INFORMATION TECHNOLOGY: CAMBRIDGE NATIONALS — YEAR 10

What are the aims and intentions of this curriculum?

The main aims of the Cambridge National in IT are to encourage students to:

- Understand and apply the fundamental principles and concepts of IT, including the use of IT in the digital world, Internet of Everything, data manipulation and Augmented Reality ;
- Understand, apply and use IT appropriately and effectively for the purpose and audience;
- Develop learning and practical skills that can be applied to real-life contexts and work situations;
- Think creatively, innovatively, analytically, logically and critically;
- Develop independence and confidence in using skills that would be relevant to the IT sector and more widely;
- Plan, design, create, test and evaluate/review IT solutions and products which are fit for purpose and meeting user/client requirements and apply design and Human Computer Interface (HCI) considerations appropriate for a defined audience;
- Understand the impacts of digital technologies on the individual, organisations and wider society.

Term	Topics	Knowledge and key terms	Skills developed	Assessment
Autumn 1	Data manipulation using spreadsheets. Design tools and the human computer interface. How to create a spreadsheet solution to a given problem.	Students learn the different types of outputs that clearly present information for an organisation. They learn the meaning and function of the human computer interface and its common characteristics. Students learn how to handle and manipulate data effectively using spreadsheets.	Students learn: Planning and designing considerations and solutions - functionality - navigation system - outputs from the system. Design tools - use of assets to be used when creating a solution for a client - client requirements for a solution. - how information needs to be presented for the client - alternative methods of presenting information. - the purpose of a main menu - navigation to other parts of a client solution - navigation back to the main menu. - house style. Human Computer Interface (HCI) design conventions and principles - what data needs to be manipulated to meet the client requirements	Assessment Activity: Different design tools and their characteristics. Assessment Activity: What is a computer interface and different design considerations. Assessment Activity: Spreadsheet activity/activities testing data handling and manipulation techniques using spreadsheets.

			- data provided by the client - the concept that calculations need to be carried out within the solution. - what output is required to meet the client requirements - what information has to be calculated - how will the calculation be carried out – plain English calculations rather than spreadsheet functions - the use of flowcharts to represent calculations to be carried out. - why user aids are included in a spreadsheet solution - the role of data validation - the role of data entry messages. - the variety of outputs that may be required - the use of charts, lists, invoices, reports and worksheets as output in an organisation - chart formatting and labelling - when it is appropriate to use various types of output. - page size - print area on a page - print area - margins - headers/footers - gridlines - orientation - scaling - house style/branding - colour - font size - alignment (vertical and horizontal) - logos/images - cell formatting. PSHE Links – Students learn the characteristics of positive and healthy friendships (in all contexts, including online) including: trust, respect, honesty, kindness, generosity, boundaries, privacy, consent.	Exemplar Assignment.

			      Career Links - Data Manager, Accountants, Banking, Statistician, Market Makers (Stock Brokers).	
Autumn 2	How to test a spreadsheet solution. How to evaluate a spreadsheet solution. How to create a spreadsheet solution.	Students learn the different types of outputs that clearly present information for an organisation. They learn the meaning and function of the human computer interface and its common characteristics. Students learn how to handle and manipulate data effectively using spreadsheets. Students can test and evaluate the effectiveness of a spreadsheet solution.	Students learn: How to create outputs which are fit for audience and purpose including user interfaces. How to create and follow effective test plans and accurately record their findings. Creating the spreadsheet solution • explore the manipulation of data using simple formulas • make us of operators (+,-,*,/) and parenthesis • introduce the use of cell formatting. • meaningful worksheet names in a workbook • named cells/group of cells • cell references (relative, absolute, named, multi-sheet referencing). • use built in functions SUM, MIN, MAX, AVERAGE, COUNT, IF, COUNTIF, LOOKUP, VLOOKUP, HLOOKUP, AND, OR, DATE, TODAY, SUMIF, SUBTOTAL. • use relational operators including =, <, >, <=, >=, <> • solve formula errors (#DIV/0, #NAME?, #REF! etc). **use:** • sorting • filters. use:	Assessment Activity: Spreadsheet activity/activities testing different types of output, user interface navigation tools and testing considerations and how to evaluate a spreadsheet product. R060: NEA Assessment. Data manipulation using spreadsheets.

