# J808

# R012 Understanding tools, techniques, methods and processes for technological solutions

# Two-year scheme of work

Contents

[Introduction 2](#_Toc61960549)

[Scheme of work 3](#_Toc61960551)

## Introduction

This scheme of work (which is specifically for use with the ‘Making the grade – examined’ event), offers an example of how the Cambridge Nationals in Information Technologies course could be organised over two years but is in no way prescriptive or definitive. It is designed as a guide only and the order of topics can be changed to suit the centre and teacher preferences. Please always refer to the [specification](https://www.ocr.org.uk/Images/371960-specification.pdf) as your main point of reference.

Resources listed are examples of resources that might be used to stimulate discussions, activities and questions related to the relevant Information Technologies topics. They are not intended as an exhaustive list.

### R012 Understanding tools, techniques, methods and processes for technological solutions – 60 GLH

Learning Outcome 1: Understand the tools and techniques that can be used to initiate and plan solutions

Learning Outcome 3: Understand how data and information can be collected, stored and used

Learning Outcome 4: Understand the factors to be considered when collecting and processing data and storing data/information

Learning Outcome 6: Understand the different methods of processing data and presenting information

## Scheme of work

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### Year 1

| **Lesson No** | **Specification content** | **Aims and objectives  of the lesson** | **Lesson content** | **Activities, links to useful resources** |
| --- | --- | --- | --- | --- |
| 1 | * 1. The phases of   the project life cycle (PLC) | Understand what the PLC is  Define the phases of the PLC. | Ideas Starter: What is the PLC?  Students define in a table each phase of the PLC and explain the aim of that phase. | Group discussion: What each phase of the PLC is?  Individual activity: Create a table and define the phases of the PLC.  Individual activity: Practice [exam question](https://www.ocr.org.uk/qualifications/cambridge-nationals/information-technologies-level-1-2-j808/assessment/) about the PLC (June 2019.   * [The 4 Project Life Cycle Phases (With Templates For Each Stage)](https://venngage.com/blog/project-life-cycle/) * [What is Project Life Cycle and its Main Characteristics?](https://www.invensislearning.com/articles/pmp/what-is-project-life-cycle-and-its-main-characteristics) |
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| 2 | 1. The inputs  and outputs  of each phase  of the PLC | Understand the inputs and outputs  of each phase of the PLC. | For each phase in a table list the information and documents needed in each phase to include. What goes into and What comes out? | Practical activity: Create a table that identify the phases of PLC and what information and documents are needed and produce.  Individual activity: Practice [exam question](https://www.ocr.org.uk/qualifications/cambridge-nationals/information-technologies-level-1-2-j808/assessment/) about the PLC inputs/outputs (June 2019).   * [The 4 Project Life Cycle Phases (With Templates For Each Stage)](https://venngage.com/blog/project-life-cycle/) * [What is Project Life Cycle and its Main Characteristics?](https://www.invensislearning.com/articles/pmp/what-is-project-life-cycle-and-its-main-characteristics) * [What is the Project Life Cycle?](https://www.mavenlink.com/resources/what-is-the-professional-services-project-life-cycle/)   NB: Evaluation phase sometimes called Closure/Termination Phase. |
| 3 | * 1. Phases of the PLC   2. Interaction and iteration between each of the phases of the PLC  1. Inputs and Outputs of each phase of PLC | Understand how each phase of the PLC interacts and iterates with others.  Understand why using the PLC is important and useful. | Ideas Starter: Draw diagram from last lesson of the PLC.  Students explain how the PLC phases affect each other.  Students explain how using the PLC helps to organise your work. | Pairs activity: On the diagram of the PLC, students annotate what documents come out of the phase and how they impact the next phase.  Students can then annotate around the diagram about what happens if there's not enough detail in the previous phase.  Class discussion: How each phase of the life cycle affects the other using examples from Progress Housing example coursework to health discussion.   * [Project Life Cycle: phases and characteristics](https://twproject.com/blog/project-life-cycle-phases-and-characteristics/) |
| 4 | 1. Initial project considerations | Understand the importance of the initiation phase.  Explain what user requirements are and how to set objectives using them.  Explain what success criteria are and their importance. | Ideas Starter: Mind map to show what information do you need at the start of a project?  Students define what user requirements are?  Students define what objectives are?  Students explain what success criteria are and how they differ to objectives?  Students develop objectives and success criteria. | Practical activity: Using Progress Cars (R013) assignment to:   * Define user requirements * Develop objectives from * Create success criteria   Can be repeated with other assignments.  Could give small groups different assignments to look at. |
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| 5 | 1. Initial project considerations | Explain what SMART targets are.  Be able to create SMART targets. | Ideas Starter: Students explain each aspect of SMART target theory.  Students explain why SMART targets are used. | Individual activity: Create a leaflet explaining what SMART targets are?  Individual activity: Practice [exam question](https://www.ocr.org.uk/qualifications/cambridge-nationals/information-technologies-level-1-2-j808/assessment/) about the SMART targets (Jan 2020).  Group work: Use R013 assignment briefs to create SMART targets for those assignments.   * [How to Make Your Goals Achievable](https://www.mindtools.com/pages/article/smart-goals.htm) * [SMART Goal](https://corporatefinanceinstitute.com/resources/knowledge/other/smart-goal/) * [A guide on setting SMART Objectives](https://www.professionalacademy.com/blogs-and-advice/what-are-smart-objectives-and-how-do-i-apply-them) |
