Penbridge School Computing Curriculum

Unit: Networks and Computers

NC Link:

(KS1) Recognise common uses of information technology beyond school

(KS2) Understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration

What is a network?

Computers and other electronic devices can connect together to create networks that can share information and send messages. Network connections between devices are made with wires and cables, and sometimes they can use wireless connections if they are close together. A network can be small - only two computers - or huge, with hundreds of devices connected together.

Most schools have a computer network that allows staff and pupils to share and access work and resources. The network has one central computer called a server with a large memory drive where all the files and resources are stored. The server is connected to a device called a switch which has lots of connection ports for other devices to plug their cables into so they can communicate with the server.

What is the world wide web?

The world wide web ('www' or 'web' for short) is a collection of webpages found on this network of computers. Your web browser uses the internet to access the web.

The internet is very different to the World Wide Web. The internet is the **infrastructure** of computers and connections – it is the hardware. The WWW is the information (in the form of web pages) on the internet.
These web pages are stored on web servers and can be viewed across the internet by a client computer using a web browser such as Internet Explorer or Google Chrome.

What is the internet?

The internet has been designed to do one job: to transport data from one computer to another.
It is made up of millions of computers all over the world that are digitally connected to each other by cable, fibre or wireless links.
You can use the internet to browse websites, communicate with people, download pictures and videos, listen to music or do lots of other amazing things.
The data that travels via the internet is digital: this means it is expressed as numbers (binary).

Success Criteria Progression:

Year 1	Children will be able to identify technology. Children will be able to identify a computer and its main parts. Children will be able to use a mouse and keyboard.

Year 2	Children will be able to recognise the uses and features of information technology. Children will be able to identify the uses of information technology in school and beyond school. Children will be able to explain how information technology helps us. Children will be able to recognise that choices are made when using information technology.

Year 3	Children will be able to explain inputs and outputs for digital devices. Children will be able to explain how digital devices help us. Children will be able to describe how computer networks and devices keep us connected. Children will be able to recognise the physical components of a network.

Year 4	Children will be able to explain how networks physically connect together. Children will be able to explain what the internet is. Children will be able to describe how the world wide web works.

Year 5	Children will be able to explain that computers can be connected together to form systems. Children will be able to recognise the role of computer systems in our lives. Children will be able to recognise how data is transferred across the internet. Children will be able to explain how we can communicate using technology. Children will be able to evaluate different methods of online communication.

Year 6	Children will be able to describe features of various websites, including hyperlinks, images, text of different styles, buttons etc. Children will be able to describe what HTML is and recognize HTML tags Children will be able to create a webpage using HTML.

Year 1

Follow NCCE (Teach Computing): Computing systems and networks – Technology around us					
Lesson 1	**Lesson 2**	**Lesson 3**	**Lesson 4**	**Lesson 5**	**Lesson 6**
LO: To identify technology. Learners will become familiar with the term 'technology'. They will classify what is and what is not technology in their school and/or classroom. Learners will demonstrate their understanding of how technology helps us in different ways.	LO: To identify a computer and its main parts. Learners will get to know the main parts of a desktop or laptop computer. They will practise turning on and logging in to a computer. The learners will apply their knowledge of the different parts of a computer, to complete a mouse-based task.	LO: To use a mouse in different ways. Learners will be building on the mouse skills they were introduced to in Lesson 2. Learners will review images of a computer to explain what each part does. They will develop an understanding that different computers use different mice, but they perform the same function. They will use the mouse to open a program and create a simple picture.	LO: To use a keyboard to type. Learners will begin to use the computer keyboard for a purpose. They should understand that writing on a keyboard is called typing and will begin to demonstrate their ability to write their name. Learners will then save their work using the save icon and understand that this icon is used in lots of different programs.	LO: To use a keyboard to edit text. Learners will begin by opening a file they have previously created. They will demonstrate their ability to use a keyboard to edit text, by writing a sentence and then deleting letters. They will also use the keyboard arrow keys to move the text cursor in their textbox.	LO: To create rules for using technology sensibly. Learners will be introduced to the concept of using computers safely, within the context of a school setting. They will explore why we have rules in school and how those rules help us, and then apply this understanding to rules needed for using computer technology safely.