- range check
- text length
- lookup techniques
- limited choice
  - drop down lists
  - radio buttons
- tick list.

consider:
- testing during development
  - technical testing
  - usability testing
- how to record evidence of testing
- documentation to support testing/test plan
- how and when to retest.

use:
- conditional formatting
- importing different file types
- entering different data types
  - Boolean
  - Date
  - Time
  - Text
  - Numeric -
    Integer, Number/Real, Currency, Percentage, Decimal
- further cell formatting such as alignment, border, font, shading, text wrap and currency.

Use:
- what-if and goal seek to predict different outcomes
- pivot tables.
- create outputs which are fit for purpose
- create and format a variety of charts and graphs
- creating output documents that follow a house style and page layout properties as given
- ensuring the information in the rows and columns headings are visible or hidden as needed.
- buttons

- macros
- hyperlinks
- forms
- a method to configure the spreadsheet to display the menu at start up.

could:
- explore types of test data – extreme, invalid (erroneous) and valid
- consider what technical testing involves
  - navigation features
  - spreadsheet calculations
  - content included in the output
- carry out testing after development
- complete test plan documentation, including details of
  - test number
  - test description
  - test data
  - expected result
  - actual result
  - any remedial action carried out
  - retesting (if required)
  - explore the appropriateness of test data to be used within a test plan.

PSHE Links – Students learn the characteristics of positive and healthy friendships (in all contexts, including online) including: trust, respect, honesty, kindness, generosity, boundaries, privacy, consent.

Students learn more about Financial Decision Making and the calculation of income in different scenarios. They also learn about the impact of financial decisions.

British Values: Mutual Respect and Tolerance
Students recognise they have the power to influence so should consider how their behaviour, actions and words can affect others.

Career Links - Data Manager, Accountants, Banking, Statistician, Market Makers (Stock Brokers).

Spring 1	Data manipulation using spreadsheets. Creating a spreadsheet solution.	R060: NEA Assessment. Data manipulation using spreadsheets (working on). Students learn the different types of outputs that clearly present information for an organisation. They learn the meaning and function of the human computer interface and its common characteristics. Students learn how to handle and manipulate data effectively using spreadsheets. Students can test and evaluate the effectiveness of a spreadsheet solution.	R060: NEA Assessment. Data manipulation using spreadsheets (working on). Evaluating the spreadsheet solution considering the following points: · how suitable the spreadsheet solution is for the requirements of a client · whether the planned spreadsheet solution has been created any deviation for the planned solution is explained and justification for any deviation is provided. . how the navigation system meets the client requirements · the effectiveness of the visual style of the solution · to what extent house style has been followed. PSHE Links – Students learn the characteristics of positive and healthy friendships (in all contexts, including online) including: trust, respect, honesty, kindness, generosity, boundaries, privacy, consent. Students learn more about Setting goals. Learning strengths, career options and goal setting as part of the GCSE options process. Aids Work experience preparation as helps students preparation for work experience and readiness for work British Values: Democracy Students recognise that they can use their voices to share their thoughts and impact the future. Career Links - Data Manager, Accountants, Banking, Statistician, Market Makers (Stock Brokers).	R060: NEA Assessment. Data manipulation using spreadsheets.
Spring 2	Using Augmented Reality to present information.	The purpose and uses of Augmented Reality (AR). Types of Augmented Reality (AR) and user interaction. Devices used with Augmented Reality (AR).	Students learn: • The different sectors that use AR and how they use it. • The different types of devices AR can be usedon. Planning and design considerations • what augmented reality is and how it is different to virtual reality. • Get the students to research the different uses of AR in the different sectors and how AR is used.	Assessment Activity: What is AR and its uses. Assessment Activity: Types of AR and the devices used with augmented reality.

| | | Students undertake a creative project that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users. IN addition they learn to create, re-use, revise and re-purpose digital artefacts for a given audience, with attention to trustworthiness, design and usability. | • the different types of AR

