2021-22 CURRICULUM MAP FOR ICT YEAR 13

-HALF TERM 1: <u>All Pathways</u> **Unit 2 – Global Information** **KQ1 – Which individuals and organisations hold information?** <u>(a) Categories of holders</u> -Categories - Individual citizens, businesses, educational institutions, governments, charities, healthcare services and community organisations. -The information held, in the context of each category. <u>(b) Location</u> -Locations - Developing country, developed country, urban, rural, home, workplace. -Access to information and access issues, within each location. <u>(c) The global divide</u> -Comparison of technologies available and access issues across the global divide - between developed and developing countries. **KQ2 - How is information stored?** <u>(a) Types</u> -Paper-based - Forms, handwritten notes, maps, telephone directories. -Optical media - CD, DVD, Blu-ray -Magnetic media - Magnetic hard drives, tapes. -Solid state media - SSD hard drives, memory cards, <u>(b) Characteristics/Purpose</u> -Of each type of storage media <u>(c) Advantages and disadvantages</u> -Of each type of storage media, in relation to its characteristics/purpose. **KQ3 - How can information be accessed?** <u>(a) Device Types</u> -Handheld device - small tablet, smart phone, wearable device, eBook reader. -Portable devices - laptop, large tablet. -Fixed devices - desktop computer, smart TV, games consoles. -Shared devices - database server, data centre, cloud storage devices. <u>(b) Characteristics/Purpose/Uses</u> -Of each type of device <u>(c) Advantages and disadvantages</u> -Of each type of device, in relation to its characteristics/purpose. **KQ4 - What is the internet and how does it allow us to access data?** <u>(a) The Internet</u> -A network of interconnected networks, spanning the world -Internet connections -Characteristics <u>(b) Connection types</u> -Types - copper-cable, optical-fibre, satellite, microwave, mobile data networks. <u>(c) Characteristics</u>	   	Within optional unit, pathway dependant. Within optional unit, pathway dependant. Discussion of the purpose/characteristics of different classifications of data. Links to business studies – how organisations use data. Links to computer science – how data is stored/cyber security.

2021-22 CURRICULUM MAP FOR ICT YEAR 13

-Of each network connection type. -Characteristics - speed, range (distance), storage capacity. **KQ5 - How is the WWW used to share information?** (a) WWW Technologies -Internet - Public, open access. Anyone can access. -Intranet - Private, closed access. Internal to an organisation. -Extranet - Private, part shared access. Organisation control/grant external access. (b) Purpose/characteristics -Of each network type. -Comparison of a networks suitability for given uses -Issues related to access to the network **KQ6 - How can information be presented on the WWW?** (a) Formats -Webpages - Static and dynamic -Blogs -Podcasts -Streamed audio and video - internet radio, catch-up TV -Social media channels - Twitter, LinkedIn, discussion boards -Document stores - upload and download -RSS feeds (b) Purpose -Of each format -How well each format can meet the needs of different holders of information, in a range of situations. **KQ7 – What advantages does using the internet have to different holders of information?** (a) Individuals -Speed of personal communication, easy access to large amounts of information for research, access to internet banking 24/7 etc. (b) Organisations -Share large amounts of information quickly between different countries, accept payments 24/7, charity websites accepting donations 24/7 etc. **KQ8 – What disadvantages does using the internet have to different holders of information?** (a) Individuals -Potential for identity theft, cost of data connection to the internet etc. (b) Organisations -Threats caused by malicious attacks, cost of maintaining websites and data stores etc. **KQ1 - What different forms does information take?** (a) Styles -Text (different character sets) e.g. Western, Cyrillic, Arabic, etc. -Graphic e.g. logo, photograph, diagram. -Video e.g. instructional video live broadcast. -Animated graphic e.g. animated diagram, pop-up advert. -Audio e.g. spoken instructions, music track -Numerical e.g. profit, date and time -Braille text e.g. written report printed on a Braille printer. -Tactile images - for people who cannot view conventional images by sight e.g. NASA's Hubble Space Telescope. -Subtitles e.g. translated speech for a film. -Boolean e.g. yes or no answer on a form.		

