____

3. What is the requirement needed to crimp a crossed cable?

_____

_____

_____

_____

3.4.3 CONFIGURATION AND TESTING OF NETWORK

LEARNING OUTCOME: 3.4.3.1 Configure the workstation to join a Local Area Network

- Internet Protocol (IP) Address
- Subnet Mask
- Server name

3.4.3.2 Test the network connection.

DURATION: 4 periods

REQUIREMENTS: -

ACTIVITIES:

1. Click **Start**, then go to **Settings**. Click **Control Panel** (**Figure 1**).

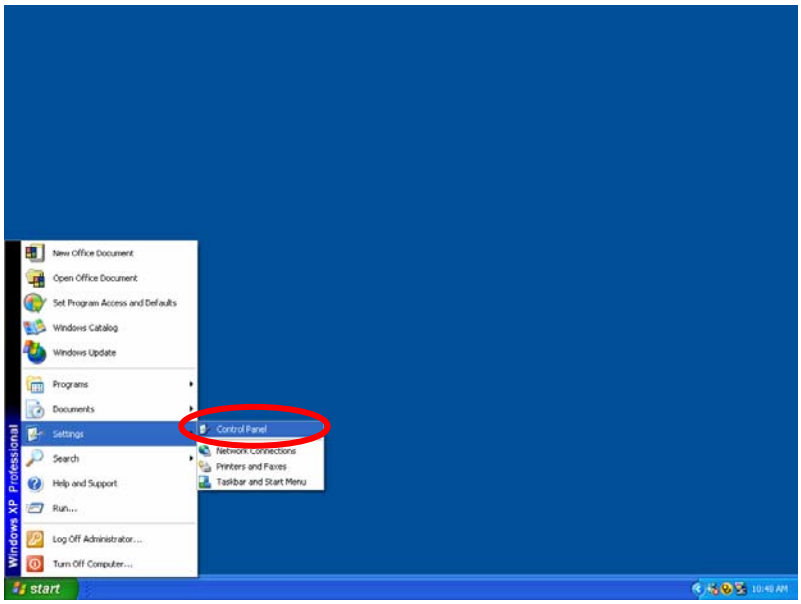


Figure 1

2. Click **Network and Internet Connections** (**Figure 2**).

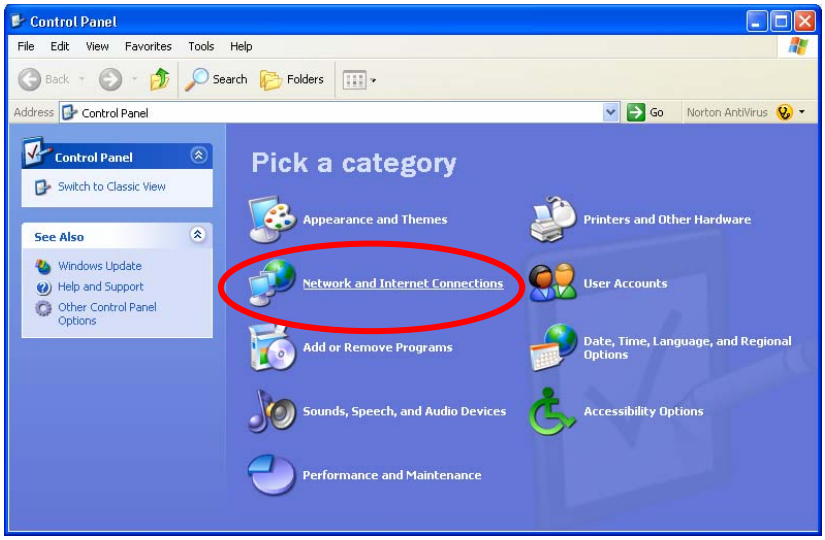


Figure 2

3. Click **Network Connections** (**Figure 3**).

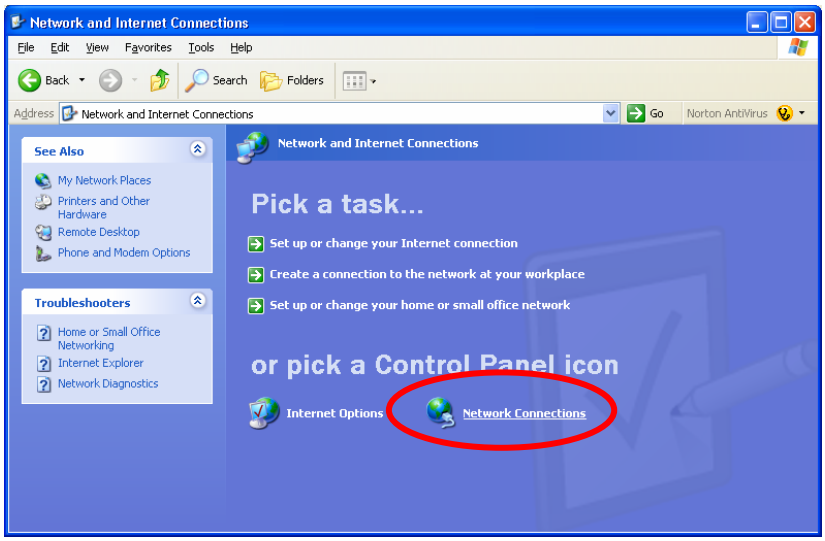


Figure 3

4. Highlight **Local Area Connection** icon. Go to **File** menu. Click **Properties**. (**Figure 4**).

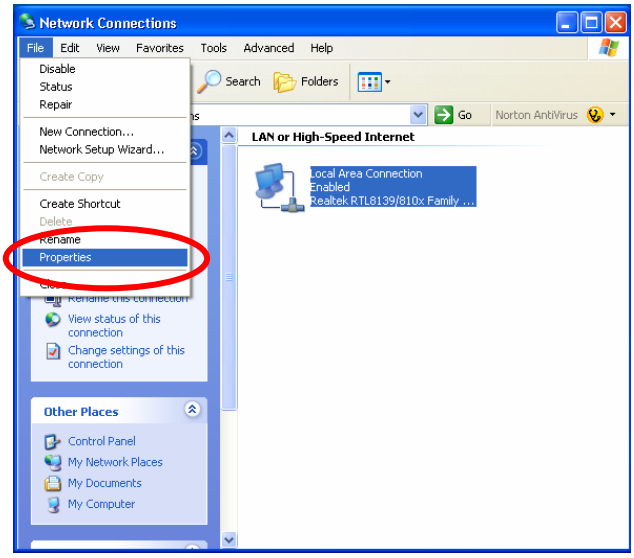


Figure 4

5. Highlight **Internet Protocol(TCP/IP)** and click **Properties** (**Figure 5**).

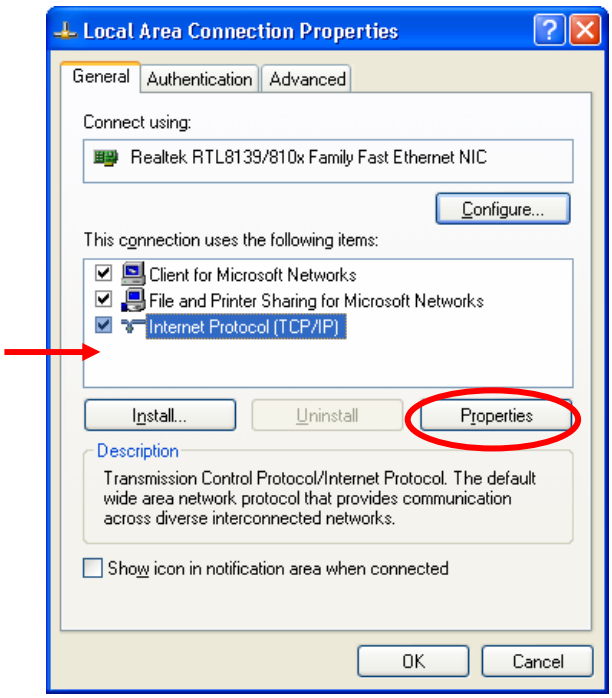


Figure 5

6. **Internet Protocol (TCP/IP) Properties** window appears (**Figure 6**).

