



Progression in Computational Thinking at Pitmaston Primary School

"Computational Thinking is a set of problem solving skills we can learn away from the computer. When children are older they will start to use their Computational Thinking skills to create computer systems that are part of solutions to problems - but not quite in Early Years. We might use online activities now and then to practise some aspects of Computational Thinking skills, but in EYFS we can learn Computational Thinking without computers. This is called an 'unplugged' approach."



EYFS	Nursery Pupils will know how to:	Reception Pupils will know how to:
Logic <i>Anticipating and explaining is logical reasoning</i>	<ul style="list-style-type: none"> Enjoy listening to longer stories and can remember much of what happens. Pay attention to more than one thing at a time, which can be difficult. Use longer sentences of four to six words. Increasingly follow rules, understanding why they are important. Remember rules without needing an adult to remind them. Solve real world mathematical problems with numbers up to 5 Describe a familiar route. Discuss routes and locations, using words like 'in front of' and 'behind'. Follow our Pitmaston Golden Rules Listen with increased attention to sounds. Respond to what they have heard, expressing their thoughts and feelings. 	<ul style="list-style-type: none"> Understand how to listen carefully and why listening is important Use new vocabulary through the day Articulate their ideas and thoughts in well-formed sentences. Connect one idea or action to another using a range of connectives Listen to and talk about selected non-fiction to develop a deep familiarity with new knowledge and vocabulary Follow our Pitmaston Golden Rules Explain the reasons for rules, know right from wrong and try to behave accordingly.
Algorithms and Decomposition <i>Responding to instructions, ordering things, sequencing things, introducing storylines, working out different ways to do things, breaking problems down into steps</i>	<ul style="list-style-type: none"> Understand a question or instruction that has two parts, such as "Get your coat and wait at the door". Understand 'why' questions, like: "Why do you think the caterpillar got so fat?" Know many rhymes, be able to talk about familiar books, and be able to tell a long story Use talk to organise themselves and their play: "Let's go on a bus... you sit there... I'll be the driver." 	<ul style="list-style-type: none"> Retell the story, once they have developed a deep familiarity with the text, some as exact repetition and some in their own words. Draw information from a simple map. Invent, adapt and recount narratives and stories with peers and their teacher. Develop storylines in their pretend play. Return to and build on their previous learning, refining ideas and developing their ability to represent them. Create collaboratively, sharing ideas, resources and skills.
Patterns and Extraction <i>Grouping things, comparing, spotting similarities and differences, working out rules</i>	<ul style="list-style-type: none"> Increasingly able to use and remember sequences and patterns of movements which are related to music and rhythm. Select and use activities and resources, with help when needed. This helps them to achieve a goal they have chosen, or one which is suggested to them. Develop fast recognition of up to 3 objects, without having to count them individually ('subitising'). <ul style="list-style-type: none"> Say one number for each item in order: 1,2,3,4,5 Show 'finger numbers' up to 5 Compare quantities using language: 'more than', 'fewer than' 	<ul style="list-style-type: none"> Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can. Continue, copy and create repeating patterns. Compare length, weight and capacity Explore the composition of numbers to 10. Understand the 'one more than/one less than' relationship between consecutive numbers Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.



