Subject: Computing/ICT

Year	Step	Grade	**Computing:** Key knowledge	**Computing:** Key Skills	**ICT:** Key knowledge & skills
End of Year 7	Step 1	1	*You should be able to recall basic information about computers. For example input & output devices. *You can remember one of the 3 contructs of programming (sequencing, selection & loops). *You know binary numbers can be 1 or 0.	*You should be able to create basic programs in code.org, Small Basic and Kodu using help and guidance. *You should be able to enter data into a spreadsheet and change some aspects of formatting.	*You should be able to recall basic information about e-safety. *You can produce an ICT product that follows some of the criteria given. The information provided may not be accurate and include some spelling or grammatical errors, which reduce the effectiveness of the product.
		2	*You should be able to recall several basic pieces of information about computers. *You can remember the 3 constructs of programming (sequencing, selection & loops). *You can describe at least one key principle from a topic. *You can calculate 4 bit numbers (nibble) into denary numbers & denary numbers into binary.	*You should be able to plan a solution to a programming problem and create a working program to solve the problem. You should be able to create programs in code.org, Small Basic and Kodu effectively using the plan. *You should be able to enter, edit and manipulate date in a spreadsheet by using basic mathematical formula.	*You should be able to recall some information and gather additional content through basic research about e-safety. *You can produce an ICT product that follows most of the criteria given. The information provided will be mostly accurate with few spelling or grammatical errors.
		3	*You should be able to recall several pieces of information about computers confidently, providing some examples. *You can describe the 3 constructs of programming (sequencing, selection & loops). *You are able to explain in detail at least one key principle from the topics (E.G. Identity theft and why computers store data as binary). *You can calculate 8 bit numbers (byte) into denary numbers & denary numbers into binary.	*You should have developed your code.org, Small Basic and Kodu programming skills to be able to plan and create a working program to solve a problem. You will have begun to use and understand the importance of selection statements and loops in your programs. *You are able to effectively use a spreadsheet to enter, format and manipulate data. This includes the use of mathematical formula and graphical representation.	*You should be able to recall most information and gather additional content through good research about e-safety. *You can produce an ICT product that follows all of the criteria given. The information provided will be accurate with no spelling or grammatical errors, the product will be effective for the audience.
		4	*You should be able to recall most key information abouyt computers, using key terminology and well chosen examples. *You can explain the 3 constructs of programming (sequencing, selection & loops), providing an example of each. *You can calculate 8 bit numbers (byte) into denary numbers & denary numbers into binary and independently learn binary addition.	*You should have developed your code.org, Small Basic and Kodu programming skills to be able to plan and create a working program to solve a problem. You may be able to effectively use selection statements and loops in your programs. *You are able to effectively use a spreadsheet to enter, format and manipulate data. This includes the use of mathematical formula and graphical representation	*You should be able to recall information and key terminology used, and gather additional content through well structured research about e-safety. *You can produce an ICT product that follows all of the criteria given. The information provided will be accurate with no spelling or grammatical errors, the product will be highly effective for the audience, with use of appropriate language and design decisions.
End of Year 8	Step 2	2	You should be able to recall several basic pieces of information about HTML, games authoring, visual coding & graphics. You can describe in detail at least one point from HTML, games authoring, visual coding & graphics.	*You should be able to plan a solution to a programming problem and create a working program to solve the problem. You should be able to create programs in Gamemaker effectively using the plan. *You should be able to debug errors in your programs with some support. *You should be able design a basic webpage in html using basic tags.	*You should be able to recall several basic pieces of information about digital citizenship, HTML and graphical types. *You can produce an ICT product that starts to consider the audience through the design and written text. Colours may not be well selected and reduce the effectiveness of the product.
		3	You should be able to recall several pieces of information about more than two aspects about HTML, games authoring, visual coding & graphics. You are able to describe at least one key principle from the topics (E.G. Why HTML was developed as a standard for web pages and how pixels make up images).	*You should have developed your Gamemaker and visual programming skills to be able to plan and create a working program to solve a problem. You will have begun to use and understand the importance of sequencing, selection statements and loops in your programs. *You should be able to debug some errors in your programs independently. *You should be able design a webpage in html using tags (basics, href and images).	*You should be able to recall several information about more than two aspects about digital citizenship, HTML and graphical types & techniques with basic examples. *You can produce an ICT product that has some consideration for the audience & the purpose, through design and written text. Colours are mostly effective of the product and make the product more readable.
