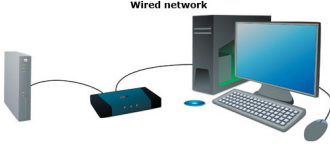
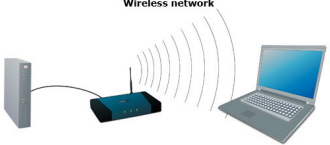


TOPIC: Wired and Wireless Networks

LEARNING OBJECTIVES:

- **Wired / Wireless networks**
- **Advantages & disadvantages of wired networks**
- **Advantages & disadvantages of wireless networks**

	Teacher Activity	Pupil Activity
Starter activity (5-10 mins) [individual/ paired or group]	<i>Discuss wired / wireless networks</i>	Discuss (individual/ paired or group) Where would you expect to see a wired network? Where would you expect to see a wireless network?

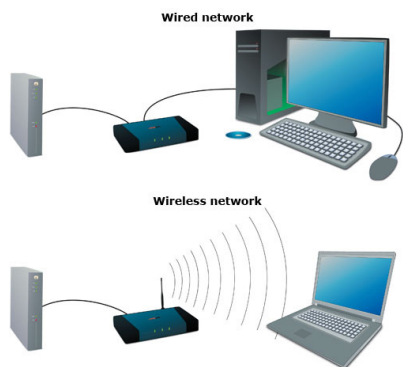
<p>Main activity one (15 mins)</p>	<p>Wired network: <i>It is a network that is physically connected using computers, Ethernet cables, routers and servers, used in many businesses and schools</i></p>   <p><i>(Could have a physical set up of a small network like picture above, or activity to get students to find the ports and connect devices together)</i></p> <p>Connection:</p> <p>Copper cables: <i>Copper cable uses electrical signals to pass data between networks. There are three types of copper cable: coaxial (degenerates over distance), unshielded twisted pair (twisted copper cables to reduce degeneration) and shielded twisted pair (uses copper shielding to make them less susceptible).</i></p> <p>Fibre optic cables: <i>Fibre optic cabling is made from glass that is very flexible, Light is passed through the cable using a transmitter. Light travels quickly through the light-reflecting internal wall of the cable.</i></p> <p><i>The transmitter in the router sends light pulses representing binary code.</i></p> <p>Advantages of a wired network:</p> <ol style="list-style-type: none"> 1. More control of the network 2. higher security 3. More reliable as signal strength is not a factor 4. Better speed 5. Cost effective <p>Disadvantages of a wired network:</p> <ol style="list-style-type: none"> 1. Not able to move around with computers 2. Costs to buy cables 3. Excessive wires are messy/ safety issue 4. Only so many computers can connect to one router 	<p>Class discussion (individual/paired or group)</p> <p>Note the features of a wired network</p> <p>Note the advantages of a wired network</p> <p>Note the disadvantages of a wired network</p> <p>Draw a diagram of a wired network</p>
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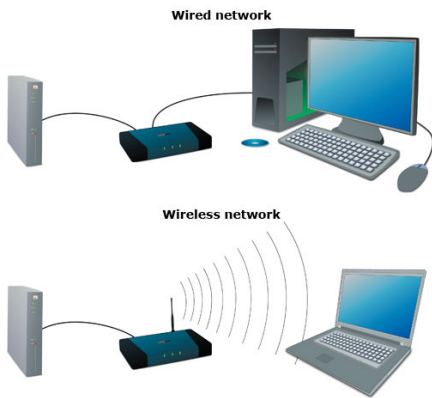