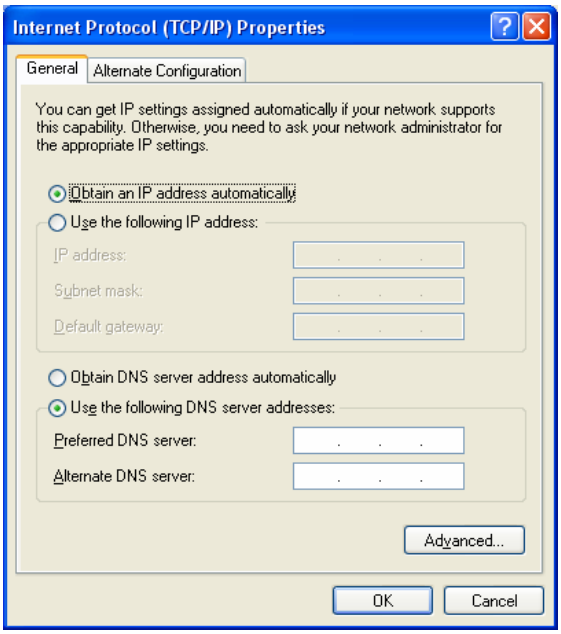


Figure 6

7. Check '**Use the following IP address**'. Fill in the network information for:
   i. IP address
   ii. Subnet Mask
   iii. Default Gateway (only if available)
   iv. Preferred DNS server (only if available)

   Use the network information given by your teacher. **Figure 7** is an example of IP address. Click **OK.**

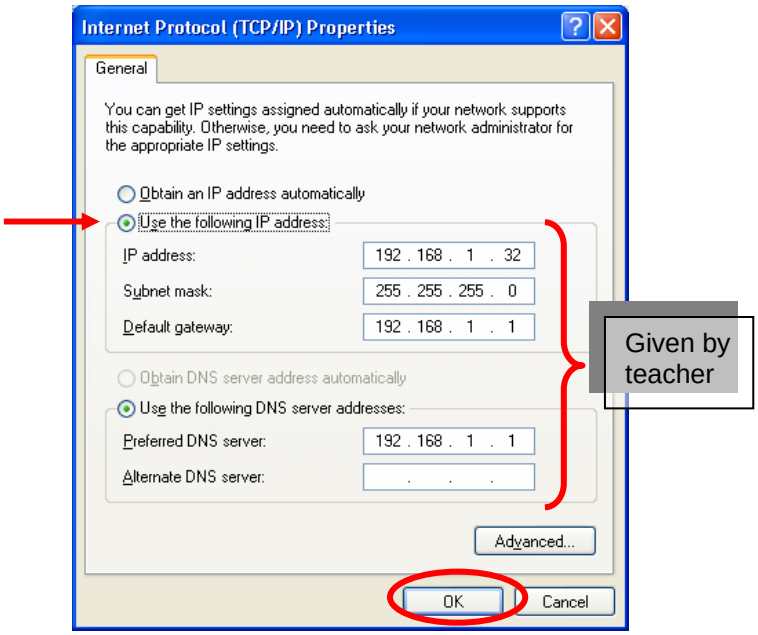


Figure 7

8. Close all windows. You must restart your computer before the settings take effect.

ASSESSMENT:

1. IP is an acronym for
   _____
   _____

2. If your IP is 192.168.1.28, then the default setting for the subnet mask is _____. 255. _____. _____

3. If your network is not working, list out the possibilities of the problem
   _____
   _____
   _____
   _____

3.4.4 Communicating and Data Sharing

LEARNING OUTCOME: 3.4.4.1 Create a shared folder

DURATION: 2 periods

REQUIREMENTS: -

ACTIVITIES:

A) SETTING PROPERTIES FOR DATA SHARING

1. Click **Start**, then go to **Settings**. Click **Control Panel** (**Figure 1**).

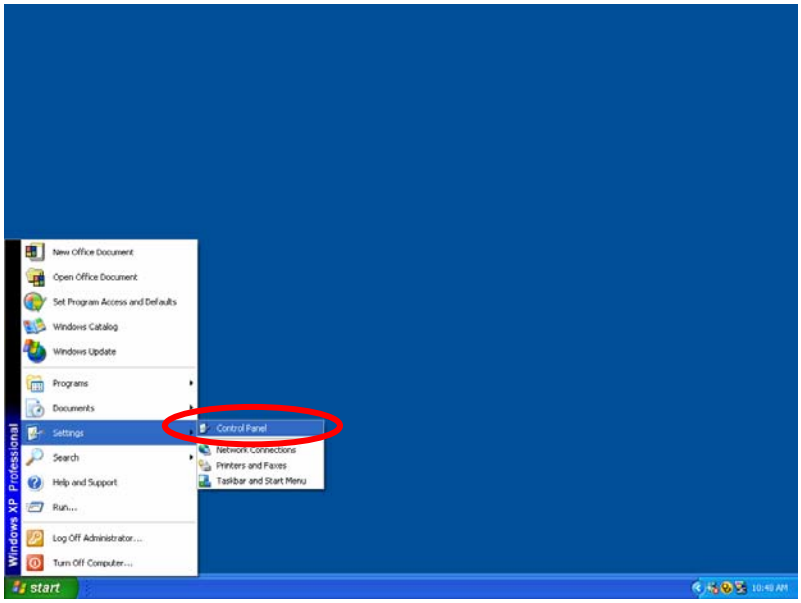


Figure 1

2. Click **Network and Internet Connections** (**Figure 2**).

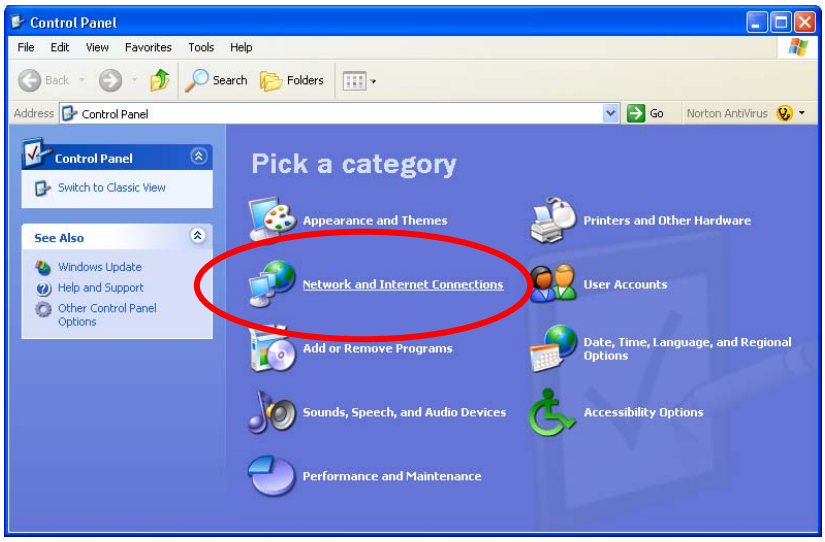


Figure 2

3. Click **Network Connections** (**Figure 3**).

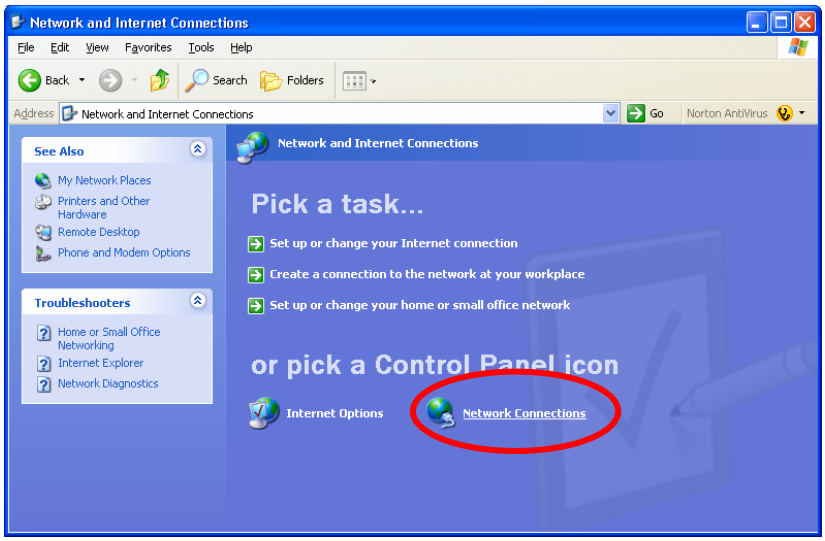


Figure 3

4. Highlight **Local Area Connection** icon. Go to **File** menu. Click **Properties**. (**Figure 4**).

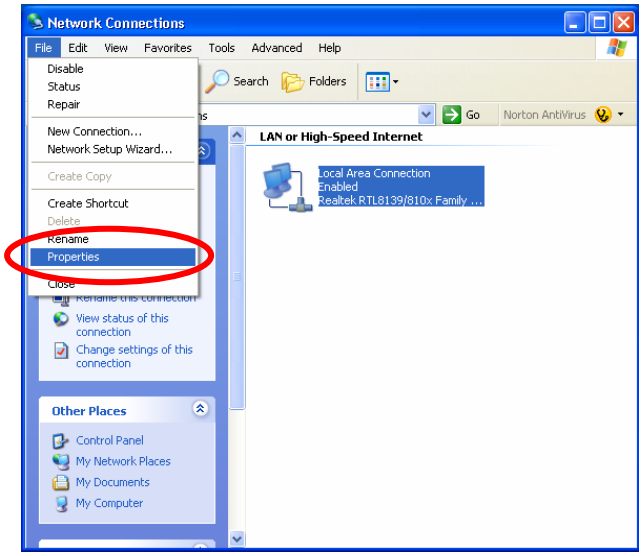


Figure 4

5. Check **Client for Microsoft Networks** and **File and Printer Sharing for Microsoft Networks**. These items are checked by default (**Figure 5**). Click **Close**.

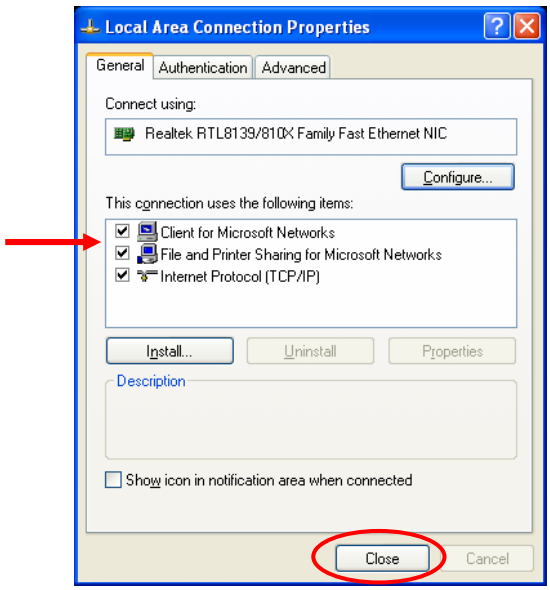


Figure 5

6. Click **Start**, then go to **All Programs** followed by **Accessories**. Click **Windows Explorer** (**Figure 6**).

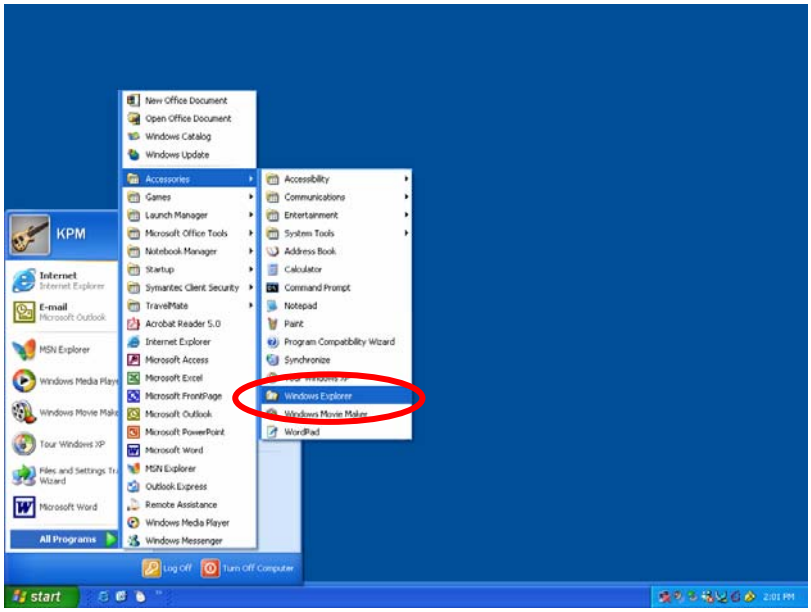


Figure 6

7. **My Documents** window appears. Highlight **My Pictures** folder. Go to **File** menu. Click **Sharing and Security** (**Figure 7**).