		4	You should be able to recall most key information about HTML, games authoring, visual coding & graphics. You should be able to explain in detail various key principles studied. (E.G. The difference between bitmap and vector images.)	*You should have independently develop your Gamemaker and visual programming skills to be able to plan and create a working program to solve a problem. You may be able to effectively use sequencing, selection statements and loops in your programs. *You should be able to debug most errors in your programs independently. *You should be able design a webpage in html using a range of tags combining them where appropriate. *You should be able to produce control solutions for problems that include subroutines.	*You should be able to recall most key information about digital citizenship, HTML, and graphical types & techniques using key terminology effectively, explaining with examples. *You can produce an ICT product that mostly considers the audience & the purpose, through design, suitable images and written text. Colours are effective and text is clear to read and provides some impact.
		5	You should be able to recall all key information about HTML, games authoring, visual coding & graphics. You should be able to explain and begin analysing various key principles studied (E.G. binary data representation in an image.)	*You should have independently developed your Gamemaker and visual programming skills to be able to plan and create a working program to solve a problem. You may be able to effectively use selection statements, loops, variables and Boolean operators in your programs. *You should be able to prevent errors in your programs by debugging each line as you build your program. *You should be able design an effective webpage in html using a range of tags combining them where appropriate. You will have considered the design and use of CSS in your html webpage.	*You should be able to recall most key information about digital citizenship, HTML, and graphical types & techniques using key terminology effectively, and justifying decisions with examples. *You can produce an ICT product that effectively considers the audience & the purpose, through design, the use of white space, consistent images and well tailored written text. Colours have impact and are used to emphasise the intended message for the product.

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Year	Step	Grade	**Computing:** Key knowledge	**Computing:** Key Skills	**ICT:** Key knowledge & skills
End of Year 9	Step 3	3	You should be able to recall several pieces of information about more than two aspects about computers, data representation, algorithms & programming concepts. You are able to describe at least one key principle from the topics. (E.G. the 3 factors effecting the performance of a CPU).	*You should have developed your algorithm & Python programming skills to be able to plan and create a working program to solve a problem. You will have begun to use and understand the importance of selection statements and loops in your programs. *You understand some of the flow chart shapes that can be used to display an algorithm.	*You should be able to recall several pieces of information about more than two aspects about digital citizenship, spreadsheets and web design. *You can produce an ICT product but require some support in the use of the application in achieving some of the stated criteria.
		4	You should be able to recall most key information about computers, data representation, algorithms & programming concepts, use key terminology effectively. You should be able to explain various key principles studied. (E.G the function of CPU & RAM.)	*You should have developed your algorithm & Python programming skills to be able to plan and create a working program to solve a problem. You may be able to effectively use selection statements and loops in your programs. *You can build a simple flow chart for a real life problem, that has a logical flow and broken down into sensible steps.	*You should be able to recall several pieces of information about more than two aspects about digital citizenship, spreadsheets and web design, use key terminology effectively. *You can produce an ICT product with limited support that achieves most of the stated criteria which is mostly effective for the intended audience.
		5	You should be able to recall all key information about computers, data representation, algorithms & programming concepts, using some key terminology effectively. You should be able to explain in detail various key principles studied, with some minor technical errors or misconceptions. (E.G. The process of the Fetch-Decode-Execute cycle of the CPU)	* You can write more complex algorithms and break problems down but sometimes requires assistance. * You should have developed your Python programming skills to be able to plan and create a working program to solve a problem. You may be able to effectively use: - selection statements - loops - variables - Boolean operators. *You can build an accurate flow chart for a real life problem, that incorporates decisions and selection.	*You should be able to recall more detailed pieces of information about many aspects of digital citizenship, spreadsheets and web design, using key terminology effectively. Independently researching and drawing some conclusions. *You can produce an ICT product independently and achieves most of the stated criteria which is effective for the intended audience.
