# Unit 1.4 Wired and Wireless Networks – Lesson 1

## Activity 1 – Local area network (LAN) vs Wide area network (WAN) (Answers)

### Higher ability

Research the key areas below about each type of network. Complete the boxes for each network.

| **Key point to research** | **LAN** | **WAN** |
| --- | --- | --- |
| Area it covers | Small geographical area that covers a single building or a single site | Large geographical area e.g. several sites, town, county, country, continent |
| Connection | Wireless  Ethernet Cable (Wired)  Fibreoptic  Use of Network Interface Cards  Use of Wireless Adapter  Connected via a Router / Switch | Phone lines  Internet connection  Fibre Optic  Satellite  Public network systems  Leased lines  Dedicated lines |
| Speed | Very High Speed (up to 1000mbps) | Slower speed (aprox 150 mbps) |
| Cost | Cheaper to set up – need for additional hardware such as a router and cables (although could use wireless) | Using a dedicated line would be costly for a company.  Using a leased line would incur monthly subscription costs  WAN would require ongoing costs of using external infrastructure |
| Security | More control over security  Anti-virus  Firewalls  User names / Passwords  Account management | Less control over security especially hackers & DDOS attack. Would need to configure firewalls & up-to-date anti-virus |
| Example | A school network  A home network | A council network  Argos network |

**Extension:**

1. You have recently had an Internet connection put into your home and decide to set up a LAN so that you can connect your PC, tablet, mobile phone and game consoles to share The Internet and also photos/videos from these devices.
2. Why is a LAN the most appropriate choice?

|  |
| --- |
| Because it is a single site – over a small geographical area |

1. What hardware would you need to buy?

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| --- |
| Would need a connection device like a router, potentially Ethernet cables to link the PC and the consoles for the best speeds. Would also need a Network Interface Card for the PC (or a wireless adapter) |

1. How would each device connect to the network?

|  |
| --- |
| Either by Ethernet wired cable or through wireless (wifi) |

1. Discuss the factors that would affect the speed of the network

|  |
| --- |
| The type of Ethernet cable would affect the speed – Cat 5e / Cat6 cable would offer the fastest speeds. If devices are connecting wirelessly – walls and other interference from other radio waves could affect the speed of the network e.g. how far from the router is the device. |

1. If a company wanted to connect to a WAN – they may make use of a Dedicated Line or a Leased Line – discuss the difference between these two.

|  |
| --- |
| *Leased line* – a company would pay a monthly subscription cost to rent a line (which is external infrastructure) that would allow devices to connect over a large geographical area. The company that the line is being rented from would have the responsibility of maintenance.  *Dedicated line* would be one in which the company would pay to have an external cable dedicated to their data transmission. If there were any problems with the cable then they would be responsible for maintenance. This can be very costly but offers great transfer speeds. |

## Activity 1 – Local area network (LAN) vs Wide area network (WAN)

### Low ability

Research the key areas below about each type of network. Complete the boxes for each network.

| **Key point to research** | **LAN** | **WAN** |
| --- | --- | --- |
| How big is the area that this type of network covers?   * Geographically small? * Geographically large? |  |  |
| How are computers normally connected together in this type of network   * Wired (Ethernet) * Wirelessly * Dedicated Lines * Leased Line * The Internet * Satellite * Phone Lines |  |  |
| What is the average speed of data transmission on this type of network?   * Kbps? * Mbps? * Gbps? * Tbps? |  |  |
| What kind of costs are involved in setting up this type of network?   * Initial purchase of hardware? * On-going costs (subscriptions)? * Cable costs |  |  |
| How secure is this type of network?   * What security risks are there? * What could be done to help the security? |  |  |
| Can you give an example of this type of network? |  |  |

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