| 6 & 7 | 1. Initial project considerations | Understand how constraints and limitations can affect a project.  Explain how these constraint and limitations can be mitigated against. | Ideas Starter: Group discussion on what affects a project.  Students identify and describe factors that can affect a project.  Students explain the steps that can be taken to reduce the issues. | Group/Individual activity:   * For each of the constraints/limitations in specification mind map how each can affect a project. * Outside ring of mind map, add in mitigation techniques and explain how they reduce issues.   Practical: Use past R013 assignment briefs (not current live assignment) to find out issues and what steps can be taken to mitigate. |
|  |  |  |  |  |
| 8 | 1. Planning tools and the software types used to develop project plans | Understand which planning tools can be used to schedule a project.  Explain why these tools would be used in different contexts. | Ideas Starter: Past R013 assignment cards  Students explain what a Gantt chart is and why they are used including the advantages and disadvantages of using them?    Students create a Gantt chart to learn what the components of a Gantt chart are. | Place an R013 Assignment tasks on cards – ask students to place them in order of completion.  Practical activity: Use a past R013 assignment briefs (not current live assignment and provide a 20 hour timescale to plan. Take the card order and place them in timeline for 20 hours.   * [Gantt Charts](https://www.mindtools.com/pages/article/newPPM_03.htm) * [Gantt.com](https://www.gantt.com/) * [Gantt Charts & Bar Graphs: Henry Gantt's Contributions to Management](https://study.com/academy/lesson/gantt-charts-bar-graphs-henry-gantts-contributions-to-management.html) |
| 9 | 1. Planning tools and the software types used to develop project plans | Understand which planning tools can be used to schedule a project.  Explain why these tools would be used in different contexts. | Ideas Starter: On map get from location A to H - 1. In Order, 2 fastest time.  Students explain what a PERT chart is and why they are used including the advantages and disadvantages of using them.  Explain Critical Path planning tool.  Students create a PERT chart to learn what the components of a PERT chart are. | Individual activity: Using a table Identify the components of a PERT chart and explain what each component is.  Individual activity: Practice [exam question](https://www.ocr.org.uk/qualifications/cambridge-nationals/information-technologies-level-1-2-j808/assessment/) about PERT chart (June 2019).  Practical activity: Use an R013 assignment to create a PERT chart for the project.   * [Advantages of PERT Charts vs. Gantt Charts](https://www.lucidchart.com/blog/advantages-of-pert-charts-vs-gantt-charts) * [PERT Chart](https://www.projectmanager.com/pert-chart) * [What is the Difference between Gantt and PERT Chart?](https://www.visual-paradigm.com/project-management/gantt-chart-vs-pert-chart/) |
| 10 | 1. Planning tools and the software  types used  to develop project plans | Understand which planning tools can be used to design a projects solution.  Explain why these tools would be used in different contexts. | Ideas Starter: What do you need to think about when selecting planning tools?  Students explain what   * Task List * Mind map * Flow chart   are and their components.  Explain advantages and disadvantages of each tool. | Group work: Provide scenario about new system- mind map what needs to be designed.  Individual activity: Create a table with columns for the tools showing - Use, Components, Advantages and disadvantages of each.  Practical activity: Provide a scenario / use past R013 assignment.   1. Create a task list of what needs to happen in scenario. 2. Create a flow chart of how data needs to flow through system. |
| 11 | 1. Planning tools and the software  types used  to develop project plans | Understand which planning tools can be used to design a projects solution.  Explain why these tools would be used in different contexts. | Starter: Mind map all planning tools learnt so far.  Students explain what a visualisation diagram is and what it is used for?  Students list the components of a visualisation diagram.  List advantages and disadvantages of using visualisation diagrams. | Group task: Mind map all activities that need to be designed in a project.  Practical activity: Provide a scenario / Use a legacy R013 set assignment.  Create visualisation diagrams for:   1. Screen layout 2. Document layout to present information  * [Visualisation Diagrams and how to use them](http://www.bluesquarething.co.uk/imedia/r081/vis/visdetail.pdf) |
| 12 | 3.1 Data | Understand what data is.  Understand the different types of data and information exist. | Ideas Starter: Card sort of examples of data and information.  Students explain difference between data and information.  Students create table and identify each data type in the specification explaining what it is used for. | Individual task: Create a data dictionary for a car owners’ database.  Set up a database table for car owners.   * [Data types](https://www.teach-ict.com/gcse_new/data_info_knowledge/data_types/miniweb/index.htm) * [Bitesize – Data, information and knowledge](https://www.bbc.co.uk/bitesize/guides/zkfbkqt/revision/1) * [Bitseize – Databases and data capture](https://www.bbc.co.uk/bitesize/guides/z8yg87h/revision/1) * [Data Types](https://www.teach-ict.com/ks3/year7/data_handling/miniweb/pg7.htm)   Validation: <https://www.bbc.co.uk/bitesize/guides/zdvrd2p/revision/1> |