		6	You should be able to recall all key information about computers, data representation, algorithms & programming concepts, frequently using key terminology effectively. You should be able to explain and analyse various key principles studied, including the more complex areas, with confidence and no errors. (E.G. The role of the Porgram Counterm MDR, MAR, CIS, ALU & Accumilator in the Fetch-Decode-Execute cycle of the CPU)	* You should be able to analyse and break down problems creating a complex algorithms, with limited assistance. * You should have developed your Python programming skills to be able to plan and create a working program to solve a problem. You may be able to effectively use: -selection statements - loops - variables - Boolean operators - basic arrays. *You can build an accurate flow chart for a real life problem, that incorporates decisions and selection. The flow chart will take into consideration variable names and how these will be used in the input, process and output phases of intended program.	*You should be able to recall detailed pieces of information about many aspects of digital citizenship, spreadsheets and web design, using key terminology effectively. Independently researching and drawing accurate conclusions. *You can produce an ICT product independently that achieves all of the stated criteria which is highly effective for the intended audience and includes some more advanced features of the software.

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Year	Step	Grade	**Computing:** Key knowledge	**Computing:** Key Skills	**ICT:** Key knowledge & skills
End of Year 10	Step 4	3	You should be able to recall several basic pieces of information about the topics studied (System Architecture, Memory, Storage, Binary, System Software, Networks, Protocols and topologies Data Representation and translators/facilities.) You are able to explain in detail at least one key principle from the topics.	*You should have developed your Python programming skills to be able to plan and create a working program to solve a problem. You will have begun to use and understand the importance of selection statements and loops in your programs.	*You should be able to recall several basic pieces of information about the topics studied (web design, animation, movie production & sound editing.) *You can produce an ICT product based on a project brief that achieves some of the stated criteria, there may be some technical issues that limits the effectiveness of the product.
		4	You should be able to recall most key information about the topics studied (System Architecture, Memory, Storage, Binary, System Software, Networks, Protocols and topologies Data Representation and translators/facilities.) You should be able to explain in detail various key principles studied.	*You should have developed your Python programming skills to be able to plan and create a working program to solve a problem. You may be able to effectively use selection statements and loops in your programs.	*You should be able to recall most key information about the topics studied (web design, animation, movie production & sound editing). *You can plan & produce an ICT product based on a project brief that achieves most of the stated criteria, you are aware of the audience and your plans are used to build your product. There may be some changes from your plans that have not been recorded, and the product works, with some minor errors. The product is mostly effective.
		5	You should be able to recall all key information about the topics studied (System Architecture, Memory, Storage, Binary, System Software, Networks, Protocols and topologies Data Representation and translators/facilities.) You should be able to explain and begin analysing various key principles studied.	* You can write more complex algorithms and break problems down but sometimes requires assistance. * You should have developed your Python programming skills to be able to plan and create a working program to solve a problem. You may be able to effectively use: - selection statements - loops - variables - Boolean operators.	*You should be able to recall all key information about the topics studied (web design, animation, movie production & sound editing). *You can plan & produce an ICT product based on a project brief that achieves all of the stated criteria, you are aware of the audience and your plans are used to build your product. The plans accurately reflect the final product, that is error free and effective.
		6	You should be able to recall all key information the topics studied. (System Architecture, Memory, Storage, Binary, System Software, Networks, Protocols and topologies Data Representation and translators/facilities.) You should be able to explain and analysing various key principles studied, including consideration of benefits and limitations.	* You should be able to analyse and break down problems creating a complex algorithms, with limited assistance. * You should have developed your Python programming skills to be able to plan and create a working program to solve a problem. You may be able to effectively use: -selection statements - loops - variables - Boolean operators - basic arrays.	*You should be able to recall all key information the topics studied. (web design, animation, movie production & sound editing). *You can plan & produce an ICT product based on a project brief that achieves all of the stated criteria, you are aware of the audience & purpose of the product, and detailed plans are used. There is some justification of design decisions as well as feedback, which has been used throughout the development of your product. The product is effective and is consistent in style.
