



## Course Outline

### ICT Year 9

*Inspiring excellence, empowering global minds*

#### Overview

The Edexcel Inspire computing course for Year 9 is designed to spark a passion for technology and foster critical thinking skills in young learners. This course offers a dynamic blend of theoretical knowledge and practical experience, enabling students to explore the fundamentals of Computer Science. Students will delve into topics such as Web Designing, algorithms, Hardware and Database design, applying their learning through hands-on projects and problem-solving tasks. By engaging with a variety of computing concepts, students will develop essential technical skills and a deeper understanding of how technology shapes our world.

#### Learning Outcomes

- **Develop Basic Web Design Skills:** Students will be able to create and style web pages using HTML and CSS, understanding the principles of web layout, formatting, and design to build functional and aesthetically pleasing websites.
- **Create Interactive Web Elements:** Students will gain the ability to enhance web pages with interactive features using JavaScript, including dynamic content updates, event handling, and form validation to improve user experience.
- **Design and Implement Databases:** Students will be proficient in designing a relational database schema, including creating tables, defining primary and foreign keys, and establishing relationships to organize and manage data effectively.
- **Query and Manipulate Data Using SQL:** Students will be skilled in writing and executing SQL queries to perform operations such as retrieving, inserting, updating, and deleting data, applying commands like SELECT, JOIN, and GROUP BY to manipulate and analyze information.
- **Understand and Apply Search Algorithms:** Students will comprehend and implement search algorithms, including linear search and binary search, to efficiently locate and retrieve data from various data structures.
- **Implement Sort Algorithms:** Students will be able to apply sorting algorithms such as bubble sort, insertion sort, and quicksort to arrange data in a specific order, and evaluate their performance based on efficiency and suitability for different use cases.
- **Explore Data Storage Methods:** Students will understand various data storage methods, including file systems and cloud storage, and how these methods impact data management, retrieval, and security.
- **Understand Digital Sound Representation:** Students will learn how sound is represented digitally, including concepts like sampling rate and bit depth, and will explore basic techniques for sound recording, editing, and processing.

- Apply Input-Process-Output (IPO) Model: Students will use the IPO model to analyze and design computing systems, understanding how data is inputted, processed, and outputted, and applying this model to solve real-world problems.
- Handle File Input and Output: Students will develop skills in managing file operations, including reading from and writing to files, ensuring effective data storage, retrieval, and manipulation for various applications.

### Ongoing Objectives

There are objectives that are covered and built upon throughout each unit of work.

- To learn how to create simple web pages using HTML and CSS and understand how websites are structured.
- To practice using JavaScript to make web pages interactive, such as by creating forms that check user input.
- To design and set up a basic database with tables to organize information effectively.
- To practice writing SQL commands to search for, add, update, and delete information in a database.
- To understand and apply search techniques to find specific items quickly in a list or database.
- To practice using different methods to sort data, such as arranging numbers from smallest to largest.
- To understand how data is saved on computers and online, and explore different storage options.
- To learn how digital sound works and practice editing audio files.
- To use the Input-Process-Output model to understand how data moves through a system.
- To practice reading from and writing to files for effective data management.

### Unit Overviews

#### Term 1

#### Unit 6: Web authoring

**Approximate length: 12-14 weeks**

Students develop skills in using HTML and web authoring software (WYSIWYG), using a range of media (text, images, animations, sound and video) to meet audiences' needs. They learn the basics of HTML tags and how to edit them for a purpose. They consider audience needs in creating a website about the impact of computers and a personal portfolio page that reflects new learning completed in Year 9.

Specific National Curriculum Objectives Covered:

- **Understand HTML Basics:** Students will be able to identify and use fundamental HTML tags (such as <html>, <head>, <body>, <h1>, <p>, <a>, and <img>) to create and structure a basic webpage.
- **Apply WYSIWYG Tools:** Students will demonstrate the ability to use WYSIWYG (What You See Is What You Get) web authoring software to create and edit web pages, incorporating a variety of media types including text, images, animations, sound, and video.
- **Integrate Media Effectively:** Students will be able to integrate and format multimedia elements (such as images, videos, and audio) into their web pages, ensuring that they enhance the content and meet the needs of their target audience.
- **Develop Audience-Centric Content:** Students will analyze and apply strategies for designing web pages that effectively address the needs and preferences of specific audiences, with a focus on the impact of computers for one project and a personal portfolio for another.
- **Edit and Refine HTML Code:** Students will practice editing HTML code to achieve specific formatting and functionality goals, demonstrating the ability to troubleshoot and resolve common issues in web development.
- **Create a Thematic Website:** Students will design and build a website dedicated to exploring and presenting the impact of computers, incorporating relevant content, multimedia elements, and user-friendly navigation.
- **Design a Personal Portfolio Page:** Students will create a personal portfolio webpage that showcases their learning achievements from Year 9, reflecting their growth and development through a well-organized and visually appealing layout.
- **Evaluate and Revise Web Projects:** Students will critically evaluate their own and peers' web projects based on criteria such as usability, design aesthetics, and content relevance, and use feedback to make iterative improvements.