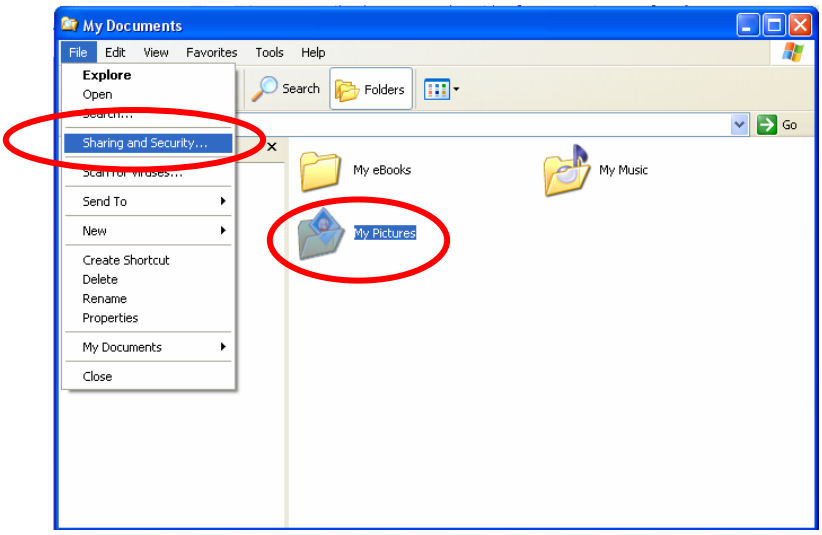


Figure 7

8. Click **Network Setup Wizard** (**Figure 8**).

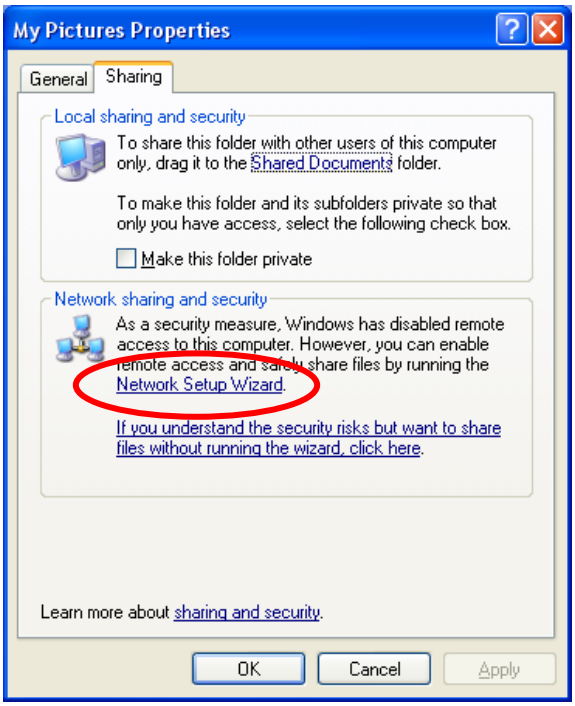


Figure 8

9. Click **Next** (**Figure 9**).

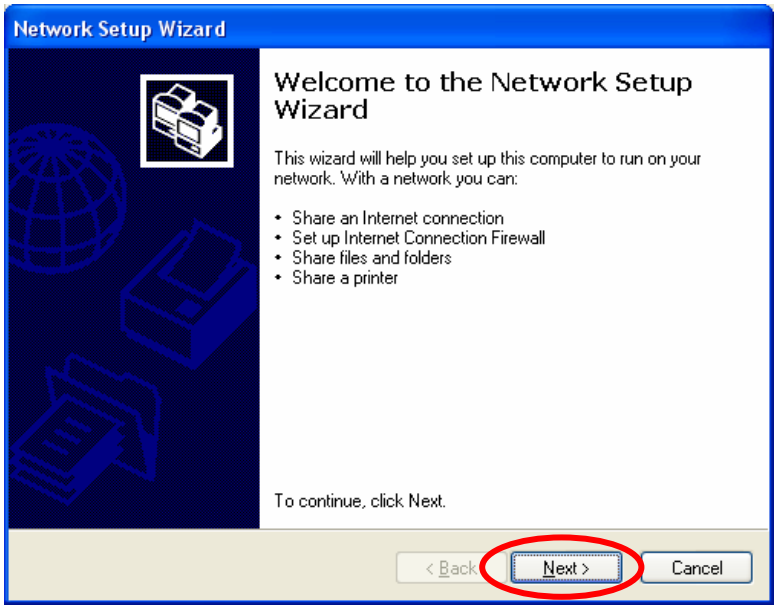


Figure 9

10. Click **Next** (**Figure 10**).

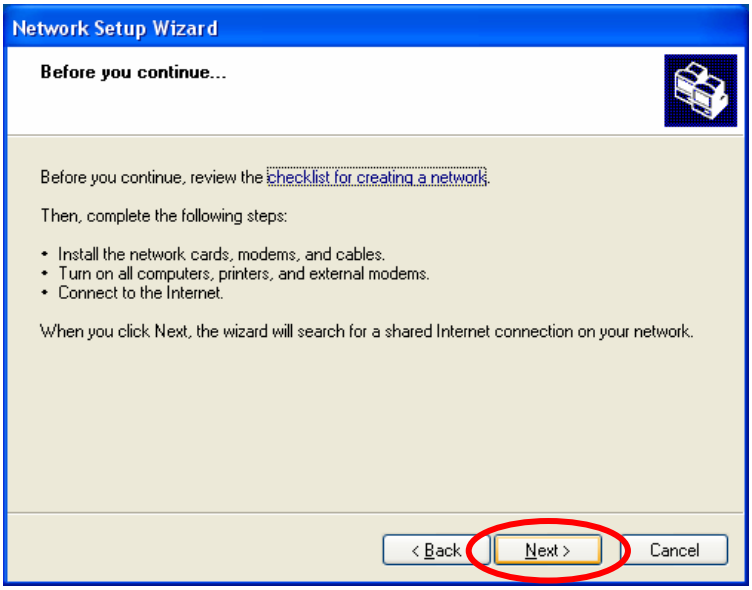


Figure 10

11. If the PC is not connected to a network, windows shown in **Figure 11** will pop-up. Check **Ignore disconnected network hardware** and click **Next**.

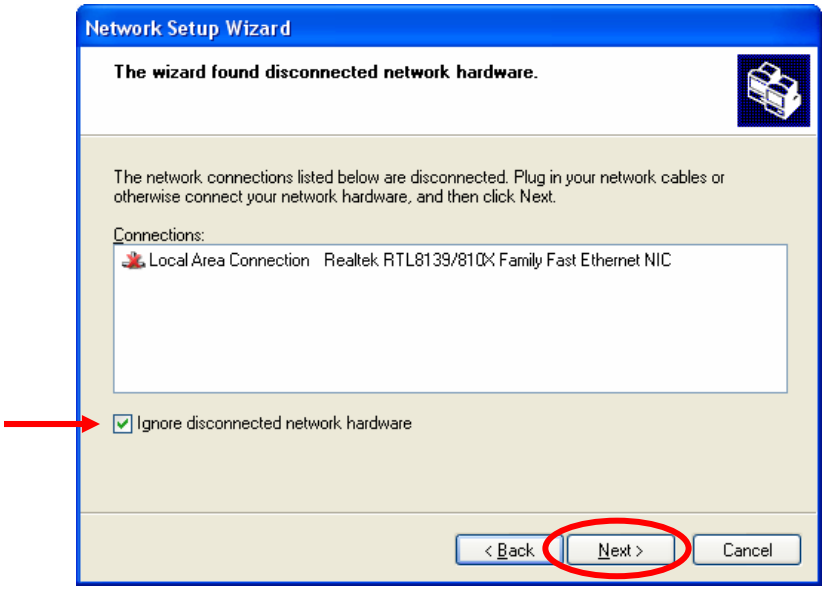


Figure 11

12. Check '**This computer connects to the Internet through another computer on my network or through a residential gateway**' and click **Next** (**Figure 12**).