Full lesson plans and resources available on https://teachcomputing.org/curriculum/key-stage-1/computing-systems-and-networks-technology-around-us

Year 2

Follow NCCE (Teach Computing): Computing systems and networks – IT around us				
Lesson 1	**Lesson 2**	**Lesson 3**	**Lesson 4**	**Lesson 5**
LO: To recognise the uses and features of information technology. Learners will develop their understanding of what information technology (IT) is. They will identify devices that are computers and consider how IT can help them both at school and beyond.	LO: To identify the uses of information technology in the school. Learners will consider common uses of information technology in a context that they are familiar with. They will identify examples of IT and be able to explain the purpose of different examples of IT in the school setting.	LO: To identify information technology beyond school. Learners will begin to explore IT in environments beyond school, including home and familiar places such as shops. They will talk about the uses of IT in these environments and be able to explain that IT is used in many workplaces.	LO: To explain how information technology helps us. Learners will explore the benefits of using IT in the wider world. They will focus on the use of IT in a shop and how devices can work together. Learners will sort activities based on whether they use IT or not and will be able to say why we use IT.	LO: To recognise that choices are made when using information technology. Learners will think about the choices that are made when using information technology, and the responsibility associated with those choices. They will use IT in different types of activities and explain that sometimes they will need to use IT in different ways.

Full lesson plans and resources available on https://teachcomputing.org/curriculum/key-stage-1/computing-systems-and-networks-it-around-us   Skip lesson 5 of the unit online.

Year 3

Follow NCCE (Teach Computing): Computing systems and networks – Connecting Computers					
Lesson 1	**Lesson 2**	**Lesson 3**	**Lesson 4**	**Lesson 5**	**Lesson 6**
LO: To explain how digital devices function This lesson introduces the concepts of input, process, and output. These concepts are fundamental to all digital devices.	LO: To identify input and output devices. Learners will develop their knowledge of the relationship between inputs, processes, and outputs and apply it to devices and parts of devices that they will be familiar with from their everyday surroundings.	LO: To recognise how digital devices can change the way that we work. Learners will apply their learning from Lessons 1 and 2 by using programs in conjunction with inputs and outputs on a digital device. They will create two pieces of work with the same focus, using digital devices to create one piece of work, and non-digital tools to create the other. Learners will then compare and contrast the two approaches.	LO: To explain how a computer network can be used to share information. Many digital devices are now connected to other digital devices, eg computers through wires, tablets through Wi-Fi, and smartphones through mobile phone networks. The benefit of connecting digital devices is that it allows information to be shared between users and systems. This lesson introduces the concept of connections and moving information between connected devices. Learners will learn to explain how and why computers are joined together to form networks.	LO: To explore how digital devices can be connected. This lesson introduces key network components, including a server and wireless access points. Learners will examine each device's functionality and look at the benefits of networking computers.	LO: To recognise the physical components of a network. Learners will further develop their understanding of computer networks. They will see examples of network infrastructure in a real-world setting and relate them to the activities in Lesson 5.

Full lesson plans and resources available on https://teachcomputing.org/curriculum/key-stage-2/computing-systems-and-networks-connecting-computers

Year 4

Follow NCCE (Teach Computing): Computing systems and networks – The Internet				
Lesson 1	**Lesson 2**	**Lesson 3**	**Lesson 4**	**Lesson 5**
LO: To describe how networks physically connect to other networks.	LO: To recognise how networked devices make up the internet.	LO: To outline how websites can be shared via the World Wide Web (WWW).	LO: To describe how content can be added and accessed on the World Wide Web (WWW).	LO: To recognise how the content of the WWW is created by people.
Learners will explore how a network can share messages with another network to form the internet. They will consider some of the network devices involved in this, such as routers, and will also discuss what should be kept in and out of a network to keep safe.	Learners will describe the parts of a network and how they connect to each other to form the internet. They will use this understanding to help explain how the internet lets us view the World Wide Web and recognise that the World Wide Web is part of the internet which contains websites and web pages.	Learners will explore what can be shared on the World Wide Web and where websites are stored. They will also explore how the World Wide Web can be accessed on a variety of devices.	Learners will analyse a website and identify the key parts. They will then consider what content can be added to websites and what factors they should consider before adding content to a website. Finally, they will use a website which enables them to create their own content online.	Learners will explore who owns the content on the World Wide Web (or 'web' for short). They will explore a variety of websites and will investigate what they can and cannot do with the content on them. They will also relate this to principles of ownership and sharing in the real world.

Full lesson plans and resources available on Teams or https://teachcomputing.org/curriculum/key-stage-2/computing-systems-and-networks-the-internet   Skip lesson 6 of the unit online.

