Hardware needed to connect to a LAN

Teacher's Notes

Lesson Plan

Length	60 mins	Specification Link	214/b	
Learning objective		Candidates should be able to: (b) describe the hardware needed to connect stand-alone computers into a local area network, including hub/switches, wireless access points		

Time (min)	Activity	Further Notes
10	Required props: Network interface card (NIC), Ethernet cable and a switch or hub. Show the devices to the students, briefly explain their roles and demonstrate how the cable connects to the NIC and switch.	
10	Watch the video, pausing to discuss the content.	
5	Discuss the video to assess learning. Ask questions such as: • Why is a network adapter/network interface card required? • What is the difference between a hub and a switch? • What is a wireless access point (WAP)?	Answers: It formats the data sent from the computer into a required format according to the protocols (rules) of the network. Both allow the computers to communicate but a hub transmits the data to all of the computers on the network whereas a switch sends the data to only the expected recipients. It allows wireless devices to connect to a wired network using Wi-Fi.
15	**Worksheet 1** Students to complete Worksheet 1 either on paper or on computer. They may need access to the Internet to research some of the questions. Ask individual students for their answers and discuss with the class so that all students will have the correct answers.	Answers provided. Ask students with the correct responses to explain to the class how they arrived at their answers.
10	The students use **Interactive Activity 1**.	

Time (min)	Activity	Further Notes
	Extension Challenge/Homework Students to complete and submit **Worksheet 2** for homework.	
10	**Plenary – Test a friend Interactive activity** The students should work in pairs to test each other's knowledge using this interactive activity.	

WORKSHEET 1 ANSWERS

1 Describe the following devices and their roles in allowing a computer to connect to a network and communicate with other computers.

(a) a network interface card (NIC) or network adapter

A network interface card or network adaptor is a component that connects a computer to a network.

It formats the data sent from the computer into a required format according to the protocols (rules) of the network.

Originally the adapters for desktop PCs were on 'cards' that were installed in the computer, but they are now built into the motherboard.

Adapters that connected to USB ports were more commonly used in laptop computers.

Network interface cards and adapters now support both wired and Wi-Fi network connections.

(b) a wireless access point (WAP)

A wireless access point allows wireless devices to connect to a wired network using Wi-Fi.

It converts data it receives through cables into a wireless signal and vice versa.

WAPs are commonly used in public buildings to provide 'Internet Hotspots'.

It is functionally similar to a router in a home network.

(c) a network hub

A hub is like a junction box. All of the computers on the network plug into a port on the hub using a cable.

When a message is received through the cable from one of the computers, the hub transmits it to all of the other computers.

A hub cannot send and receive information at the same time.

In a large network this can be a problem as it leads to a lot of unnecessary network traffic.

(d) a network switch

Network switches have a similar function to hubs, but they read the messages to find the intended destination and send it to only the computers that are supposed to receive it.

They can do this because they build up a table of the addresses of all of the devices, e.g. network interface cards, on the network.

Switches can send and receive information at the same time, so they can send information faster than hubs can.

They therefore cut down on unnecessary network traffic.

WORKSHEET 2 ANSWERS

1 **The manager of a small business has decided to network all the computers.**

The computers are to be connected by cable, but she has noticed that in some of the older ones there is no port for the cable connection.

(a) (i) What will she have to install in these older computers so that they can access the network? (1)

Network interface cards (NICs).

(ii) Explain why these devices are needed for a computer to connect to the network. (2)

They format the data sent from the computer (1) into a required format according to the protocols (rules) of the network (1).

(b) The manager is unsure about whether to use a hub or a switch for the network.

Describe the difference between these two devices and how this will affect the functioning of the network. (2)

A hub transmits data to all of the computers on the network whereas a switch sends the data only to the required computer (1).

Using a hub will result in unnecessary network traffic, which will be avoided by using a switch (1).

(c) What device will be needed to allow wireless devices to connect to the network? (1)

A wireless access point (WAP).