Purpose
• User Requirements
• Target Audience
• Content

Assets
• Assets
• Charts and graphs
• Hyperlinks / weblinks

Text
• Assets
• Audio
• Video
• Photographs / images

Layers / User Interaction
• Triggers
• Object recognition / marker-based
• Location (GPS) based / Markerless
• Superimposition
• Layers/user interaction
• Action flow
• Static interactive
• the purpose of layers and how users can interact with augmented reality and navigate through the layers
• explain the importance of the action flow to navigate the layers
• explain the difference between a static an interactive layer.
• the types of triggers that could be used and for what purpose
• the type of user interaction for navigating then layers and initiating the triggers
• how they have considered the action flow of the AR app design
• whether they are using static, interactive or both forms of user interaction and layers. | |

- Components
- Flow charts
- Mind maps
- Mood boards
- introduce the final three different types of design tools and their components
- explain the advantages and disadvantages of each type of design tool
- summarise the software that can be used to create the different design tools.

PSHE Links - Students learn the legal rights and responsibilities regarding equality (particularly with reference to the protected characteristics as defined in the Equality Act 2010) and that everyone is unique and equal.

Students can identify a range of online risks, including that any material someone provides to another has the potential to be shared online and the difficulty of removing potentially compromising material placed online.

Students understand the importance of not providing materials to others that they would not want shared further and not to share personal material which is sent to them.

Students can identify the characteristics of positive and healthy friendships (in all contexts, including online) including: trust, respect, honesty, kindness, generosity, boundaries, privacy, consent.

Students learn more about Setting goals. Learning strengths, career options and goal setting as part of the GCSE options process. Aids Work experience preparation as helps students preparation for work experience and readiness for work

British Values: Individual Liberty
People are responsible for advances in science and technology. Students recognise that it is important that

<td style="background:red"></td>			 **Careers Links – Programmer, Software Engineer, Robotics Engineer.**	
Summer 1	Using Augmented Reality to present information. Designing an Augmented Reality (AR) model prototype. Creating an Augmented Reality (AR) model prototype. Testing and reviewing an Augmented reality product.	Planning and design considerations to be considered when designing and producing an AR product. Tools used to design the content and action flow for an AR product. Producing an Augmented Reality (AR) model prototype for standard design conventions. AR information output formats. How to carry out testing of an AR model prototype. Reviewing the process of creating the Augmented Reality (AR) model prototype.	Students learn: - The purpose and user requirements of an AR product including meeting the needs of the target audience. - How to identify the content and assets required to create an effective AR product. - How to use appropriate design tools to support the creation of an AR product. - Create an AR product based on produced design documentation. - How to effectively test an AR model prototype. **Augmented Reality (AR)** - Purpose - Sectors - Uses - Training - Virtual tours - Visualisation - Marketing - Object recognition - Marker-based - Location based - Markerless - Superimposed - User interaction Layers - Static **Interactive** - Mobile devices - Smart devices - Laptop / PC **Designing an AR model prototype**	Assessment Activity: Planning and design considerations for AR products. Assessment Activity: Design tools revision activity. Assessment Activity: How to test an AR model. R070: NEA Assessment Exemplar Assignment. Using Augmented Reality to present information (working on).

- User requirements
- Purpose
- Target audience
- Content
- Assets
- Charts and graphs
- Hyperlinks/weblinks
- Text
- Audio
- Video
- Photographs / images
- Triggers
- Object recognition/marker-based
- Location (GPS) based / Markerless
- Superimposition
- Layers/user interaction
- Action flow
- Static Interactive

Creating an AR model prototype

- what a prototype is and its importance
- the different types of prototypes and their purpose
- the characteristics of a prototype
- the most appropriate prototype for the design and development of an AR app.
- ways in which a prototype could be created.
- Triggers
- Characteristics
- Unique
- Object recognition
- Marker-based
- Location based
- Markerless
- Superimposition
- Single layers
- Multiple layers
- Access to layers
- Static
- Interactive

- Swipe
- Click/select
- Voice

Testing and reviewing
- Technical testing
- User testing
- Test plan
- Test number
- Expected result
- Actual result
- Remedial action
- Effectiveness
- Processes
- Tools
- Techniques
- Defined purpose

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Students recognise that they can use their voices to share their thoughts and impact the future.

Careers Links – Programmer, Software Engineer, Robotics Engineer. | |