Year 5

Follow NCCE (Teach Computing): Computing systems and networks – Sharing information					
Lesson 1	**Lesson 2**	**Lesson 3**	**Lesson 4**	**Lesson 5**	**Lesson 6**
LO: To explain that computers can be connected together to form systems.	LO: To recognise the role of computer systems in our lives.	LO: To explain the importance of internet addresses.	LO: To recognise how data is transferred across the internet.	LO: To recognise how we communicate using technology.	LO: To evaluate different methods of online communication.
Learners are introduced to the concept of a system. They begin to understand that components can work together to perform a task. Finally, learners explore how digital systems can work and learn about physical and electronic connections.	Learners consider how larger computer systems work. They see how devices and processes are connected, and reflect on how computer systems can help them.	Learners explore what is necessary for effective communication and the importance of agreed protocols. They apply this understanding to IP addresses and the rules (protocols) that computers have for communicating with one another. Learners also use a Domain Name Server (DNS) to translate web addresses into IP addresses.	Learners are introduced to the concept of packets. They complete an activity based on transferring an image across the internet, to see that as well as messages (text), other types of data (images, video, and audio) are also transferred over the internet. They gain an understanding of the key parts of a packet: the header and the data payload.	Learners deepen their understanding of the term 'communication'. They explore different methods of communication, before they consider internet-based communication in more detail. Finally, learners evaluate which methods of communication suit particular purposes.	Learners use information provided in the lesson and their own prior knowledge to categorise different forms of internet communication. They then choose which method(s) they would use for the scenarios discussed in the previous lesson. Through these activities, learners explore issues around privacy and information security.
Yr5 Network Lesson 1	Yr5 Network Lesson 2	Yr6 Network Lesson 1	Yr6 Network Lesson 2	Yr6 Network Lesson 5	Yr6 Network Lesson 6

Full lesson plans and resources available on https://teachcomputing.org/curriculum/key-stage-2/computing-systems-and-networks-sharing-information   and   https://teachcomputing.org/curriculum/key-stage-2/computing-systems-and-networks-communication
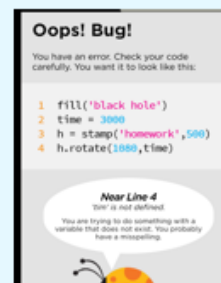
Year 6

Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5	Lesson 6
L.O: To describe the features of a website.	L.O: To understand what HTML language is.	L.O: To use HTML to create a website.	L.O: To use HTML to create a website.	L.O: To use HTML to add images to a website.	L.O: To use HTML to add hyperlinks to a website.
Starter: Children to complete label the parts of a webpage activity.	Starter: What do you know about websites and how they are made? What parts of a website can you think of?	Starter: What do you already know is important when you are using text based coding?	Starter: Circle map – What can you remember about HTML language?	Starter: Matching activity between formatting language and what it does.	Starter: Spot the errors in some HTML language
Input: Discuss answers from starter. What do think might be different on a specific webpage? Open up a website –what features can the children name?	Input: Prediction key – what is HTML? What is text based coding? Watch intro video. This text based coding is the same as you used on Scratch. What was important when you were typing code on scratch?	Input: Introduce children to project – explain what their website will be about. Give children time to jot down ideas and discuss with a partner what they want to include/what it will be about. Discuss with children how websites can be used to communicate and share information. Children to open up Notepad and save their file as _____.html (This means they can open it as a website.)	Input: Re-cap what they learnt last week. Give children time to discuss what more text they might add to their website so far. Demonstrate to children how to format text.	Input: Look at website – give children time to make any changes using their self-assessments from last lesson. Think about the target audience – why might images be useful to have on the website?	Input: Discuss project so far and target audience – why is a website a good way to achieve the goal? Discuss – what is a hyperlink? Why are they used? Why are they helpful? A hyperlink is a piece of text, button or image that links to another page.: Demonstrate to children how to add a hyperlink.
Activity 1: Give children a screenshot of a website to label these key features: Hyperlinks, pictures, title, URL, text content, navigation/ menu, logo, backgrounds, columns Share annotations as a class –were they accurate?					
Activity 2: Children use the list of features to annotate other websites. This time they must explain why these make them a good website. *E.g. exciting logo repeated on pages to engage reader, fun and bright background, clear layouts to help reader etc..*	Activity: See activity below.	Activity: See activity below.	Activity: See activity below.	Activity: See activity below.	Activity: See activity below.
	Less Able:	Less Able:	Less Able:	Less Able:	Less Able:
	More Able:	More Able:	More Able:	More Able:	More Able:
Less Able: More Able:	Plenary: Children to summarise what they have learnt about HTML language into one sentence.	Plenary: Make sure links are saved.	Plenary: Self assessment – evaluate your website so far and link to target audience.	Plenary: Peer assessment of website so far using thinking hats.	Plenary: Self assessment – evaluate website and link to target audience. UPLOAD THEIR FINISHED WEBSITES TO TEAMS
Plenary: 5 top tips for a good website					
Laptops					

ACTIVITY

Children can play on this website to remind themselves how text based coding works. https://bitsbox.com/hoc2016.html#coding
Recap with children the importance of accuracy when typing text based coding and why testing your code can be important.