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	<ul style="list-style-type: none">Make comparisons between objects relating to size, length, weight and capacity.Extend and create ABAB patterns – stick, leaf, stick, leaf.Notice and correct an error in a repeating pattern.Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then...'	<ul style="list-style-type: none">Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.Compare and contrast characters from stories, including figures from the past.
Abstraction <i>Naming and labelling, working out what is important, sticking to the main theme, ignoring what is not important, creating a summary</i>	<ul style="list-style-type: none">Pay attention to more than one thing at a time, which can be difficult.Engage in extended conversations about stories, learning new vocabulary.Write some or all of their name.Write some letters accurately.Know that there are different countries in the world and talk about the differences they have experienced or seen in photos.	<ul style="list-style-type: none">Learn new vocabularyAsk questions to find out more and to check they understand what has been said to them.Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen.
Tinkering <i>Playing and exploring</i>	<ul style="list-style-type: none">Collaborate with others to manage large items, such as moving a long plank safely, carrying large hollow blocks.Match their developing physical skills to tasks and activities in the setting. For example, they decide whether to crawl, walk or run across a plank, depending on its length and width.Use all their senses in hands-on exploration of natural materials.Explore collections of materials with similar and/or different properties.Talk about what they see, using a wide vocabulary.Explore how things work.Take part in simple pretend play, using an object to represent something else even though they are not similar.Explore colour and colour-mixing.Play instruments with increasing control to express their feelings and ideas.	<ul style="list-style-type: none">Develop their small motor skills so that they can use a range of tools competently, safely and confidently. Suggested tools: pencils for drawing and writing, paintbrushes, scissors, knives, forks and spoonsExplore the natural world around them.Describe what they see, hear and feel whilst outside.Understand the effect of changing seasons on the natural world around them.
Creating <i>Creating, checking and fixing things</i>	<ul style="list-style-type: none">Choose the right resources to carry out their own plan. For example, choosing a spade to enlarge a small hole they dug with a trowel.Experiment with their own symbols and marks as well as numeralsMake imaginative and complex 'small worlds' with blocks and construction kits, such as a city with different buildings and a parkDevelop their own ideas and then decide which materials to use to express them.Join different materials and explore different textures	<ul style="list-style-type: none">Explore, use and refine a variety of artistic effects to express their ideas and feelings.Return to and build on their previous learning, refining ideas and developing their ability to represent them.Create collaboratively, sharing ideas, resources and skills.Listen attentively, move to and talk about music, expressing their feelings and responses.Watch and talk about dance and performance art, expressing their feelings and responses.



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	<ul style="list-style-type: none">• Create closed shapes with continuous lines, and begin to use these shapes to represent objects.• Create their own songs, or improvise a song around one they know<ul style="list-style-type: none">• Be able to fix a model they have created when it breaks e.g. rebuilding a tower	<ul style="list-style-type: none">• Sing in a group or on their own, increasingly matching the pitch and following the melody.• Develop storylines in their pretend play.• Explore and engage in music making and dance, performing solo or in groups.• Begin to notice simple mistakes in their own work
Persevering <i>Not giving up</i>	<ul style="list-style-type: none">• Understand gradually how others might be feeling	<ul style="list-style-type: none">• Show resilience and perseverance in the face of challenge.• Think about the perspectives of others• Be confident to try new activities and show independence, resilience and perseverance in the face of challenge
Collaborating <i>Playing and working collaboratively</i>	<ul style="list-style-type: none">• Be able to express a point of view and to debate when they disagree with an adult or a friend, using words as well as actions.• Start a conversation with an adult or a friend and continue it for many turns.• Develop their sense of responsibility and membership of a community.• Play with one or more other children, extending and elaborating play ideas.• Talk with others to solve conflicts.• Start taking part in some group activities which they make up for themselves, or in teams.• Continue developing positive attitudes about the differences between people.• Play a simple turn taking game in a small group	<ul style="list-style-type: none">• Build constructive and respectful relationships.• Express their feelings and consider the feelings of others• Identify and moderate their own feelings socially and emotionally.• Work and play cooperatively and take turns with others.• Form positive attachments to adults and friendships with peers.• Show sensitivity to their own and to others' needs.• Be able to wait to take their turn to speak• Work collaboratively with a partner



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Cross-reference of the EYFS Computational Thinking concepts to the Prime Areas of Learning

	Communication and Language		Personal, Social and Emotional Development			Physical Development	
	Listening, Attention and Understanding	Speaking	Self-Regulation	Managing Self	Building relationships	Gross Motor Skills	Fine Motor Skills
Tinkering						✓	✓
Creating						✓	✓
Collaboration	✓		✓	✓	✓		
Persevering	✓			✓			
Logic	✓	✓					
Pattern	✓	✓					
Abstraction	✓	✓					
Algorithms and decomposition	✓	✓					



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Cross-reference of the Early Years Computational Thinking concepts to the Specific Areas of Learning