		7	You show detailed knowledge of all the areas of study and the key principles within them. (System Architecture, Memory, Storage, Binary, System Software, Networks, Protocols and topologies Data Representation and translators/facilities.) You should be able to explain, analysing and evaluate various key principles studied, including consideration of benefits and limitations.	* You should be able to analyse and break down problems creating a complex algorithms, with limited assistance. * You should have developed your Python programming skills to be able to plan and create a working program to solve a problem. You may be able to effectively use: -selection statements (including nested statements) - loops - variables - Boolean operators - multi dimensional arrays. - Parameter passing - Casting	*You show detailed knowledge of all the areas of study and the key principles within them. (web design, animation, movie production & sound editing). *You can independently plan & produce an ICT product based on a project brief that achieves all of the stated criteria, you are aware of the audience & purpose of the product, and detailed plans are used. There is some justification of design decisions as well as feedback, which has been used throughout the development cycle of your product. There is clear indication of how feedback has impacted the effectiveness of the finished product. The product has a clear house style and benefits from more advanced software techniques.

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Year	Step	Grade	**Computing:** Key knowledge	**Computing:** Key Skills	**ICT:** Key knowledge & skills
End of Year 11	**Step 5**	3	You should be able to recall several basic pieces of information about the topics studied (System Architecture, Memory, Storage, Binary, System Software, Networks, Protocols and topologies Data Representation, translators/facilities, issues and security .) You are able to explain in detail at least one key principle from the topics.	*You should have developed your Python programming skills to be able to plan and create a working program to solve a problem. You will have begun to use and understand the importance of selection statements and loops in your programs.	*You should be able to recall several basic pieces of information about the topics studied (web design, animation, movie production, sound editing). *You can produce an ICT product based on a project brief that achieves some of the stated criteria, there may be some technical issues that limits the effectiveness of the product. You are able to write a basic review with some help and structure provided.
		4	You should be able to recall most key information about the topics studied (System Architecture, Memory, Storage, Binary, System Software, Networks, Protocols and topologies Data Representation, translators/facilities, issues and security .) You should be able to explain in detail various key principles studied.	*You should have developed your Python programming skills to be able to plan and create a working program to solve a problem. You may be able to effectively use selection statements and loops in your programs.	*You should be able to recall most key information about the topics studied (web design, animation, movie production, sound editing). *You can plan & produce an ICT product based on a project brief that achieves most of the stated criteria, you are aware of the audience and your plans are used to build your product. There may be some changes from your plans that have not been recorded, and the product works, with some minor errors. The product is mostly effective. You are able to write a review, but identify limited opportunities for improvements that lack any detail.
		5	You should be able to recall all key information about the topics studied (System Architecture, Memory, Storage, Binary, System Software, Networks, Protocols and topologies Data Representation, translators/facilities, issues and security .) You should be able to explain and begin analysing various key principles studied.	* You can write more complex algorithms and break problems down but sometimes requires assistance. You should be able to do this in flowchart form. * You should have developed your Python programming skills to be able to plan and create a working program to solve a problem. You may be able to effectively use: - selection statements - loops - variables - Boolean operators.	*You should be able to recall all key information about the topics studied (web design, animation, movie production, sound editing). *You can plan & produce an ICT product based on a project brief that achieves almost all of the stated criteria, you are aware of the audience and your plans are used to build your product. The plans mostly reflect the final product, that is error free and somewhat effective. You are able to write a review, but identify limited opportunities for improvements with some detail.
		6	You should be able to recall all key information the topics studied. (System Architecture, Memory, Storage, Binary, System Software, Networks, Protocols and topologies Data Representation, translators/facilities, issues and security .) You should be able to explain and analysing various key principles studied, including consideration of benefits and limitations.	* You should be able to analyse and break down problems creating a complex algorithms, with limited assistance. You should be able to do this in both flowcharts and, maybe, pseudocode. * You should have developed your Python programming skills to be able to plan and create a working program to solve a problem. You may be able to effectively use: -selection statements - loops - variables - Boolean operators - basic arrays.	You should be able to recall all key information the topics studied. (web design, animation, movie production, sound editing). *You can plan & produce an ICT product based on a project brief that achieves all of the stated criteria, you are aware of the audience and your plans are used to build your product. The plans accurately reflect the final product, that is error free and mostly effective. You are able to write a good review, but identify opportunities for improvements with good detail.
