

Rivers Academy Age Related Expectations - Computing

Year 7	Year 8	Year 9	Year 10	Year 11
<p>CS-Programming essentials in Scratch – How can we develop a story using the programming language Scratch?</p> <p>-Compare how humans and computers understand instructions (understand and carry out)</p> <p>- Define a sequence as instructions performed in order, with each executed in turn</p> <p>- Modify a sequence</p> <p>- Predict the outcome of a simple sequence</p> <p>-Define a variable as a name that refers to data being stored by the computer</p> <p>- Make a sequence that includes a variable</p> <p>- Predict the outcome of a simple sequence that includes variables</p> <p>- Recognise that computers follow the control flow of input/process/output</p> <p>- Trace the values of variables within a sequence</p>	<p>CS -Gameplay Mechanics- How can we create video game?</p> <p>-identify different game mechanics</p> <p>-effectively communicate game mechanics and how they work</p> <p>-explain the importance of correct instructions</p> <p>-understand what algorithms are</p> <p>-Create and debug simple programs</p> <p>-Recognise common uses of information technology beyond school</p> <p>-Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when</p>	<p><u>Python Programming</u></p> <ul style="list-style-type: none"> ● Can program a basic procedure ● Can use input() function ● Can identify the different mathematical operators in Python ● Can evaluate expressions in Python ● Can use IF statement correctly ● Can customise a program to use a combination of IF, PRINT and variables as an increment count ● Can debug a code based on error type ● Can name the different types of errors and explain each of them ● Can write a program using nested IF statements 	<p><u>Paper 1</u></p> <p>Can clearly describe the purpose of the CPU and Von Neumann architecture</p> <p>Can describe the importance of different registers</p> <p>Can describe the functions of ALU,CU & cache memory</p> <p>Can explain the function of CPU and the role it plays in FDE cycle</p> <p>Can explain the purpose of embedded systems</p> <p>Can explain why computers need virtual memory</p> <p><u>Paper 2</u></p> <p>Can demonstrate computational thinking skills</p> <p>Can interpret, correct or complete algorithms</p> <p>Can use variables, constants, operators, inputs, outputs and assignments whilst programming</p> <p>Can use data types appropriately including:integer, real, string, boolean</p> <p>Can use sequence, selection, iterations to control the flow of a program</p> <p>Can make appropriate use of data structures</p> <p>Can use subprograms effectively to produce structured code</p> <p>Can use standard searching and sorting algorithm :binary search, linear search, bubble sort, merge sort, insertion sort</p> <p>Can effectively apply maintainability of</p>	<p><u>Paper 1</u></p> <p>Can explain the difference between RAM & ROM</p> <p>Can explain the need for virtual memory</p> <p>Can explain the different types of storage devices and their purposes</p> <p>Can evaluate the benefits of different forms of secondary storage</p> <p>Can explain the different types of networks LAN, WAN, Client server, peer to peer</p> <p>Can draw star and mesh network</p> <p>Can outline the different protocols</p> <p>Can evaluate the factors that affect the performance of networks</p> <p>Can explain the hardware needed to connect to a network</p> <p>Can explain the concept of virtual networks</p> <p>Can confidently describe network topologies</p> <p>Can explain the different protocols and describe packet switching and layers</p> <p>Have a comprehensive understanding of a range of threats posed to networks and can identify and outline how to prevent vulnerabilities</p> <p>Can describe the purpose and functionality of systems software</p> <p>Can describe the different sections of an operating system</p> <p>Can explain the purpose of utility software with examples</p> <p>Can outline different threats posed to a network and state how these can be prevented</p>