2021-22 CURRICULUM MAP FOR ICT YEAR 13

-Tables and spreadsheets e.g. simple database tables and spreadsheets. -Charts and graphs e.g. identifying trends, making comparisons. (b) Purpose/uses -Of each of the different information styles. -The use of the same style for different purposes. **KQ2 - How are different types of information classified?** (a) Classification -Sensitive, non-sensitive, private, public, personal, business, confidential, classified, partially anonymised, completely anonymised -Purpose/characteristics of each (b) Impacts -Impact on holders of information of different types of information. **KQ3 - Which characteristics dictate the quality of information?** (a) Characteristics -Valid, bias, reliable, comparable. (b) Importance -Of good quality information to stakeholders -Innovation, agility, improved strategic decision making and focus. (c) Consequences -Of poor quality information on stakeholders on a stakeholders -Misinformation, reputational damage, accuracy of decision making **KQ4 – How is information managed within an organisation?** (a) Management of Information -Collecting, storing and retrieving e.g. adding a new member to a membership database. -Manipulating and processing e.g. producing a graph from a table of data -Analysing e.g. looking for patterns in data -Securing e.g. storing records on an encrypted hard drive -Transmitting e.g. posting a printed report to a customer (b) Characteristics/Uses -Of each stage of information management, in relation to a range of examples. (c) Impacts -on individuals and organisations e.g. additional costs associated with keeping sensitive information secure, data being processed lawfully etc. **KQ1 - How does data and information differ?** (a) Form -Data - raw, unorganised facts/figures that needs to be processed. -Information - data which is processed, organised and structured into a meaningful context. (b) Differences -Between data and information. **KQ2 - How is information used by different holders (individuals) of information?**		

2021-22 CURRICULUM MAP FOR ICT YEAR 13

(a) Categories of information -Communication e.g. to send an email. -Education and training e.g. to check grades/feedback. -Entertainment e.g. to read a magazine film review. -Planning e.g. to use a shared electronic diary. -Financial e.g. to use a bank statement to help financial planning -Research - e.g. to look up information online -Location dependent - e.g. to search for a service when in a particular location. (b) Benefits/limitations/Uses -Of different categories of information by holders of information. -In a variety of scenarios **KQ3 - How is information used by different holders (organisations) of information?** (a) Categories of information -Knowledge management and creation - e.g. to create an accurate model of key markets. -Management information systems (MIS) - e.g. to monitor staff training, personnel record of all staff. -Marketing, promotion and sales - e.g. to identify patterns or trends in sales figures -Financial analysis and modelling e.g. to determine the top selling products. -Contact management e.g. to keep track of appointments at a doctor's surgery. -Decision making e.g. the percentage of faulty items made each month by a manufacturer -Internal and external communication - e.g. to inform all of something (b) Big data -Data that is either too large or too complex for traditional data analysis techniques to be used, -e.g. the annual web clicks of a major online retailer, health data on the population of an entire country. (c) Benefits/limitations/Uses -Of different categories of information by holders of information. -In a variety of scenarios **Emerging Digital Practitioner Pathway** **Optional Unit 2 – HT1** 3 – Cyber Security 8 – Project Management 9 - Product Development 12 - Mobile Technology 17 – Internet of Everything 18 - Computer Systems Hardware **Application Developer Pathway** **Optional Unit 2 – HT1** 3 – Cyber Security		

