Year 9 Computing Map

Unit 9.1	Cracking the code	Strands
Topic		
	By the end of this session: **All** students should understand that encryption is a way of keeping data secure from unauthorised users, and that data can be encrypted and decrypted using cyphers. **Most** will be able to identify common features about different cyphers used throughout history, and know that without the key to decrypt cypher text we cannot convert it back into plaintext. **Some** will be able to explain the mathematical principles behind some of the major cyphers in history. This session is about understanding and developing students' own cyphers. By the end of it: **All** students will be able to use a simple cypher to convert plain text to cypher text and back again. **Most** students will develop a more complex cypher using a substitution or transposition method. **Some** will develop a range of cyphers using a variety of methods. Leading on from the previous session, students will be creating a spreadsheet to encrypt and decrypt data using one or more of the cyphers they designed during the last lesson. By the end: **All** students will be able to create a spreadsheet for a simple substitution cypher. **Most** will be able to create spreadsheets that will carry out substitution and transposition cyphers. **Some** will create spreadsheets for complex cyphers. Lessons 5 and 6 require students to write a program in a text-based programming language, using new techniques. By the end: **All** students will have created a simple cypher. **Most** will create a cypher using a text-based programming language. **Some** will create a *complex* cypher using a text-based programming language.	Data and data representation Information technology

Unit 9.2	Representing sounds	Strands
Topic		
This unit explores the way that computers store and execute binary information, including sound.	This unit covers the NC bullet: 'Understand how instructions are stored and executed within a computer system; understand how data of various types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits.' First session introduces 'sampling' and streaming. By the end of the session: **All** students will understand about uncompressed file size and that a bigger file takes longer to download. **Most** will understand that a sound file can be displayed as a graph. **Some** will know different media formats and understand their typical file sizes. In this session students will be finding out more about how sounds are captured and stored as binary data. By the end: **All** students must understand that sounds are stored as individual samples; and will know that having more samples means a better quality sound. **Most** will understand that an increased number of samples leads to more accurate sound reproduction; and will know that more samples lead to a bigger overall file size. **Some** will understand the connection between streaming, downloading and file quality. Lossy and lossless compression. By the end of it: **All** students should know that there are different formats for sound files; understand that reducing the file size will often affect sound quality; and understand the difference between lossy and lossless data compression. **Some** students will know that lossless compression techniques don't affect sound quality; and understand that lossless compression does not reduce the file size as much as lossy compression. **Some** will even be able to confidently evaluate the advantages of lossless and lossy compression.	Information technology Data and data representation

Unit 9.3	Simple Databases	Strands
Topic		
This unit is designed to provide students with an understanding of what is involved in building a database.	This unit covers the NC bullets: 'Undertake creative projects 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.' 'Understand simple Boolean logic (such as AND, OR and NOT) and some of its uses in circuits and programming.' 'Use two or more programming languages, at least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures such as lists, tables or arrays; design and develop modular programs that use procedures or functions.' Re-introduction of the structure and purpose of databases. By the end of the session: **All** students should be able to explain the terms 'table', 'record' and 'field'; select relevant data for storing in a database; and create a table of data. **Most** will be able to explain the term 'key field'; extract relevant data from passages of text; and select the correct data type for a field. **Some** may be able to import data from a spreadsheet into a database. Boolean operators. By the end of the session: **All** students should be able to use the Boolean operators AND, OR, NOT and wildcard operators; and be able to construct simple database queries using the database query wizard. **Most** students will be able to explain how the Boolean AND, OR, NOT and wildcard operators work; construct database queries using a combination of Boolean operators, using the database query wizard; and search a database efficiently. **Some** will be able to construct complex database queries using SQL. Entering and checking data, then querying it to find the results you want. At the end of this session: **All** students will be able to construct simple database queries to find answers to specific questions using the database query wizard; they will also understand the concept of data redundancy and how to reduce it. **Most** students will be able to construct a series of database queries to find answers to specific questions using Boolean operators and the database query wizard. **Some** may be able to construct complex database queries to find answers to specific questions using SQL..	Programming and development Information Technology Data and data representation