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<p>-Define a condition as an expression that will be evaluated as either true or false</p> <ul style="list-style-type: none"> - Identify that selection uses conditions to control the flow of a sequence - Identify where selection statements can be used in a program - Modify a program to include selection <p>-Create conditions that use comparison operators (>,<=)</p> <ul style="list-style-type: none"> - Create conditions that use logic operators (and/or/not) - Identify where selection statements can be used in a program that include comparison and logical operators <p>-Define iteration as a group of instructions that are repeatedly executed</p> <ul style="list-style-type: none"> - Describe the need for iteration - Detect and correct errors in a program (debugging) - Identify where count-controlled iteration can 	<p>they have concerns</p> <ul style="list-style-type: none"> -understand simple Boolean logic AND,OR and NOT. -Undertake creative projects involving selecting, combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting needs of known users -develop and apply their analytic, problem-solving, design and computational thinking skills <p>Link to National curriculum</p> <ul style="list-style-type: none"> ● Use two or more programming languages to solve a variety of computational problems ● Use of data structures ● Develop modular programs that use procedures and 	<ul style="list-style-type: none"> ● Can evaluate my code and make improvements <p>Link to KS3 National Curriculum:</p> <ul style="list-style-type: none"> ● Use two or more programming languages to solve a variety of computational problems ● Use of data structures ● Develop modular programs that use Procedures and Functions ● Develop and apply their analytical, problem-solving, design and computational skills <p>Computer crime and crime prevention</p> <ul style="list-style-type: none"> ● Understand the impact of social 	<p>code to all programs created</p> <p>Can carry out different types of testing: iterative, final</p> <p>Can select suitable test data</p> <p>Can apply SQL to search for data</p> <p>Can create logic diagrams and truth tables for given scenarios</p> <p>Can list the different generations of programming languages and explain their differences</p> <p>Can explain the difference between compiler and interpreter</p> <p>Link to KS4 National Curriculum:</p> <ul style="list-style-type: none"> ● Develop their capability, creativity and knowledge in computer science, digital media and information. ● Develop and apply their analytic, problem-solving, design, and computational thinking skills ● Understand how changes in technology affect safety, including new ways to protect their online privacy and identity, and how to identify and report a range of concerns. 	<p>Can apply some knowledge on legal, ethical, cultural and environmental issues relevant to computers</p> <p>Can convert binary to denary and vice versa</p> <p>Can do hexadecimal conversion</p> <p>Can add binary numbers and can also to left and right shifts</p> <p>Can explain the difference between lossy and lossless compression</p> <p>Link to KS4 National Curriculum:</p> <ul style="list-style-type: none"> ● Develop their capability, creativity and knowledge in computer science, digital media and information. ● Develop and apply their analytic, problem-solving, design, and computational thinking skills ● Understand how changes in technology affect safety, including new ways to protect their online privacy and identity, and how to identify and report a range of concerns.
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<p>be used in a program - Implement count-controlled iteration in a program</p> <p>-Independently design and apply programming constructs to solve a problem (subroutine, selection, count-controlled iteration, operators, and variables)</p> <p>Link to KS3 National Curriculum:</p> <ul style="list-style-type: none"> ● Use two or more programming languages to solve a variety of computational problems ● Use of data structures ● Develop modular programs that use Procedures and Functions ● Develop and apply their analytical, problem-solving, design and 	<p>functions</p> <ul style="list-style-type: none"> ● Develop and apply their analytical, problem-solving, design and computational skills ● Understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct, and know how to report concerns <p>Digital Literature</p> <ul style="list-style-type: none"> ● Choose search terms relating to a particular issue Identify key features of a good poster Use tools to copy an image into another application ● Choose and download a suitable image 	<p>media on our lives</p> <ul style="list-style-type: none"> ● Understand phishing, Malware and other viruses ● Understand cyberbullying ● Understand how to be safe online <p>Link to KS3 National Curriculum:</p> <ul style="list-style-type: none"> ● Understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct, and know how to report concerns 		
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<p>computational skills</p>	<p>Create a poster using a desktop publishing application</p> <p>Plan a poster to clearly convey a message</p> <ul style="list-style-type: none">● Choose how to combine text and graphics in a slide<ul style="list-style-type: none">- Modify a logo using a graphic editing program- Use digital tools to provide feedback on design choices● Modify a logo so that it fits in with the planned slide styles● Plan a consistent layout for a set of slides● Create a styled set of slides based on a plan● Evaluate your work against a rubric● Explain your work to others through a presentation● Plan how to deliver			
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a presentation

Link to KS3 National Curriculum:

- 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
- Create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design and usability.

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<p>Digital Literature</p> <ul style="list-style-type: none">• Choose search terms relating to a particular issue Identify key features of a good poster Use tools to copy an image into another application• Choose and download a suitable image Create a poster using a desktop publishing application Plan a poster to clearly convey a message• Choose how to combine text and graphics in a slide Modify a logo using a graphic editing program Use digital tools to provide feedback on design choices• Modify a logo so that it fits in with the planned slide styles Plan a consistent layout for a set of		<p><u>Spreadsheet software</u></p> <ul style="list-style-type: none">• Can enter data onto a spreadsheet• Can identify cell references correctly• Can use AutoFill to enter data• Can use brackets to change order of calculation• Can use conditional formatting to a spreadsheet• Can use advanced functions such as COUNTA• Can sort data by criteria• Can create simple bar chart, pie chart including suitable data labels <p>Link to KS3 National Curriculum:</p> <ul style="list-style-type: none">• Undertake creative projects that involve selecting, using and combining multiple		
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<p>slides</p> <p>Create a styled set of slides based on a plan</p> <ul style="list-style-type: none">● Evaluate your work against a rubric <p>Explain your work to others through a presentation</p> <p>Plan how to deliver a presentation</p> <p>Link to KS3 National Curriculum:</p> <ul style="list-style-type: none">● 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● Create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design and usability.		<p>applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users</p>		
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