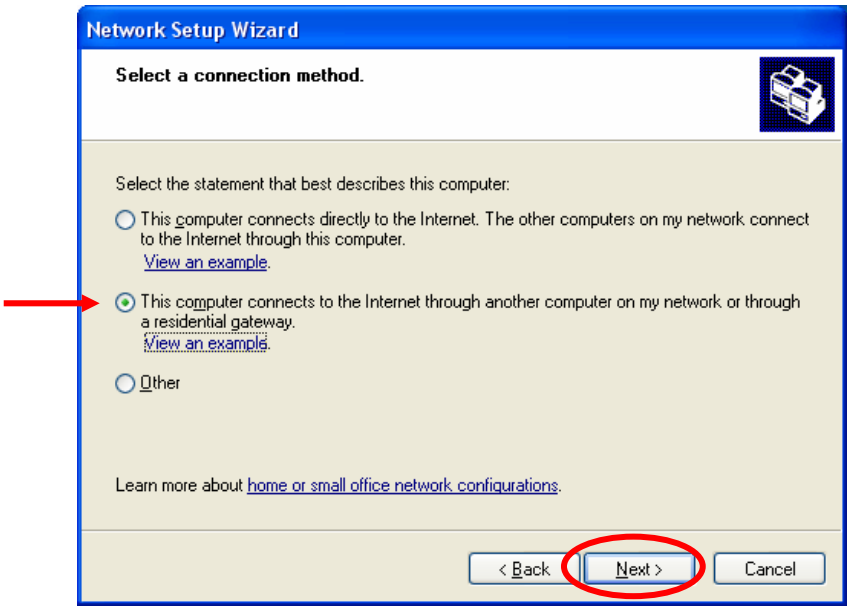


Figure 12

13. Check '**Determine the appropriate connections for me (Recommended)**' and click **Next** (**Figure 13**).

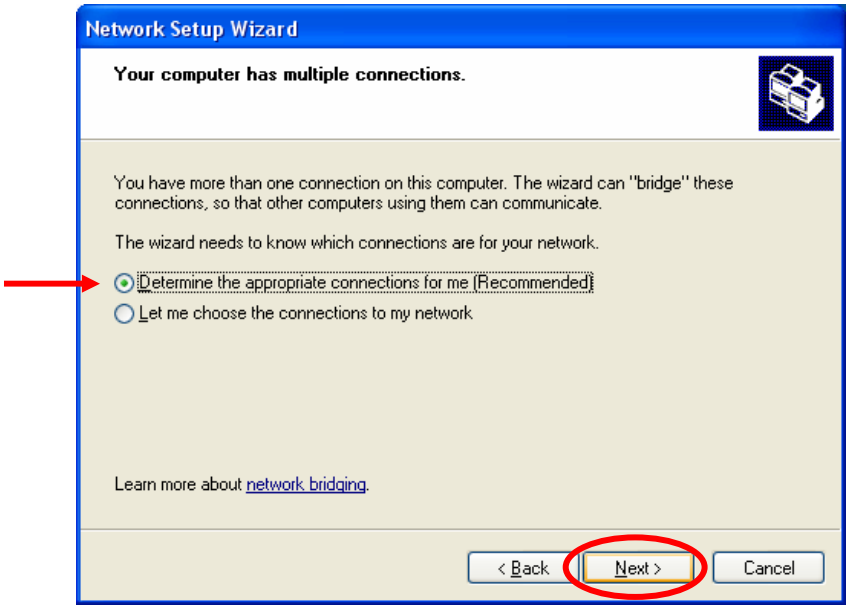


Figure 13

14. Fill in:

    i. Computer description
    ii. Computer Name

    Use the information given by your teacher. **Figure 14** is an example windows and click **Next**..

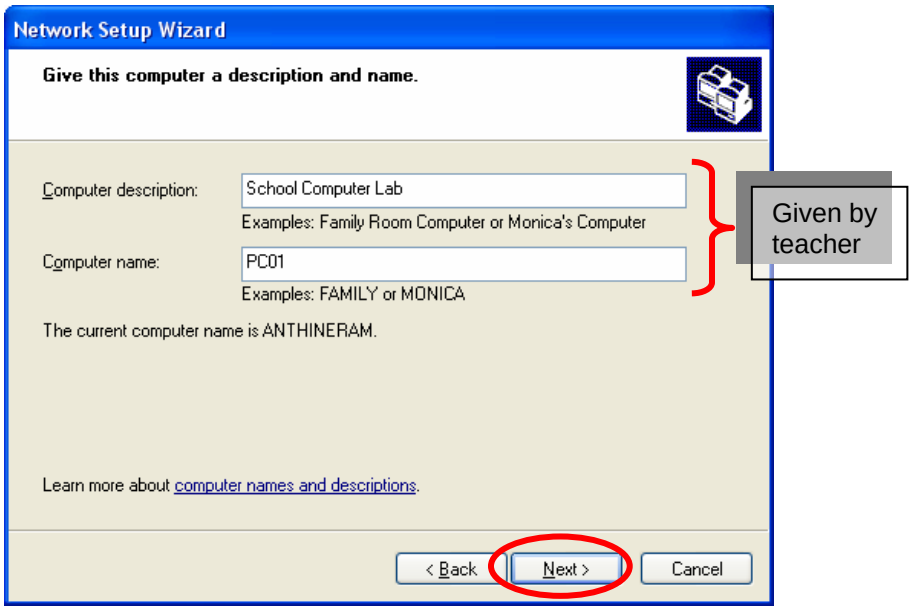


Figure 14

15. Click **Next** (Figure 15).

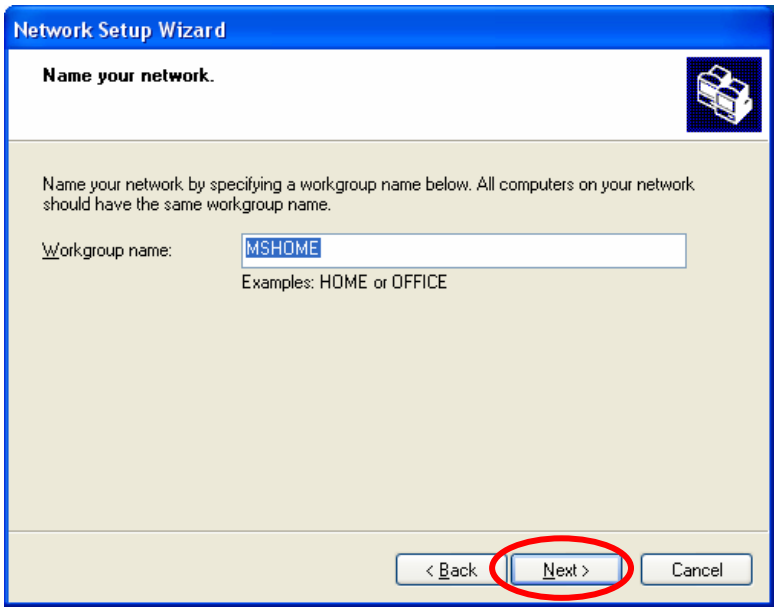


Figure 15

16. Click **Next** (Figure 16).

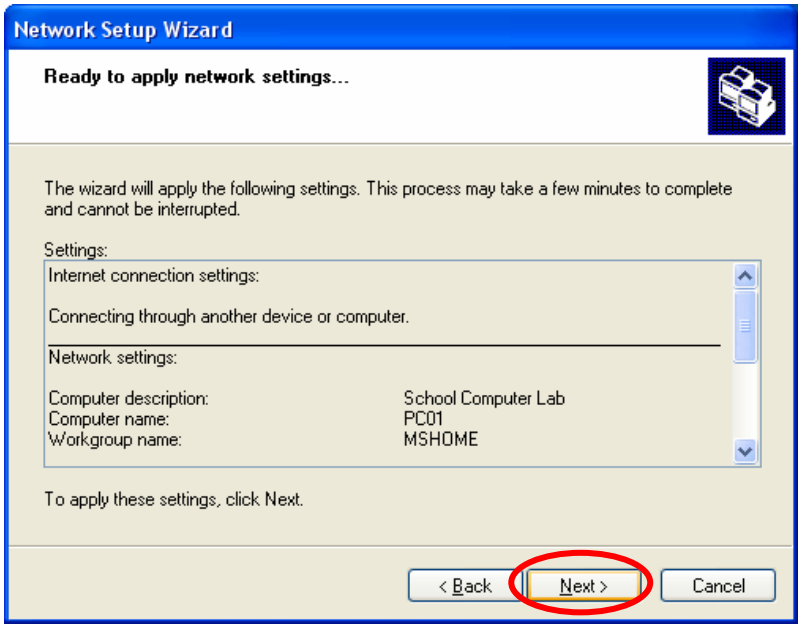


Figure 16

17. A window configures your computer for networking will appear (**Figure 17**).

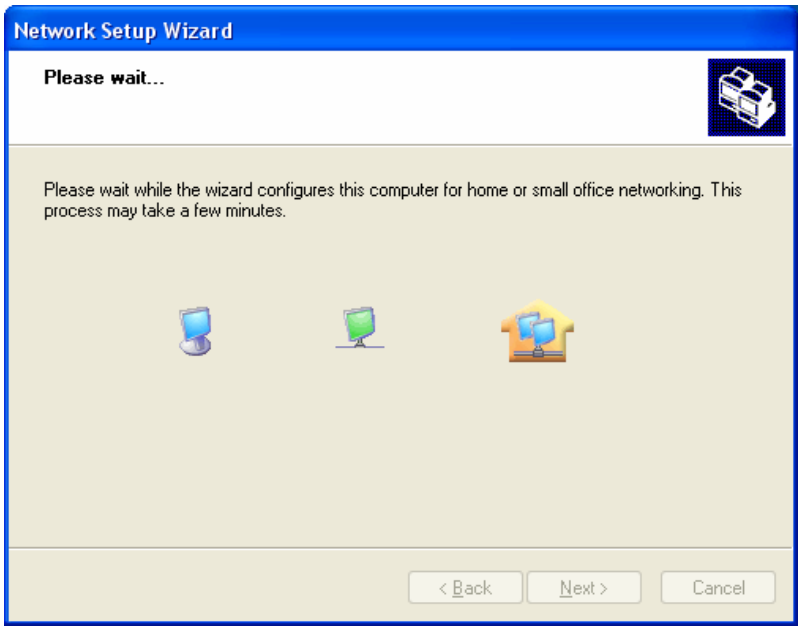


Figure 17

18. Check **Just finish the wizard; I don't need to run the wizard on other computers** and click **Next** (**Figure 18**).