| 13 | 1. Select and justify appropriate software  tools and techniques to process data | Explain what spreadsheet and database software are used for. | Ideas Starter: Mind map examples from internet links ~~of~~ showing the use of spreadsheet and database.  Students to define what spreadsheet and database are together with explaining the advantages and disadvantages of each. | Starter Activity:   * [Bitesize – Spreadsheet software](https://www.bbc.co.uk/bitesize/guides/z4wdrj6/revision/1) * [Bitesize – Information handling software](https://www.bbc.co.uk/bitesize/guides/znvyt39/revision/1)   Individual activity: Students create knowledge organiser about the advantages and disadvantages of using spreadsheets and databases.  Individual activity: Practice [exam question](https://www.ocr.org.uk/qualifications/cambridge-nationals/information-technologies-level-1-2-j808/assessment/) spreadsheets (June 2019) databases (Jan 2020).  Group Discussion: Using R013 scenarios decide if using a Database or spreadsheet is most advantageous . |
| 14 | 1. Select and justify appropriate software  tools and techniques  to present information | Explain what software can be used to present information in different contexts. | Ideas Starter: Students create a list of different software use to present information.  Students Identify the different types of software available and justify while it is useful in different contexts | Pairs/individual activity: Students create a mind map of different software to present information with sub nodes of contexts where they can be used.  Explain why it is suitable for each context on sub nodes?   * [Bitesize – Presenting information on computers](https://www.bbc.co.uk/bitesize/guides/zksk7ty/revision/2) * [Presenting information in different ways](https://www.inclusive.tki.org.nz/guides/speech-language-and-communication-needs/present-information-in-different-ways) * [Different Methods of Presenting Information](https://yourbusiness.azcentral.com/different-methods-presenting-information-16279.html) * [Presenting information using IT](https://www.pearsonschoolsandfecolleges.co.uk/secondary/ICT/BTEC/BTECLevel2FirstIT/Resources/Additionalmaterialforusers/Unit29PresentingInformationUsingIT.pdf) |
| 15 | 1. Select and justify appropriate software tools and techniques  to present information | Understand the factors that affect the selection of software to present information.  Explain how target audiences can be categorised. | Ideas Starter: Mind map factors that could affect choice of presentation software.  Students identify factors that need to be considered when choosing what software to use.  Students explain the different aspects of target audience demographics. | Individual activity: Students create knowledge organiser explaining the different audience demographics.   * [Bitesize – Target audience](https://www.bbc.co.uk/bitesize/guides/zy24p39/revision/2) * [IGCSE CIE ICT: 9. Audience](https://quizlet.com/132144613/igcse-cie-ict-9-audience-flash-cards/) |
|  |  |  |  |  |
| 16 | 1. Select and justify appropriate software tools and techniques to present information 2. The resources required for presenting information | Understand how  the method of presenting information chosen depends on visibility of the output.  Explain how the availability of and need for information affects the choice of presentation method. | Ideas Starter: Use past R013 scenario and highlight where audiences will see information.  Students explain how different factors affect the choice of software used depending on where the information will be viewed and how up-to-date the information needs to be.  Students consider for hardware and software issues that affect information communication. | Group discussions: Mind map of different locations where audiences can consume in some information. Add sub nodes mind map our impacts of audience location and connectivity issues.  Individual activity: Create a table of issues affecting communication of information and against each issue impact on choice of software ~~his~~ is explained. |
| 17 | 1. Select and justify appropriate software tools and techniques to present information 2. The resources required for presenting information | Explain how and why messaging services are used to communicate information.  Explain how and why Voice over Internet Protocol (VoIP) is used to communicate information. | Ideas starter: Group discussion on messaging services and how they can be used in business.  Students explain what messaging services are and how they are used in the business context including the advantages and disadvantages.  Students explain what VoIP is and how it is used by businesses including the advantages and disadvantages. | Individual activity: Students mind map all the different messaging service that is available and then create sub nodes often to show how they can be used in business.  Group discussion: Students discuss and then write down the advantages and disadvantages of different messaging services.  Individual activity: Students create knowledge organiser about VoIP and how it is used in business including the advantages and disadvantages. They can use real world examples of software that is available for business.   * [Business Messaging Apps for 2020](https://uk.pcmag.com/instant-messaging/91744/the-best-business-messaging-apps) * [Five reasons your business should use instant messaging](https://www.techdonut.co.uk/communications/instant-messaging/five-reasons-your-business-should-use-instant-messaging) * [Business VoIP Providers for 2021](https://uk.pcmag.com/internet-telephony-voip/41717/the-best-business-voip-providers) |