2021-22 CURRICULUM MAP FOR ICT YEAR 13

8 – Project Management 9 - Product Development 12 - Mobile Technology 15 - Games Design and Prototyping 17 – Internet of Everything 21 - Web Design and Prototyping		
HALF TERM 2: <u>All Pathways</u> **Unit 2 – Global Information** **KQ4 – What are the different stages of data analysis?** <u>(a) Stages</u> -Identify the need e.g. what information is needed? What do we want to find out?) -Define scope e.g. content, detail, timescales, constraints. -Identify potential sources e.g. sales figures, customer surveys. -Source and select information e.g. determine accuracy and reliability of sources, selecting the best. -Select the most appropriate tools e.g. charts, graphs, regression, trend analysis. -Process and analyse data e.g. set up a spreadsheet to produce a graph etc. -Record and store information e.g. write a report based on the results of the processing -Share results - e.g. with stakeholders <u>(b) Purpose/scope</u> Of each of the different stages of data analysis. **KQ5 - Which data analysis tools are available to an organisation?** -Data tables - e.g. a database table of patients. -Visualisation of data - e.g. a pie chart showing sales figures -Trend and pattern identification - e.g. a line graph of sales per month -Data cleaning e.g. removing customers who have not made a purchase in the last two years. -Geographic information system/location mapping - e.g. tracking the movement of shipped items <u>(b) Use</u> -Of each data analysis tool -Justification of different data analysis tools in a given context. **KQ6 - How can information systems be structured?** <u>(a) Information systems</u> Open systems - -A system that regularly exchanges feedback with its external environment. Closed systems - -A closed system, interactions only happen within the specific system, which means closed systems are shut off from the outside environment. <u>(b) characteristics</u> -Of both open and closes systems <u>(c) Benefits and limitations</u> -Of both open and closes systems	   	Within optional unit, pathway dependant Within optional unit, pathway dependant Within optional unit, pathway dependant Links to business studies - how information is used by different holders (buinesses) of information? Links to computer science – how data is stored/cyber security.

2021-22 CURRICULUM MAP FOR ICT YEAR 13

KQ1 - How does UK legislation and regulation govern the storage and use of information? (a) Legislation -Data Protection Act 1998 / General Data Protection Regulation -Regulation of Investigatory Powers Act 2000 -Protection of Freedoms Act 2012 -Privacy and Electronic Communications Regulations 2003 (amended 2011) -Freedom of Information Act 2000 -Computer Misuse Act 1990 -Information Commissioner's Office (ICO) codes of practice -Copyright, Designs and Patents Act 1988 -Equality Act (EQA) 2011 (b) Compliance -Actions that can be taken by organisations to comply with legislation and regulatory requirements (c) Impact and consequences -On organisations operating in the UK and the way they handle information and individuals' personal data 2 **KQ2 - How does global information protection legislation and regulation govern the storage and use of information?** (a) Legislation -Regulation relating to data protection outside the UK - USA, France, Far East and Africa. -Comparison between data protection legislation/regulation in different countries - similar in many countries, but not all. (b) UNCRPD -UN Convention on the Rights of Persons with Disabilities - specifically recognises (under articles 9 and 21) that access to information, communications and services, including the internet, is a human right. **KQ3 - How does global requirements promote green IT? UK legislation and regulation govern the storage and use of information?** (a) Global requirements on organisations and individuals -United Nations Climate Change Summits -The purpose and scope of. (b) UK Government policy -Environmental Protection Act 1990 -Waste Electrical and Electronic Equipment Directive -Greening Government ICT Strategy 2011 -The purpose and scope of. (c) Benefits -Reducing carbon footprint -Sustainability - Resources -To a company - Enhanced brand image, reduced energy costs. **KQ1 - Where is data collected and what forms does it take?** (a) Data sources -Internal source e.g. internal financial reports, market analysis. -External source e.g. supplier price lists, financial report from a third party. (b) Types of Data		

2021-22 CURRICULUM MAP FOR ICT YEAR 13

-Primary data e.g. reports direct from employees, personal data taken from customers etc. -Secondary data e.g. data received from a market research company, interest rate charged on a loan from a bank etc. -Qualitative data e.g. the colour of products, the names of employees. -Quantitative data e.g. expiry date of medicines, the number of staff working in an organisation. (c) Purpose/characteristics -The purpose and characteristics of each data source. -The purpose, characteristics and use, of each data type. **KQ2 - How can the flow of information in a business be represented diagrammatically?** (a) Data Flow Notation -External entities, processes, data stores, data flows -Standard symbols used (b) Level 1 DFD Connectivity Rules -At least one input or output for each external entity -Data flows only in one direction -Every data flow is labelled -Every data flow connects to at least one process -At least one input data flow and/or at least one output data flow for each process (c) Impacts -Impacts affecting the flow of information in information systems **KQ3 - What are the principles which govern data security?** (a) Principles -Confidentiality – information can only be accessed by individuals, groups or processes authorised to do so -Integrity – information is maintained, so that it is up to date, accurate, complete and fit for purpose -Availability – information is always available to and usable by the individuals, groups or processes that need to use it, when the data is required. **KQ4 - Which risks are associated with the storage of data?** (a) Risks -Unauthorised unintended access to data - espionage, poor information security policy. -Accidental loss of data - human error, equipment failure. -Intentional destruction of data - computer virus, targeted malicious attack -Intentional tampering with data - fraudulent activity, hacking (b) Impacts -Loss of intellectual property, loss of service and access, failure in the security of confidential information, loss of information belonging to a third party, loss of reputation, threat to national security, recent cases of failures of information security -The winder effects of these impacts **KQ5 - How can policies and documentation help protect data that is stored?** (a) Policies -Staff access rights to information, responsibilities of staff for security of information, disaster recovery. -Purpose and scope of each policy (b) Other documentation		