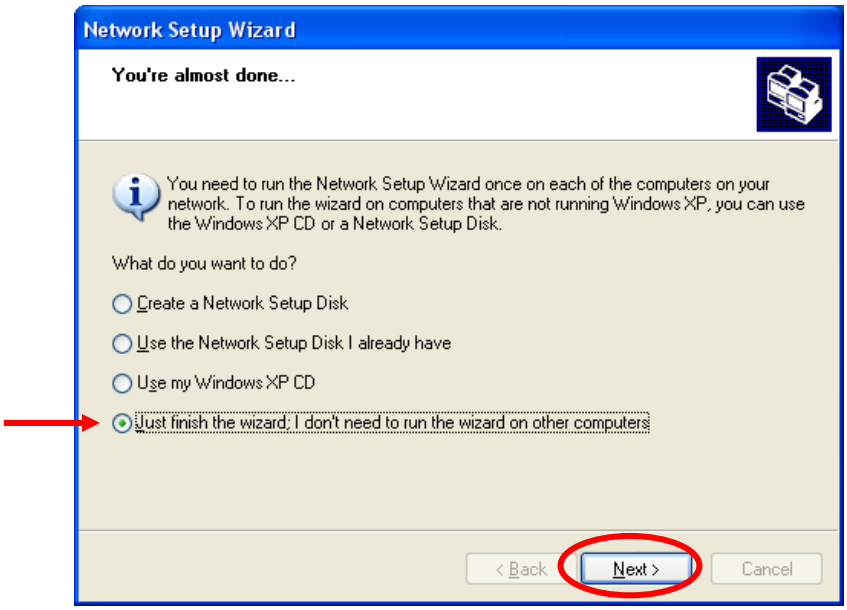


Figure 18

19. Click **Finish** (**Figure 19**).

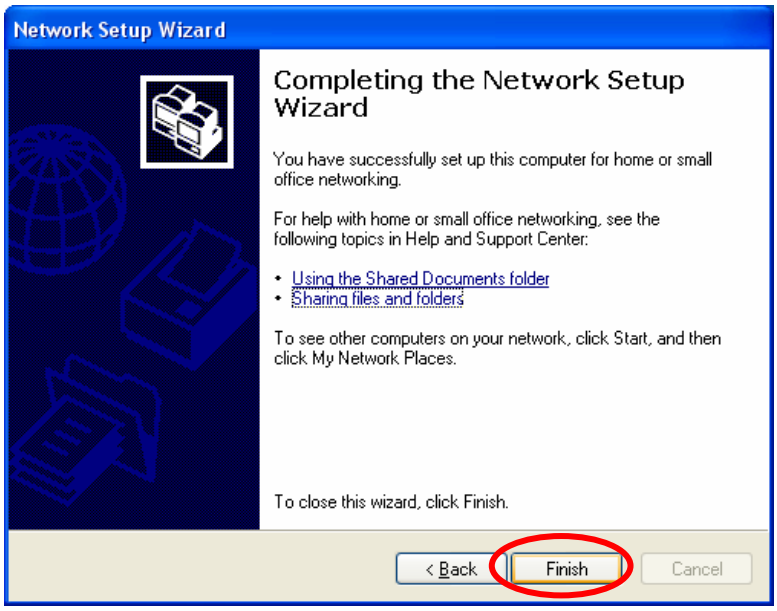


Figure 19

20. Click **Yes** to restart your computer (**Figure 20**).

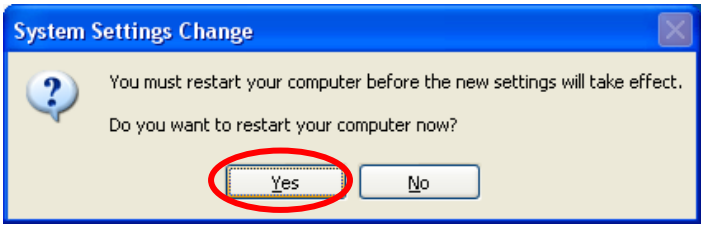


Figure 20

B) CREATING SHARED DRIVE

1. Click Click **Start**, then go to **All Programs** followed by **Accessories**. Click **Windows Explorer** (**Figure 1**).

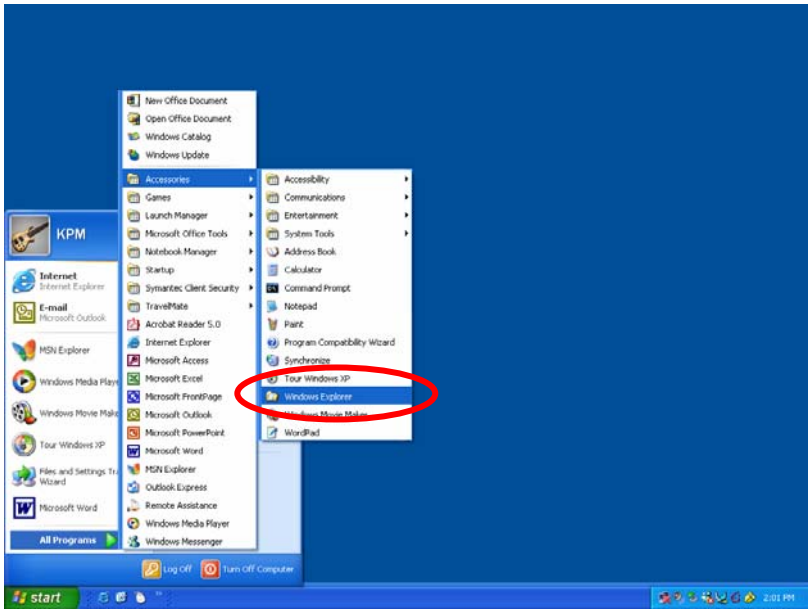


Figure 1

2. **My Documents** window appears (**Figure 2**).