| 18 | 1. elect and justify appropriate software tools and techniques to present information 2. The resources required for presenting information | Explain how and why websites are used to communicate information. | Idea starter: Using the Internet find as many examples of business blogs as possible.  Students explain the different types of websites available for business and how they are used in different contexts. | Individual Activity: Students write their own blog post to promote a product of their choice.  Students create a blog post to communicate information from a legacy R013 assignment scenario.  Individual activity: Students create a knowledge organiser about the different types of websites the businesses can use including the advantages and disadvantages of each.   * [Why Blog? The Benefits of Blogging for Business and Marketing](https://blog.hubspot.com/marketing/the-benefits-of-business-blogging-ht) * [20 Business Blogs That Will Blow Your Mind in 2020](https://blog.hubstaff.com/best-business-blogs/) * [10 Top Business Blogs and Why They Are Successful](https://www.socialmediaexaminer.com/10-top-business-blogs-and-why-they-are-successful/) * [Definition intranet](https://whatis.techtarget.com/definition/intranet) * [7 Real examples of Intranets – and what makes them a great tool for team collaboration](https://www.hyperoffice.com/blog/2018/06/20/intranet-examples/) * [10 Best Intranets of 2020: What Makes Them Great](https://www.nngroup.com/articles/intranet-design/) |
| 19 | 1. Select and justify appropriate software  tools and techniques  to present information 2. The resources required for presenting information | Explain how and why multimedia software can be used to communicate information.  Explain how and why Cloud based and Mobile Apps can be used to communicate information. | Idea starter: Mind map of all the different cloud and mobile apps that students have on their phones.  Students explain what multimedia software is and how businesses can use it to communicate information. Have at least four examples from the real world.  Students explain what cloud-based applications are and how it is used by business. This includes the advantages and disadvantages to the business of using cloud-based applications. | Individual activity: Students explain how five apps from their own phones can be used by a business or charity to communicate information.  Pairs activity: Students find five examples from businesses of mobile app use, explaining why the business use it and the advantages to them.  Students find two examples of cloud-based software being used by businesses and explain the impact on the business of using cloud based software. The impact of COVID-19 on business use should allow them to find lots of examples.  [Microsoft 365 Apps for business](https://www.microsoft.com/en-gb/microsoft-365/business/microsoft-365-apps-for-business?activetab=pivot:overviewtab)  [Best cloud computing services of 2021: for Digital Transformation](https://www.techradar.com/uk/best/best-cloud-computing-services)  [The 50 Best Cloud Services for SMBs](https://uk.pcmag.com/it-management/82335/the-50-best-cloud-services-for-smbs)  [Microsoft Teams – More ways to be a team](https://www.microsoft.com/en-gb/microsoft-teams/group-chat-software) |
| 20 | 1. Select and justify appropriate software tools and techniques  to present information 2. The resources required for presenting information | Understand how data can be presented in a visual manner.  Be able to explain why presenting data visually is effective. | Idea starter: Show the group different charts showing information/data and ask them what the data shows.  Students explain how data is shown in a visual way using graphs and charts. Students explain how this is easier to understand and see trends  in been looking at tables. | Individual activity: Provide students with some data and ask them to present it to an audience. This could be something like amount of plastic finding the seas and ask students to create a visual for this to stop.  Students produce summary cards of the benefits of using different graph and chart types.   * [The Ultimate Guide to Using Data Visualization in Your Presentation](https://blog.glisser.com/ultimate-guide-to-using-data-visualization-in-your-presentation) * [Presenting Content Data to Stakeholders? 4 Things to Keep in Mind](http://www.copyright.com/blog/presenting-information-center-data-stakeholders/) * [10 Tips for Presenting Data](https://resources.observepoint.com/blog/10-tips-for-presenting-data) * [What is Data Visualization? (Definition, Examples, Best Practices)](https://venngage.com/blog/data-visualization/) |
| 21 | 1. Select and justify appropriate software tools and techniques to present information 2. The resources required for presenting information | Understand what an integrate document is.  Explain why an integrated document is used to communicate information.  Explain what end user documents are and why it is produced. | Idea starter: Provide the students with an integrated document, ask them to highlight all the different types of data included.  Students explain what an integrated document is and the advantages and disadvantages  of using an integrated document.  Students explain what a user document is and the different types, highlighting why they are used. | Individual activity: Students embed a Spreadsheet and the PowerPoint into a Word process document. Students update the spreadsheet and review what happened to the document. The students conclude the graph from the spreadsheet and look at what happens to the graph when the data in the spreadsheet is updated.  Individual activity: Practice [exam question](https://www.ocr.org.uk/qualifications/cambridge-nationals/information-technologies-level-1-2-j808/assessment/) about integrated documents (Jan 2020)  Students find user documents about using mobile phones on the Internet. Students identify what the user documents do and inform the user about it.   * [Best Examples of User Documentation](https://helpiewp.com/user-documentation/) * [Best User Documentation Examples](https://herothemes.com/blog/best-user-documentation-examples/) * [10 Examples of Great End User Documentation](https://blog.screensteps.com/10-examples-of-great-end-user-documentation) |