<p>Plenary one (5-10 mins)</p>	<p><i>Assess learning against the learning objectives</i></p> <p><i>This is an open activity whereby the teacher will decide on the best approach to do this based on the pedagogical approach your school takes on assessment.</i></p>	<p>For example:</p> <ul style="list-style-type: none">• 5 minute timed writing exercise on what has been learned so far• Fill in class notes• Have a discussion• Answer open questions• Answer directed questions
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<p>Main activity two (15 mins)</p>	<p>Wireless network: <i>It is a network that has no wire connections. Devices can connect via radio waves to a wireless router to provides access on to a network.</i></p> <p>Connection: <i>Used in cafes, hotels, some work places, any hotspots</i></p> <p>Advantages of a wireless network:</p> <ol style="list-style-type: none"> <i>1. Cheap set up cost</i> <i>2. No wires means a user can move to different places while still being connected</i> <i>3. A router can have multiple devices connected</i> <i>4. No messy wires</i> <p>Disadvantages a wireless network:</p> <ol style="list-style-type: none"> <i>1. Interference and other signal strength issues,</i> <i>2. Connection can drop out or loss quality,</i> <i>3. More open to security threats,</i> <i>4. Slower than a wired network</i> <p>Benefits and risks of wireless networks as opposed to wired networks</p> <p>Advantages of Wireless Network</p> <ul style="list-style-type: none"> Increased mobility - <i>as long as you are still in range you can access the network from anywhere.</i> Increased productivity - <i>increased mobility allows employees to collaborate where and when they need to therefore increasing productivity.</i> Scalability - <i>when expanding a wireless area network very little (if any) additional cabling is required meaning expanding a wireless network is very easy.</i> Health and safety - <i>little wiring in a wireless network therefore less risk of tripping.</i> Hardware - <i>less hardware required i.e. cables therefore cheaper.</i> <p>Disadvantages of Wireless Network</p> <ul style="list-style-type: none"> Security - <i>Risk of 'outsiders' accessing your network unless robust security protocols are enabled (e.g. WPA, WPA2)</i> Stability - <i>The network can be less stable, wireless reception may be impaired by a number of factors including large distances or objects between wireless devices, and other wireless networks.</i> Speed - <i>Wireless networks are typically slower than wired networks, sometimes even up to 10 times slower.</i> 	<p>Class discussion (individual/paired or group)</p> <p>Note the features of a wireless network</p> <p>Note the advantages of a wireless network</p> <p>Note the disadvantages of a wireless network</p> <p>Draw a diagram of a wireless network</p> <p>Note the benefits and risks of wireless networks as opposed to wired networks</p>
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<p>Plenary two (5-10 mins)</p>	<p><i>Assess learning against the learning objectives</i></p> <p><i>This is an open activity whereby the teacher will decide on the best approach to do this based on the pedagogical approach your school takes on assessment.</i></p>	<p>For example:</p> <ul style="list-style-type: none"> • 5 minute timed writing exercise on what has been learned so far • Fill in class notes • Have a discussion • Answer open questions • Answer directed questions
<p>Homework (optional)</p>	<p><i>Teacher choice based on homework policy of school.</i></p>	<p>For example:</p> <p>Note down the types cables used with wired networks</p> <p>Note down where can you connect to a wireless network</p>

Key Terms: Wired and Wireless Networks	
<p>Wired network</p>	<p>It is a network that is physically connected using computers, Ethernet cables, routers and servers</p> <p>Used in many businesses and schools</p> <div data-bbox="427 584 831 949" data-label="Diagram">  <p>The diagram illustrates two network configurations. The top part, labeled 'Wired network', shows a server tower connected to a network switch or router, which is then connected to a desktop computer via Ethernet cables. The bottom part, labeled 'Wireless network', shows a server tower connected to a wireless router, which is then connected to a laptop via radio waves.</p> </div> <p>(Could have a physical set up of a small network like picture above, or do an activity to get students to find the ports and connect devices together)</p>
<p>Copper cables</p>	<p>Copper cable uses electrical signals to pass data between networks. There are three types of copper cable: coaxial (degenerates over distance), unshielded twisted pair (twisted copper cables to reduce degeneration) and shielded twisted pair (uses copper shielding to make them less susceptible).</p>

Fibre Optics	<p>Fibre optic cabling is made from glass that is very flexible, Light is passed through the cable using a transmitter. Light travels quickly through the light-reflecting internal wall of the cable. The transmitter in the router sends light pulses representing binary code.</p>	
	Advantages	Disadvantages
	Thin, so larger quantities can be put together	Not used in all areas
	Less interference Less chance of degeneration	To replace existing copper is expensive
	Advantages	Disadvantages
	Phones can be powered by the copper wires so phones can still work after loss of main power	Degenerates over long distance
	Cheaper than fibre	
Wireless network	<p>It is a network that has no wire connections. Devices can connect via radio waves to a wireless router to provides access on to a network.</p> <div style="text-align: center;">  <p>The diagram shows two network setups. The top setup, labeled 'Wired network', shows a desktop PC connected to a network router by a cable. The bottom setup, labeled 'Wireless network', shows a laptop connected to a network router via radio waves, represented by curved lines.</p> </div> <p>Used in cafes, hotels, some work places, any hotspots</p>	