

Year Group: 4	Term: Spring 1 & 2	Topic: Computing Science
NC Links		
<ul style="list-style-type: none"> • Design and write programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. • Use sequence, selections and repetition in programs; work with variables and various forms of input and output; generate appropriate inputs and predicted outputs to test programs. • Use logical reasoning to explain how a simple algorithm works, detect and correct errors in algorithms and programs. 		
Other Curriculum Links		
Literacy - instructional writing (sandwich bot), Science, PE (Unplugged activities)		
Topic Overview		
<p>Children will further understanding of computing science by using knowledge of algorithms and programming by using a range of activities and applications. Topic will begin by revisiting 'unplugged' activities using CS Unplugged, to support children's understanding of computing science and the vocabulary behind it (use knowledge organisers to help explain concepts and vocabulary). Children will then progress onto the next stage of Code.org (Unit D). Class teachers can also use school ipads as an additional activity or exploration lesson.</p>		
Links to Rights Respecting		
<p>Article 17 - Every child has the right to reliable information from the media. This should be information that children can understand. Governments must help protect children from materials that could harm them.</p> <p>Article 28 - Every child has the right to an education. Primary education must be free and different forms of secondary education must be available to every child. Discipline in schools must respect children's dignity and their rights.</p>		
Links to North East Ambition		
<p>Children will look at different careers within computing and how the subject is evolving every day. Teachers can reference jobs/companies that are recognised globally (apple, Microsoft etc.) or locally (Sunderland Nissan, Newcastle University, CAS). Jobs may include: Engineer, Game Designer, Cyber Crime Officer, Photographer, Video Animator, Office Worker etc.</p> <p>GATSBY BENCHMARK 3 GATSBY BENCHMARK 4 GATSBY BENCHMARK 5</p>		
Possible Visits/Visitors		
Saltwell Park maze		
Essential Subject Skills to be covered		

- Use specified screen coordinates to control movement.
- Set the appearance of objects and create sequences of changes.
- Create and edit sounds. Control when they are heard, their volume, duration and rests.
- Control the shade of pens.
- Specify conditions to trigger events.
- Use IF THEN conditions to control events or objects.
- Create conditions for actions by sensing proximity or by waiting for a user input (such as proximity to a specified colour or a line or responses to questions).
- Use variables to store a value.
- Use the functions define, set, change, show and hide to control the variables.

Overall Learning Outcomes

Children will learn about Binary Numbers, Pixels, Sequencing, Events, Loops and Conditionals

Learning Intentions (for use in self assessment at end of topic)

- I can use specified screen coordinates to control movement.
- I can set the appearance of objects and create sequences of changes.
- I can create and edit sounds. Then control when they are heard, their volume, duration and rests.
- I can control the shade of pens.
- I can specify conditions to trigger events.
- I can use IF THEN conditions to control events or objects.
- I can create conditions for actions by sensing proximity or by waiting for a user input (such as proximity to a specified colour or a line or responses to questions).
- I can use variables to store a value.
- I can use the functions define, set, change, show and hide to control the variables.

Year Group: 4	Term: Spring 1 & 2	Topic: Computing Science
Possible Activities		
<ul style="list-style-type: none"> ● CS Unplugged - Binary Numbers p4-12 & Pixels p16-25 ● Code.org - (Unit D) Sequencing, Events, Loops and Conditionals ● Build upon experiences from KS1 and Year 3 through use of '<i>Kodable</i>', '<i>A.L.E.X</i>' and '<i>Scratch Junior</i>' apps. Text ● Use physical devices (Blue Bots) ● Introduction of '<i>Lightbot Jr</i>' app. Goal this time is to no longer just reach the end of the maze. Pupils now must light up each blue square that they land on throughout the maze. ● Experience the link between the physical and the digital through stepping out mazes from '<i>Lightbot Jr</i>' app using either scrap paper or hoops, chalk etc in school hall or playground. ● Pupils to write 'precise' instructions for Sandwich Bot 3000 to create a jam sandwich. Teacher to take on the role of Sandwich Bot and to follow the instructions given by the pupils. Focus for the lesson is on 'precise' and 'unambiguous' instructions. <p>Link to instructional writing (precise instructions). '<i>Sandwich Bot</i>' https://www.youtube.com/watch?v=leBEFaVHlIE</p>		
Suggested Strategies for Recording Learning		
<ul style="list-style-type: none"> ● Code.org ● Ongoing projects recorded on '<i>Kodable</i>', '<i>A.L.E.X</i>' and '<i>Scratch Junior</i>' ● Series of instructions created for physical devices (Blue Bots) or activities (Mazes) ● Series of instructions created for '<i>Lightbot Jr</i>' app ● Instructional writing (precise instructions) for '<i>Sandwich Bot</i>' 		

Year Group: 4	Term: Spring 1 & 2	Topic: Computing Science	
Assessment			
Ongoing assessment from guided activities, observations, discussions, questioning and work evidence. A suggested activity is: <ul style="list-style-type: none"> Code.org will track progress of children 			
	x.1	x.2	x.3
Motion	Beginning to use specified screen coordinates to control movement.	Use specified screen coordinates to control movement.	Use specified screen coordinates to control movement and reflect/edit accordingly.
Looks	Beginning to set the appearance of some objects and create sequences of changes.	Set the appearance of objects and create sequences of changes.	Set the appearance of a wide range of objects and create sequences of changes.
Sound	Create and edit some sounds. Beginning to control when they are heard, their volume, duration and rests.	Create and edit sounds. Control when they are heard, their volume, duration and rests.	Create and edit multiple sounds. Accurately control when they are heard, their volume, duration and rests.
Draw	Starting to control the shade of pens.	Control the shade of pens.	Accurately control the shade of pens to enhance detail/effectiveness.
Events	Specify conditions to trigger some events.	Specify conditions to trigger events.	Specify conditions to trigger multiple events.
Control	Is starting to use IF THEN conditions to control events or objects.	Use IF THEN conditions to control events or objects.	Can accurately and independently use IF THEN conditions to control events or objects.

Sensing	Create conditions for limited actions by sensing proximity or by waiting for a user input (such as proximity to a specified colour or a line or responses to questions).	Create conditions for actions by sensing proximity or by waiting for a user input (such as proximity to a specified colour or a line or responses to questions).	Create conditions for a wide range of actions by sensing proximity or by waiting for a user input (such as proximity to a specified colour or a line or responses to questions).
Variables and lists	Use some variables to store a value.	Use variables to store a value.	Use a range of variables to store a value.
Variables and lists	Can sometimes use the functions define, set, change, show and hide to control the variables.	Use the functions define, set, change, show and hide to control the variables.	Accurately and independently use the functions define, set, change, show and hide to control the variables.