Should now have enough understanding and time to complete R013 by the May deadline in Year 1 Summer.

### Year 2

| **Lesson No** | **Specification content** | **Aims and objectives of the lesson** | **Lesson content** | **Activities, links to useful resources** |
| --- | --- | --- | --- | --- |
| 1 | 1. Types of threats   4.1.2 Malware | * Understand what Malware is and the different types of Malware. | Idea starter: mind map all the threats the computer systems faces.  Students explain what malware is and its purpose.  Students explain the different types of malware. | Class activity: Split group into small groups each given facts form of malware to research into and create a presentation slide about. Slides can be given to all students to combine to form notes. Students can also present their information to rest of the class.  Individual activity: Students create knowledge organiser about the different types of malware from the specification. |
| 2 | 1. Types of threats   4.1.3 Social engineering | * Understand what social engineering is and the different types of social engineering. | Idea starter: Students given scenario cards to read out in pairs to see what information that are giving away  Students create table of all the different forms of social engineering listed in specification.  Explain what each is.  Explain what information each tries to take.  Explain situations where it is used. | * [Teaching Security](https://teachingsecurity.org/lesson-3-social-engineering-the-oldest-hack/) * [Social engineering](https://filestore.aqa.org.uk/resources/computing/AQA-8520-SOC-ENG-LP-PA.PDF)   Individual activity: Students produce help sheets or posters to go on office walls explaining to people about dangers of social engineering and how to be aware of it happening to them. |
| 3 | 1. Types of threats   4.1.1 Botnet  4.1.5 DDoS  4.1.6 Pharming | * Understand what and how a * Botnet * DDoS * Pharming attacks take place. | Idea starter: Using the Internet find examples of websites being attacked.  Students explain what DDoS is and how it works.  Students explain what botnets are and how they work, finding real world examples.  Students explain what pharming is and finding real world examples of its use full. | * [Pharming](https://www.computerscience.gcse.guru/theory/pharming) * [Social engineering](https://www.futurelearn.com/info/courses/teaching-cybersecurity/0/steps/57175) * [tes – Pharming](https://www.tes.com/teaching-resource/pharming-7123174) * [Bitesize – System security](https://www.bbc.co.uk/bitesize/guides/zj89dxs/revision/2) * [Famous attacks](https://www.cloudflare.com/en-gb/learning/ddos/famous-ddos-attacks/)   Individually students produce case study documents explaining an attack, its consequences, and how it was prevented.  Students produced different case studies for different types of attack |
|  |  |  |  |  |
| 4 | 1. Vulnerabilities to attack | * Understand the three different categories of attack and risk: * Environmental * Physical * System. | Idea starter: Look around the classroom and suggest different possible vulnerabilities to the computer system in school using the three categories.  Students explain the environmental risks to computer system.  Students explain physical risks to a computer system.  Students explain systematic threats and risks to a computer system. | * [Cyber Security](https://cyber.gc.ca/sites/default/files/publications/Intro-to-cyber-threat-environment-e.pdf)   Individual activity: Students create PowerPoint slides explaining environmental risks to business computers including floods, earthquakes, power outages etc.  Individual activity: use the Internet to find examples of physical storage devices being found by members of the public and explain the impact of this data breach. |
|  |  |  |  |  |
| 5 | 1. Impact and consequences of cyber-security attack | * Understand the IMPACT of cyber security attacks. | Idea starter: In groups create a mind map of all the ways a cyber-security attack can affect a company and an individual.  Students explain how data is affected by a cyber-security attack   * Destroyed * Manipulated * Modified * Stolen   Students explain how organisations’ services are affected by DDoS attack.  Students explain how individuals have their identity stolen. | * [10 steps to cyber security](https://www.ncsc.gov.uk/collection/10-steps-to-cyber-security/introduction-to-cyber-security/common-cyber-attacks-reducing-the-impact)   Individual activity: Students produce case study documents explaining impact of breaches on real world organisations  Individual activity: Students create help sheets explaining the impact of and how to avoid identity theft |
|  |  |  |  |  |
| 6 | 4.3 Impact and  consequences  of cyber-  security attack | * Understand the losses that organisations face due to a cyber-security attack. | Idea starter: In groups, use the Internet to find the effects on all organisations such as British Airways or Talk-Talk have due to cyber-security attacks.  Explain how an organisation Suffers losses by a cyber-security attack.  Explain how an organisation is disrupted by a cyber-security attack. | * [Cyber security for business](https://www.nibusinessinfo.co.uk/content/impact-cyber-attack-your-business) * [9 Cybersecurity Attacks That Can Hurt Your Business and Consumers in 2021](https://www.loginradius.com/blog/start-with-identity/2019/10/cybersecurity-attacks-business/) * [Ways Cyber-Crime Impacts Business](https://www.investopedia.com/financial-edge/0112/3-ways-cyber-crime-impacts-business.aspx)   Individual activity: Student credit table and explain to a business and an individual how they lose financially, reputation wise, and data.  Individual activity: Create a presentation that explains how individuals and businesses are disrupted by cyber-security attacks. |