		7	You show detailed knowledge of all the areas of study and the key principles within them. (System Architecture, Memory, Storage, Binary, System Software, Networks, Protocols and topologies Data Representation, translators/facilities, issues and security .) You should be able to explain, analysing and evaluate various key principles studied, including consideration of benefits and limitations.	* You should be able to analyse and break down problems creating a complex algorithms, with limited assistance. You should be able to do this in both flowcharts and pseudocode. * You should have developed your Python programming skills to be able to plan and create a working program to solve a problem. You may be able to effectively use: -selection statements (including nested statements) - loops - variables - Boolean operators - multi dimensional arrays. - Parameter passing - Casting	*You show detailed knowledge of all the areas of study and the key principles within them. (web design, animation, movie production, sound editing). *You can plan & produce an ICT product based on a project brief that achieves all of the stated criteria, you are aware of the audience and your plans are used to build your product. Feedback is used, and there is some evidence of this being used to improve the final product. The plans accurately reflect the final product, that is error free and effective. You are able to write a well structured review, and clearly identify many opportunities for improvements, using specific examples.
		8	You show very detailed knowledge of all the areas of study and the key principles within them. (System Architecture, Memory, Storage, Binary, System Software, Networks, Protocols and topologies Data Representation, translators/facilities, issues and security .) You should be able to explain, analysing and evaluate various key principles studied, including consideration of benefits and limitations. Your answers include all the correct key areas and sub areas to draw conclusions where needed.	* You should be able to analyse and break down problems creating a complex algorithms both in flowchart and pseudocode. * You should have developed your Python programming skills to be able to plan and create a working program to solve a problem. You may be able to effectively use: -selection statements (including nested statements) - loops - variables - Boolean operators - multi dimensional arrays. - Parameter passing - Casting - MOD/DIV - Exponential to solve problems	*You show very detailed knowledge of all the areas of study and the key principles within them. (web design, animation, movie production, sound editing). *You can plan & produce an ICT product based on a project brief that clearly achieves all of the stated criteria. You are evidence how your product takes into consideration the audience & purpose of the product and detailed plans are used. Some advanced software features have been used. There is justification of design decisions as well as feedback, which has been used throughout the development of your product. The product is effective and is consistent in style. You are able to write a well structured review, and clearly identify many opportunities for improvements, using specific examples and some technical terminology.
		9	**All areas are perfected with 90%+ knowledge and application.** You show very detailed knowledge of all the areas of study and the key principles within them. (System Architecture, Memory, Storage, Binary, System Software, Networks, Protocols and topologies Data Representation, translators/facilities, issues and security .) You should be able to explain, analysing and evaluate various key principles studied, including consideration of benefits and limitations. Your answers include all the correct key areas and sub areas to draw conclusions where needed.	* You should be able to analyse and break down problems creating a complex algorithms both in flowchart and pseudocode. * You should have developed your Python programming skills to be able to plan and create a working program to solve a problem. You are able to use a vast range of programming techniques to complete and go beyond the problem at hand.	**All areas are perfected with 90%+ knowledge and application.** You show very detailed knowledge of all the areas of study and the key principles within them. (web design, animation, movie production, sound editing). *You can independently plan & produce an ICT product based on a project brief that achieves all of the stated criteria, you are aware of the audience & purpose of the product, and detailed plans are used. There is strong justification of design decisions, as well as feedback, which has been used throughout the development cycle of your product. There is clear indication of how feedback has impacted the effectiveness of the finished product. The product has a clear house style and benefits from more advanced software techniques. You are independently able to write a well structured review, evaluating, the strengths and weaknesses of the finished product & opportunities for improvements, using specific examples, referencing technical improvements, complete with correct terminology.