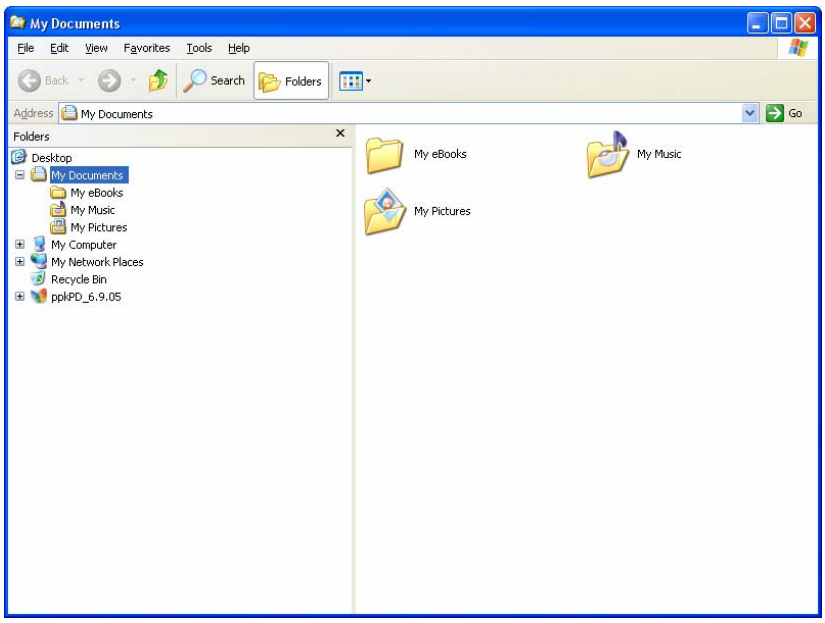


Figure 2

3. Click **My Computer** (**Figure 3**).

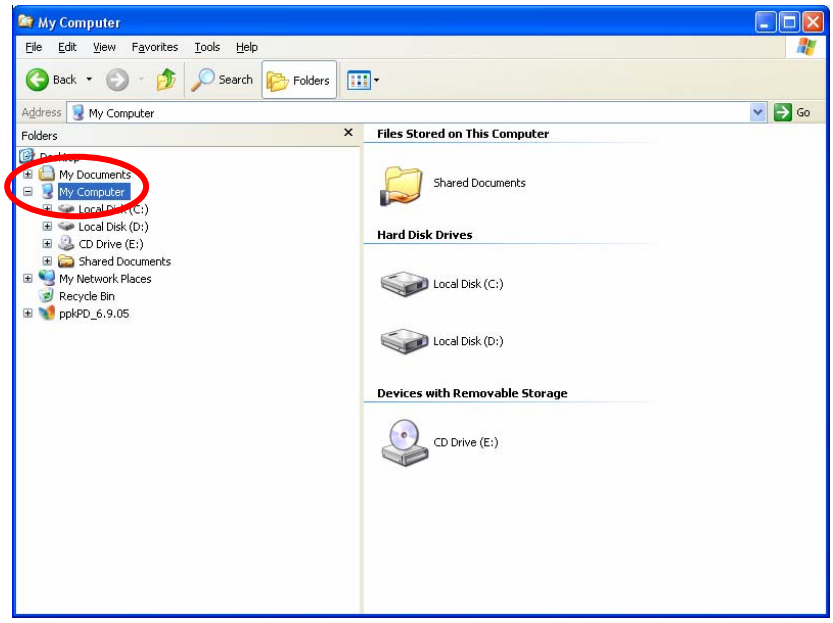


Figure 3

4. Highlight **Local Disk (C:)** icon. Go to **File** menu. Click **Sharing and Security** (**Figure 4**).

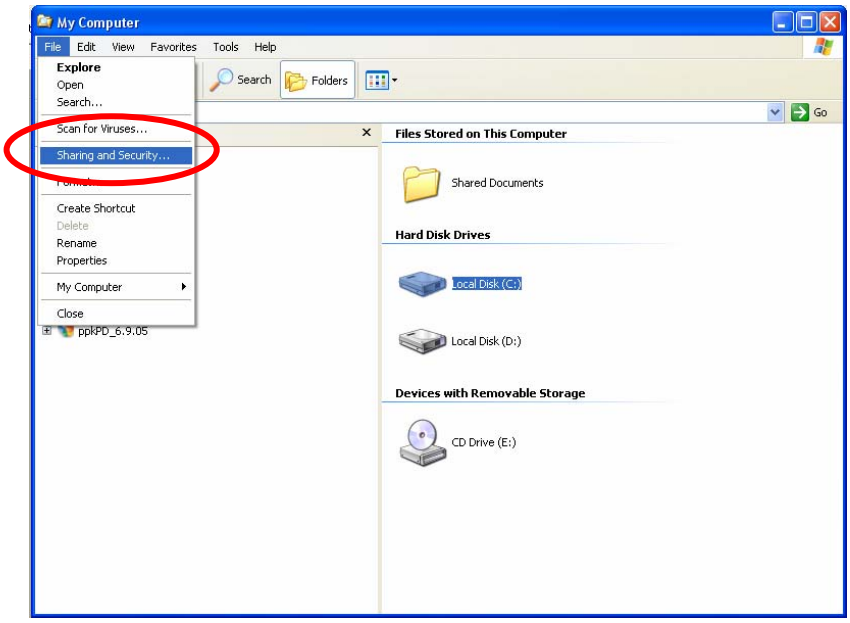


Figure 4

5. Click **If you understand the risk but still want to share the root of the drive, click here** (**Figure 5**).

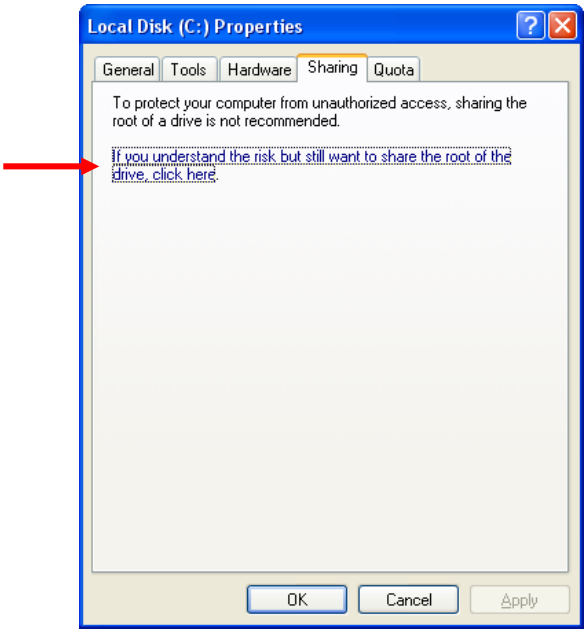


Figure 5

6. Check **Share this folder on the network** and click **Apply** (**Figure 6**).

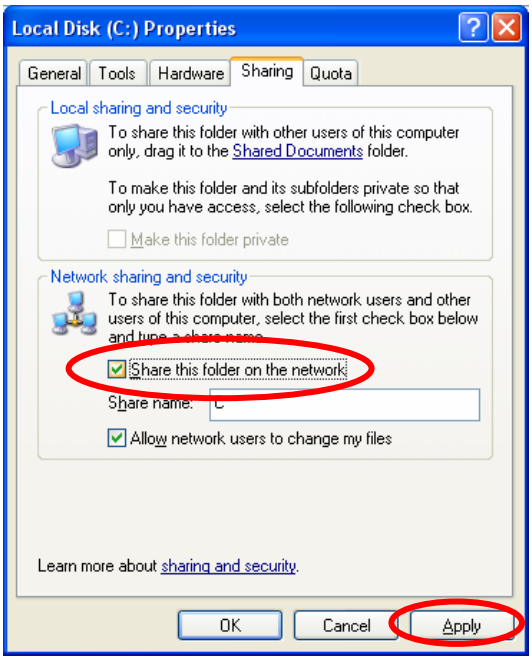


Figure 6

7. **Figure 7** show an example of a shared drive.