| 7 | 4.3 Impact and  consequences  of cyber-  security attack | * Understand how the safety of an individual and business is affected by a cyber security attack. | Idea starter: Mind map of all the ways an individual may feel unsafe if they have suffered a cyber-security attack.  Explain how individuals, businesses, equipment, and finance all compromised by a cyber-security attack. | * [The business and social impacts of cyber security issues](https://www.helpnetsecurity.com/2015/02/26/the-business-and-social-impacts-of-cyber-security-issues/) * [Cyber risk and the impact on health and safety](https://www.shponline.co.uk/risk/cyber-risk-and-the-impact-on-health-and-safety/) * [Cyber risk and the impact on health and safety](https://www.barbour-ehs.com/cyber-risk-impact-health-safety/) * [Data on Pfizer/BioNTech Covid-19 vaccine stolen in cyber attack](https://www.computerweekly.com/news/252493445/Data-on-Pfizer-BioNTech-Covid-19-vaccine-stolen-in-cyber-attack) * [BBC News – Pfizer/BioNTech vaccine docs hacked from European Medicines Agency](https://www.bbc.co.uk/news/technology-55249353)   Group activity: List all the accounts such as WhatsApp, Twitter, Amazon, and the bank. For each of those, identify what information could be stolen and how as well as individual’s safety is compromised.  Individual activity: Create a slideshow explaining how the safety of equipment, finance, and data is affected by a cyber-security attack on a business. |
| 8 | 4.4 Physical prevention methods | * Understand the physical protection measures that can be used to protect computer systems. | Idea starter: mind map all the physical things you can do to protect the computer system.  Explain the different physical measures and how they can be used in different situations. | Individual activity: Students create a table listing all the possible physical protection methods. For each method students explain what the method prevents, where it can be used, and the cost.  Individual activity: Students want to answer past paper questions from a range of scenarios. |
| 9 | 4.4 Logical prevention methods | * Understand the logical protection measures that can be installed and used to protect the computer system. | Idea starter: Group create mind map of all the logical methods they use in their life to protect their computer access.  Understand and explain how logical prevention methods can be used to protect computer systems and individuals.  Understand how these prevention methods can be used in different contexts. | Individual activity: individuals produce presentation explaining different logical protection methods an individual can use to protect the computer system and data.  Group activity: produce a poster to be displayed on walls explaining to businesses what logical methods are used to protect company data and how to follow them. |
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| 10 | 4.4 Secure  destruction of  data prevention  methods | * Understand the importance of ensuring data is destroyed securely. | Idea starter: Students in groups mind map what data about themselves could be found in their waste bin at home or on their phone if they lost it.  Understand how to destroy data securely.  Explain why data needs to be destroyed securely and the methods that can be used to do this. | * [Data security methods: destruction, degaussing, crushing and shredding](https://ictreverse.com/data-security-methods/) * [Secure date disposal and destruction: 6 methods to follow](https://kirkpatrickprice.com/blog/secure-data-destruction-guide/) * [What are the different types of data destruction and which one should you use?](https://www.dataspan.com/blog/what-are-the-different-types-of-data-destruction-and-which-one-should-you-use/)   Individual activity: Student list all the places data was held about them (physically and digitally). For each location of data storage explain how the data can be destroyed fully.  Individual activity: Students create help guide for starting a business about why data should be destroyed fully and the impact if it is not. |