## Term 2

### Unit 5: Databases

**Approximate length: 12-14 weeks**

This unit students will develop techniques in using and creating a database. They will learn the vocabulary associated with a database. They will create two databases: one flat file and the other relational. They will also learn about real-world uses of databases, and how they can be manipulated for different purposes. Students will learn about data types and how to collect data.

#### Specific National Curriculum Objectives Covered:

- To learn and define key database terminology, including concepts such as tables, fields, records, primary keys, foreign keys, and queries, and understand their roles in database management.
- To practice designing and creating a flat file database, including steps for setting up tables, defining fields, entering data, and ensuring data integrity within a single table structure.

- To develop a relational database by designing multiple interconnected tables, establishing relationships between tables (such as one-to-many or many-to-many), and implementing primary and foreign keys to maintain data consistency.
- To understand different data types (such as text, number, date, and boolean) and their appropriate applications in defining database fields, ensuring proper data storage and retrieval.
- To collect and input data into both flat file and relational databases, demonstrating accuracy in data entry and the ability to organize and manage data effectively.
- To explore real-world uses of databases, analyzing case studies or examples from various industries (such as healthcare, finance, or retail) to understand how databases support operational and strategic decision-making.
- To manipulate database data using various querying techniques (e.g., SQL queries) to retrieve, filter, sort, update, and delete records, demonstrating proficiency in data management and analysis.
- To analyze the advantages and limitations of flat file versus relational database structures, evaluating how each approach impacts data organization, scalability, and efficiency based on practical use cases.

### Term 3

#### Unit 1: Search and Sort Algorithms

Approximate length: 3 weeks

During this unit students will be learning several key skills relating to search and sort algorithms. They will start by learning what algorithms are, along with how they are produced, before going on to learn about the concept of abstraction. Students will then find out how linear and binary searches are performed on a set of data. Students will progress to learning about the key sorting methods: bubble and merge. Students will learn how to create and code sorting methods and will then produce a project that will include working out which method is the most efficient. Students develop the skills required to fix their algorithms.

Specific National Curriculum Objectives Covered:

- To understand the concept of algorithms, including how they are created and used to solve problems by defining step-by-step procedures.
- To learn about the concept of abstraction in algorithms, focusing on simplifying complex problems by breaking them down into more manageable parts.
- To perform linear and binary search algorithms on datasets, understanding their processes and efficiency for locating elements in an array or list.

#### Unit 2: Sound and Storage

Approximate length: 3 weeks

Students explore how sound is digitised and stored (including file sizes). File sizes leads to researching different types of storage devices and media, researching the needs of users/organisations and making recommendations for user needs.

Specific National Curriculum Objectives Covered:

- To understand the process of digitizing sound, including how analog audio signals are converted into digital data through sampling and quantization.
- To explain how different factors (such as sample rate and bit depth) affect the quality and file size of digital audio recordings.
- To research and compare various types of storage devices and media (e.g., hard drives, SSDs, cloud storage) in terms of their capacity, speed, and suitability for storing audio files.
- To analyze the storage needs of different users and organizations based on their audio data requirements, including considerations for file size, accessibility, and data security.
- To make informed recommendations for appropriate storage solutions tailored to specific user needs or organizational requirements, considering factors such as budget, scalability, and performance.

### Unit 3: Input, Process, Output

Approximate length: 3 weeks

This unit is about what happens behind the screen on a computer (or device). Students will look at the components inside a computer and the way the CPU works with other components. They will review different memory types and how they affect computer performance.

#### Specific National Curriculum Objectives Covered:

- To identify and describe the major internal components of a computer, including the CPU, motherboard, RAM, hard drive, and power supply.
- To understand the function and role of the CPU (Central Processing Unit) in a computer system, including how it processes instructions and interacts with other components.
- To review different types of memory, such as RAM (Random Access Memory), and ROM.
- To compare and contrast volatile and non-volatile memory, understanding the differences between temporary storage (like RAM) and permanent storage (like SSDs and HDDs).
- To investigate the role of input and output devices in a computer system and how they interface with internal components to enable user interaction and data processing.
- To examine common performance issues related to hardware, such as bottlenecks and thermal throttling, and how they affect overall system efficiency.
- To discuss advancements in computer hardware technology, including emerging trends in CPUs, memory, and storage solutions, and their potential impact on future computer performance.

### Assessment

**Formative:** Throughout the chapters, the students will complete graded work, quizzes, and differentiated activities, which allows the teacher to assess the student's attainment and inform their planning.

For each chapter the students complete a pre and post quiz. This allows us to see progress across the units.

**Summative:** At the end of each term, students will complete internal and standardized tests. This allows us to measure the students' progress throughout the term and year. At the end of the academic year, the

students complete a closed book style exam to test both practical and theoretical knowledge. Mini projects and assignments will also be used to show the development of skills that are cross-curricular.

**Online assessment:** One-to-one questioning and group questioning will be carried out. Online quizzes will be carried out using Microsoft forms. Students will also be asked to create different projects using a range of software.