2021-22 CURRICULUM MAP FOR ICT YEAR 13

Information security risk assessment, effectiveness of protection measures, training of staff to handle information. -Purpose and scope of each piece of documentation. **KQ6 - How can physical protection help protect data that is stored?** (a) Methods -Locks, keypads and biometrics used on workstations and server room access -Placing computers above known flood levels -Backup systems in other locations -Security staff -Shredding old paper-based records **KQ7 - How can logical protection help protect data that is stored?** (a) Methods -Computational methods of protecting data. -Tiered levels of access to data, firewalls (hardware and software), anti-malware applications, obfuscation, encryption of data at rest, encryption of data in transit, password protection (b) Purpose/uses Of each protection method. **Emerging Digital Practitioner Pathway** **Optional Unit 2 – HT2** 3 – Cyber Security 8 – Project Management 9 - Product Development 12 - Mobile Technology 17 – Internet of Everything 18 - Computer Systems Hardware **Application Developer Pathway** **Optional Unit 2 – HT2** 3 – Cyber Security 8 – Project Management 9 - Product Development 12 - Mobile Technology 15 - Games Design and Prototyping 17 – Internet of Everything 21 - Web Design and Prototyping		
HALF TERM 3: **Emerging Digital Practitioner Pathway** **Optional Unit 2 – HT3 // Optional Unit 1 – HT3** 3 – Cyber Security 8 – Project Management 9 - Product Development	 	Within optional unit, pathway dependant Within optional unit, pathway dependant

2021-22 CURRICULUM MAP FOR ICT YEAR 13

12 - Mobile Technology 17 – Internet of Everything 18 - Computer Systems Hardware **<u>Application Developer Pathway</u>** **Optional Unit 2 – HT3 // Optional Unit 1 – HT3** 3 – Cyber Security 8 – Project Management 9 - Product Development 12 - Mobile Technology 15 - Games Design and Prototyping 17 – Internet of Everything 21 - Web Design and Prototyping		Within optional unit, pathway dependant
		Within optional unit, pathway dependant
HALF TERM 4: <u>All Pathways</u> **<u>Emerging Digital Practitioner Pathway</u>** **Optional Unit 2 – HT4 // Optional Unit 1 – HT4** 3 – Cyber Security 8 – Project Management 9 - Product Development 12 - Mobile Technology 17 – Internet of Everything 18 - Computer Systems Hardware **<u>Application Developer Pathway</u>** **Optional Unit 2 – HT4 // Optional Unit 1 – HT4** 3 – Cyber Security 8 – Project Management 9 - Product Development 12 - Mobile Technology 15 - Games Design and Prototyping 17 – Internet of Everything 21 - Web Design and Prototyping		Policies and other documentation that are designed to help protect data that is stored
		Within optional unit, pathway dependant
		Within optional unit, pathway dependant
		-
HALF TERM 5: **<u>Emerging Digital Practitioner Pathway</u>** **Optional Unit 2 – HT5 // Optional Unit 1 – HT5** 3 – Cyber Security 8 – Project Management 9 - Product Development 12 - Mobile Technology 17 – Internet of Everything 18 - Computer Systems Hardware		Unit dependant.
		Unit dependant.
		Unit dependant.

2021-22 CURRICULUM MAP FOR ICT YEAR 13

<u>Application Developer Pathway</u> **Optional Unit 2 – HT5 // Optional Unit 1 – HT5** 3 – Cyber Security 8 – Project Management 9 - Product Development 12 - Mobile Technology 15 - Games Design and Prototyping 17 – Internet of Everything 21 - Web Design and Prototyping		Unit dependant.