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| 11/12 | 4.5 Current  relevant IT  legislation | * Understand the IT legislation that affects the use of computer systems in the UK. * Understand the impact of not complying to the legislation that affects computer system use in the UK. | Idea starter:  Group discussion about what laws cover computer use in this country.  explain the different laws better apply to computer systems and the use of computer systems in the UK.  Explain the impact on an individual and organisation if the legislation is not complied with. | * [Bitesize – Ethical, legal, cultural and environmental concerns](https://www.bbc.co.uk/bitesize/guides/zhx26yc/revision/6) * [Bitesize – Ethical, legal and environmental impacts of digital technology](https://www.bbc.co.uk/bitesize/guides/zbgg4qt/revision/2) * [Issues of privacy](http://www.snb.guru/gcse/3_7_4_Privacy_issues.php) * [Impact of Digital Technology](https://studyrocket.co.uk/revision/gcse-computer-science-aqa/written-assessment/impact-of-digital-technology) * Endorsed Hodder [textbook](https://www.ocr.org.uk/qualifications/cambridge-nationals/information-technologies-level-1-2-j808/textbooks/): Pg79 - 84   Small group activity: in small groups students create presentation that explains one of the relevant legislation in the UK. Presentation includes what the legislation says, how to comply to it, and impact if do not comply. Students present presentation to class.  Individual activity: [practise questions](https://www.ocr.org.uk/qualifications/cambridge-nationals/information-technologies-level-1-2-j808/assessment/) from previous R012 exam papers. |
|  |  |  |  |  |
| 13 | 4.5 Current  relevant IT  legislation | * Understand the ethical and moral issues surrounding item. | Idea starter: Good discussion on scenario- phone engineer receives poor review from customer and phones them up to ask why. This is not company policy. They had the phone number on the worksheet telling them what they needed to do and where.  Discuss the above scenario.  Understand the ethical and moral issues that surround information technologies and computer systems. | * [Bitesize – Ethics and law](https://www.bbc.co.uk/bitesize/guides/zkhykqt/revision/1) * [Bitesize – Ethical, legal, cultural and environmental concerns](https://www.bbc.co.uk/bitesize/guides/zhx26yc/revision/2) * [OCR – Ethical, legal, cultural and environmental concerns](https://cambridgegcsecomputing.org/ethical-legal-cultural-and-environmental-concerns)   Individual activity: Revision cards, students explain what defamation of character is with examples from social media. Students explain what cyber bullying is with real world examples. Students explain what trolling is with real world examples.  Group activity: Discussion on the ethics of file sharing. |
| 14 | 4.6 Importance of  validity,  reliability and  bias when  collecting and  using data  and  information. | * Know and understand the importance of validity reliability and bias when collecting and using data and information. | Idea starter: Provide a list of organisations and in groups ask students to decide if they're not trustworthy or bias in their views. Class discussion on reasons for decisions.  Explain what validity, reliability and bias are.  Understand how validity, reliability ability and bias affect the quality of information and data. | * [Validity and Reliability](http://learntech.uwe.ac.uk/da/Default.aspx?pageid=1429) * [18 Data Validations That Will Help You Collect Accurate Data](https://humansofdata.atlan.com/2018/05/18-data-validations-collect-accurate-data/) * [Reliability vs validity: what’s the difference?](https://www.scribbr.com/methodology/reliability-vs-validity/)   Group activities: Explain how to increase reliability and validity when collecting data. |
| 15 | 3.1 What data is  3.2 what  information is | * Understand what data is. * Understand what information is. * Understand the difference is between data information and how data becomes information. | Idea starter: Provide a sheet of data and information and ask students to identify the data and the information. Why is it different?  Explain the difference between data and information. | Individual activity: Create mini quiz explaining different data types and their uses. |
| 16 / 17 | 3.3 The methods  used to collect  data and store  information | * Understand the different methods that can be used to collect data in different contexts. * Understand the different methods that can be used to store data and information in different contexts. | Idea starter:  Provide scenario and ask small groups how to collect the data needed.  Explain how data can be collected in different contexts.  Explain how the method selected to collect data depends on the different contexts. | * [Databases](https://teach-ict.com/gcse_new/databases/data_capture/miniweb/index.htm) * [Tutor2u](https://www.tutor2u.net/business/ict/intro_information_data_collection.htm) * [Bitesize – Databases and data capture](https://www.bbc.co.uk/bitesize/guides/z8yg87h/revision/3) * [Simplified social media terms and conditions for Facebook, Instagram, Snapchat, YouTube and WhatsApp](https://www.childrenscommissioner.gov.uk/report/simplified-social-media-terms-and-conditions-for-facebook-instagram-snapchat-youtube-and-whatsapp/) * Holder textbook page 41 to page 59   Individual activity: Students produce a two by two grid. Column titles are automatic and manual. Row titles are primary and secondary. Students complete grade listing types of collection methods that could be used depending on whether they are automatic or manual, primary or secondary.  Group activity: Investigate how supermarkets collect data about your shopping. Explain what the data is used for by the supermarket.  Group activity: Look at what data is collected about you by social media companies. Explain how they use that data.  Individual activity: Create a survey to gather information in school about Internet use at home. Explain the data types that will be used to store the data and information. |