Oops! Bug!

You have an error. Check your code carefully. You want it to look like this:

```
1  fill('black hole')
2  time = 3000
3  h = stamp('homework',500)
4  h.rotate(1080,time)
```

Near Line 4
'div' is not defined.

You are trying to do something with a variable that does not exist. You probably have a misspelling.

When children understand text based coding, then move onto HTML.. Watch HTML introduction video with children or use Twinkl PowerPoint on HTML

Show children the HTML language for a website they have used (BBC Bitesize/Newbridge school website words well). Look at the HTML language and the website can you spot the different parts of the page in the HTML. Children could explore this independently after on laptops.

Year 6 Lesson 3 –

ACTIVITY

Step 1 - Add the HTML code below to start your first page and give it a title.

```
<html>
<title> History of Computing </title>
```

Step 2 - Use the <body> tag to begin adding content to the page. All code between <body> and </body> is the main content of your website.

```
<body>
Welcome to my website about the history of
computing.
```

Step 3 - Use the <p align=center> before the body text (between <body> and </body>) to put the text in the middle or choose left or right. Note the American spelling of *Center*. End your alignment with putting </p> at the end.

```
<p align=center>
```

ACTIVITY

Step 1 - Add some more text below <body> and use the table below to format your text.
Remember to end each formatting, such as: This text will be bold text
Give children the empty table and let them experiment and fill in the missing descriptions.

<I>	Italic
<b>	Bold
<u>	
<a>	

	
<marquee>	

Step 2 - Use the code below within your < body> tag to change the background colour of your website. Note the spelling of colour (color). You should not use blue as a background colour because your hyperlinks in task 9 will be blue.

```
<body bgcolor=green>
```

Step 3 - Change the colour of different paragraphs of text. <font color=white>welcome to my website </ font>

Hexadecimal Colours: This is a 6 digit code that allows programmers to choose a specific colour from millions. Use the image to find the colour you are looking for then put it in your font or background with # at the start. E.g <font color=#0066FF>

FFFFFF	000000	333333	666666	999999	CCCCCC	CCCC99	9999CC	666699
660000	663300	996633	003300	003333	003399	000066	330066	660066
990000	993300	CC9900	006600	336666	0033FF	000099	660099	990066
CC0000	CC3300	FFCC00	009900	006666	0066FF	0000CC	663399	CC0099
FF0000	FF3300	FFFF00	00CC00	009999	0099FF	0000FF	9900CC	FF0099
CC3333	FF6600	FFFF33	00FF00	00CCCC	00CCFF	3366FF	9933FF	FF00FF
FF6666	FF6633	FFFF66	66FF66	66CCCC	00FFFF	3399FF	9966FF	FF66FF
FF9999	FF9966	FFFF99	99FF99	66FFCC	99FFFF	66CCFF	9999FF	FF99FF
FFCCCC	FFCC99	FFFFCC	CCFFCC	99FFCC	CCFFFF	99CCFF	CCCCFF	FFCCFF

Year 6 Lesson 5 –

ACTIVITY

Step 1 - Add some images to the web-page by saving an image to your files and then following the steps in the youtube video to add it.
https://www.youtube.com/watch?v=YzoJ03b99iM (Use this video to help you understand before you teach!)

<img src="image.jpg">

Step 2 - Use a percentage of the image width and height to adjust the size of your image:

Use the same alignment code you used on your text in task 3 to align your images left, centre or right.

Year 6 Lesson 6 –

ACTIVITY

Step 1 - Add another HTML page by clicking add file and naming the file. The name must end with .html for example page1.html

Give children time add code to their new page – they can copy and paste from the original page and just change the text.

Step 2 - Add a hyperlink to it. Children can choose the text that gets clicked on to take them to their new page. For example: Find out more about _____ here

Code to use:
```
<a href="page1.html"> This is the text that will be clicked to go to the other page </a>
```

Step 3 – Create a hyperlink back to your first page.

CHALLENGE: Can you use an image as a hyperlink?

Step 4 – Peer-assess websites and then give children to finish their website designs