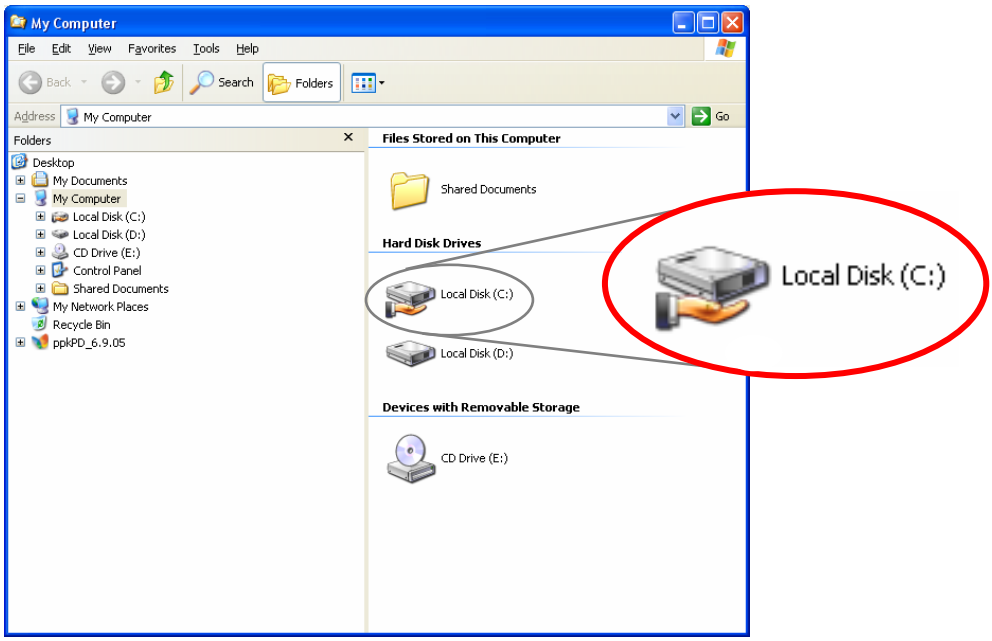


Figure 7

C) ACCESSING SHARED DRIVE

1. Click **Start**, then go to **All Programs** followed by **Accessories**. Click **Windows Explorer** (**Figure 1**).

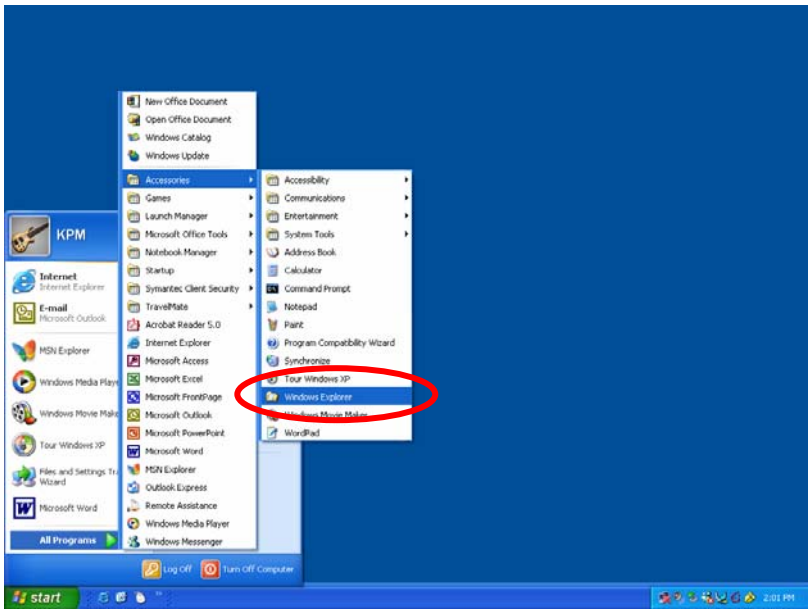


Figure 1

2. Click **My Network Places** then **Entire Network** followed by **Microsoft Windows Network** and finally **Mshome** (**Figure 2**). All the computers connected to the network are shown on the right side of the window.

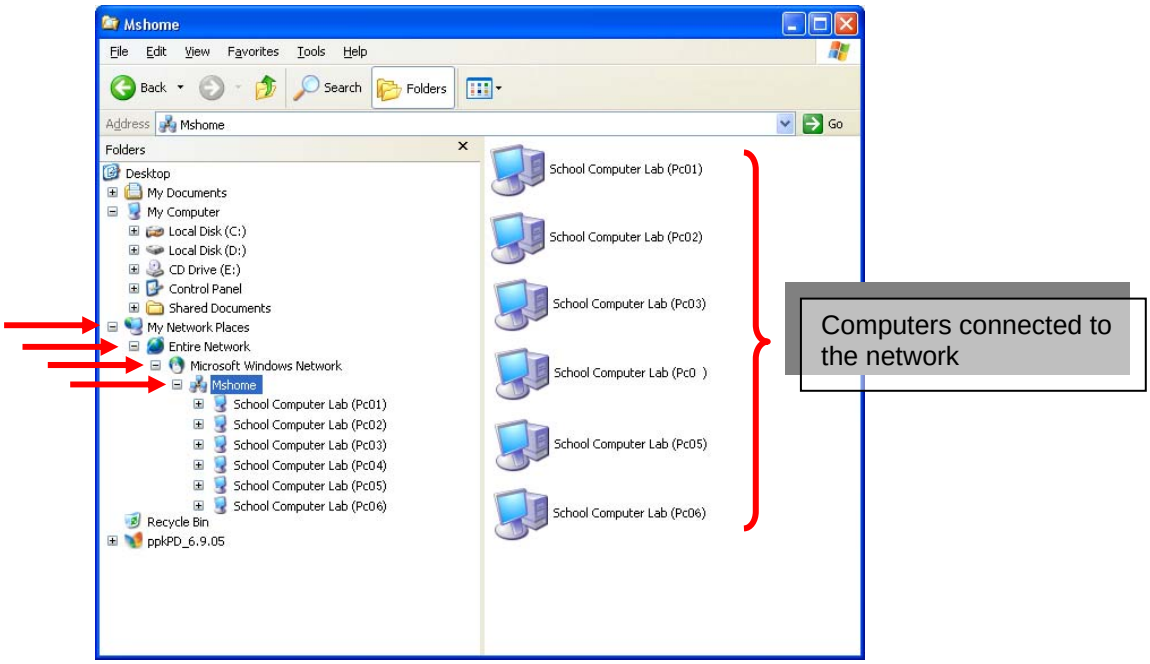


Figure 2

3. Click any computers listed. **Figure 3** shows **School Computer Lab (Pc01)** selected. Now you can access drive **C:** of **Pc01**.

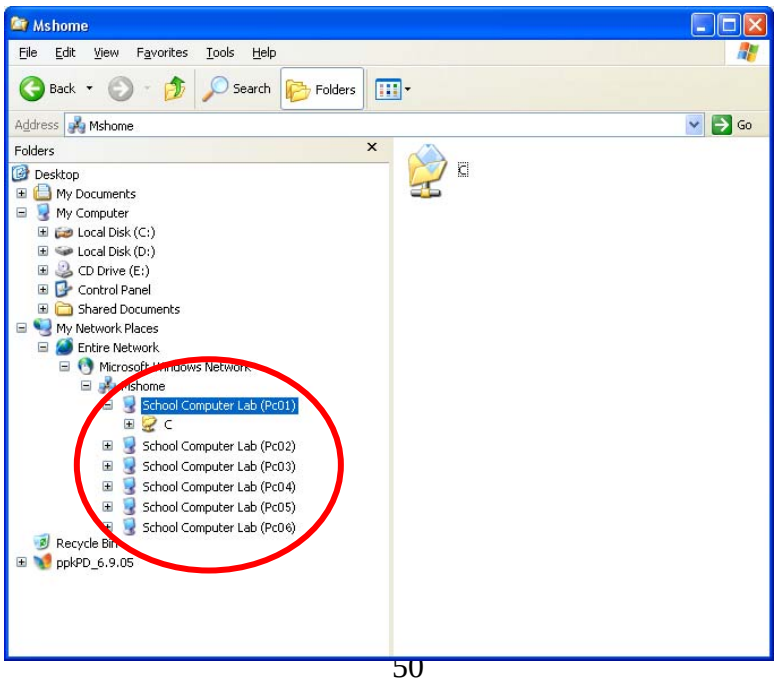


Figure 3

ASSESSMENT:

1. Read the statement below, tick (✓) if **TRUE** and cross (x) if **FALSE**.

No	Statement	(✓) or (x)
1.	The user cannot set password protection on their shared files or folders	
2.	We can enable file sharing and disable printer sharing at one time	
3.	We can allow or deny a user access to our shared files whenever we want.	
4.	To change access permissions you must be the owner, or have been granted permission to do so by the owner.	

CONGRATULATIONS !!

YOU HAVE SUCCESSFULLY COMPLETED THIS MODULE. YOU ARE NOW ABLE TO SET NETWORK FACILITIES AND COMMUNICATE AND SHARE DATA THROUGH THE NETWORK.