| 18 | 3.3 The methods  used to collect  data and store  information | * Understand how technology is used to support data collection. | Idea starter: Students look at their own life and mind map what technology they have but collect data about them.  Explain how technology is used to collect data in modern society. | * [6 Automated Data Capture Methods for Business Development](https://indatalabs.com/blog/6-automated-data-capture-methods-for-business-development) * [Advantages of Automated Data Collection Systems](https://www.management-hub.com/automated-data-collection-systems-its-uses.html)   Individual activity: Students explain how shops use bar codes and QR codes to collect and store data.  Small group activities: Investigate how data is collected in cities about people’s movement and create presentation about the results. |
| 19 | 3.4 The different  storage  methods and  the use of  these in  different  contexts | * Understand how data and information can be stored. | Idea starter: Ask students to list where they think data is stored about them.  Understand where data restored and the benefits and limitations of each storage location. | * [Advantages and disadvantages of online data storage](https://beginnersbook.com/2013/04/advantages-and-disadvantages-of-online-data-storage/) * [Advantages of Physical Storage Media vs. Online Data Storage](https://www.securedrive.com/blog/advantages-physical-storage-over-online) * [Bitesize – Data storage](https://www.bbc.co.uk/bitesize/guides/z7rk7ty/revision/6) * [Bitesize – Wired and wireless networks](https://www.bbc.co.uk/bitesize/guides/zvspfcw/revision/6)   Individual activity: Create an information leaflet about different physical devices that can be used to store data and information. leaflet includes features and uses of these devices.  Individual activity: Create an infographic explaining how cloud storage works including its advantages and disadvantages for a business. |
| 20/21 | 3.5 The use   of data  applications  and data  stores in  different  contexts | * Understand how data stores and applications are used in different contexts in real world situations. * Understand the benefits and drawbacks of data collections to the individual and to business. | Idea starter:  Students consider how data about their progress in school is collected and stored.  Explain how data is collected and stored in education.  Explain how data is collected and stored in law enforcement.  Explain how data is collected and stored in retail. | * [What is ANPR and how does it work?](https://www.rac.co.uk/drive/advice/cameras/what-is-anpr-and-how-does-it-work/) * [Automatic number plate recognition (ANPR)](https://www.smartparking.com/smartpark-system/anpr) * [PND – Police National Database](https://www.college.police.uk/What-we-do/Learning/Professional-Training/Information-communication-technology/Pages/PND-Police-National-Database.aspx) * [Big Data in Retail: Common Benefits and 7 Real-Life Examples](https://www.talend.com/resources/big-data-retail/) * [Data and Analytics in the Retail sector](https://www.pwc.co.uk/issues/data-analytics/industries/data-and-analytics-in-the-retail-sector.html) * [The Power of Big Data in Retail](https://www.yodlee.com/data-analytics/the-power-of-big-data-in-retail)   Individual activity: Create a flow-chart showing how shops collect data about peoples shopping and how it is used to help shops improve.  Small group activity: Research into how automatic number plate recognition works and the benefits and drawbacks of the use of automatic number plate recognition. |
|  |  |  |  |  |
| 22/23 | 3.5 The use of  data  applications  and data  stores in  different  contexts | * Understand how data stores and applications are used in different contexts in real world situations. * Understand the benefits and drawbacks of data collections to the individual and to business. | Explain how data is collected and stored in health and fitness.  Explained how data is collected and stored for entertainment and leisure.  Explain how data is collected and stored for our everyday lifestyle. | * [A guide to smart meter data](https://www.ovoenergy.com/guides/energy-guides/a-guide-to-smart-meter-data.html) * [Generating value from smart meter data](https://www.cse.org.uk/projects/view/1210) * [Smartwatch brands under fire for “surprising” ways user data is shared](https://usa.watchpro.com/smartwatch-brands-under-fire-for-surprising-ways-user-data-is-shared/) * [Big Data and Wearable Health Monitors: Harnessing the Benefits and Overcoming Challenges](https://healthinformatics.uic.edu/blog/big-data-and-wearable-health-monitors-harnessing-the-benefits-and-overcoming-challenges/)   Individual activity: Look up Netflix or Amazon prime and explain how personal recommendations for programmes are created.  Small group activity: Look at how Smart Meter are used to measure power usage in the house and the advantages and disadvantages of these. Refer to R013 sample assignment on Progress Housing for example data  Individual activity: Students create infographics about the data collected from smart watches in society. This includes benefits and drawbacks updated collection. |



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