



Medium Term Unit Planning

Subject Name: Computing

Learning outcome:

Students will create programs with sequencing, loops, and events. They will investigate problem-solving techniques and develop strategies for building positive communities both online and offline. By the end of the course, students will create interactive games that they can share.

Hook

Topic Showcase (e.g. display, museum, performance, presentation)
Share own created games on website.
Showcase completed final projects at the end of the unit.

Oracy:

Children will have the opportunity to discuss how they created their games and final projects in assemblies and to the other Year 3 class.

Key Vocabulary: Algorithm, bug / debugging, sequencing, program, loop, event, binary

Key Texts (whole class reading/end of the day book/Talk for Writing Texts etc.): N/A

Citizenship/Community Opportunities:

Understand how online bullying is still bullying and the importance of being kind online to all.



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Experiences/Visits/Visitors N/A

Main Subjects covered: Computing

Computing Threshold concepts :

Code:

This concept involves developing an understanding of instructions, logic and sequences.

Connect

This concept involves developing an understanding of how to safely connect with others.

Collect

This concept involves developing an understanding of databases and their uses.

Communicate

This concept involves using apps to communicate one's ideas.

Notes:



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Lesson title and learning Intention	Threshold concepts (success criteria)	Milestones 2 (success criteria)	Lesson structure/differentiation
1. Putting a Stop to Online Meanness. Students will be able to: <ul style="list-style-type: none"> Identify ways to respond to mean words online, using S-T-O-P. Understand what online meanness can look like and how it can make people feel. 	Connect: This concept involves developing an understanding of how to safely connect with others.	<ul style="list-style-type: none"> Understand that comments made online that are hurtful or offensive are the same as bullying. Give examples of the risks posed by online communications. 	<ul style="list-style-type: none"> Discuss what meanness is and why it is often easier to be meaner to people online rather than face to face. Explore STOP: S- Step Away T – Tell a Trusted Adult O – OK sites only P – Pause and think Apply this acronym to given situations. Reflect on what has been discussed.
2. My Robotic Friends Jr. Students will be able to: <ul style="list-style-type: none"> Attend to precision when creating instructions Identify and address bugs or errors in sequenced instructions 	Code: This concept involves developing an understanding of instructions, logic and sequences.	Milestone 1: <ul style="list-style-type: none"> Control motion by specifying the number of steps to travel, direction and turn. 	<ul style="list-style-type: none"> Discuss that while robots appear to act like humans, they can only do as they are told. Following a set of simple symbol instructions instruct a friend how to move paper cups into a given pattern. Note any problems and introduce the idea of 'debugging' a program.
3. Programming with Angry Birds Students will be able to:	Code: This concept involves developing an understanding of	<ul style="list-style-type: none"> Use specified screen coordinates to control movement. 	<ul style="list-style-type: none"> Recall the symbols from last week and debugging techniques.



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<ul style="list-style-type: none"> • Identify and locate bugs in a program. • Translate movements into a series of commands. 	<p>instructions, logic and sequences.</p>		<ul style="list-style-type: none"> • Introduce programming blocks (Blockly Code) and how to use them. • Debug a sequence so the character does not hit the TNT. • Online – program Red so he gets around each maze. <p>Support: Have students describe the problem that they're seeing. What is it supposed to do? What does it do? What does that tell you?</p>
<p>4. Debugging in a Maze</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> • Modify an existing program to solve errors. • Predict where a program will fail. • Reflect on the debugging process in an age-appropriate way. 	<p>Code: This concept involves developing an understanding of instructions, logic and sequences.</p>	<ul style="list-style-type: none"> • Use specified screen coordinates to control movement. 	<ul style="list-style-type: none"> • Discuss how we solve problems everyday by following a series of steps. • Show them the tasks – they are all solved but not working – we need to debug them. • Discuss the ways we debugged the programs.



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<p>5. Collecting Treasure with Laurel</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> • Develop problem solving and critical thinking skills by reviewing debugging practices. • Order movement commands as sequential steps in a program. • Represent an algorithm as a computer program. 	<p>Code: This concept involves developing an understanding of instructions, logic and sequences.</p>	<ul style="list-style-type: none"> • Use specified screen coordinates to control movement. 	<ul style="list-style-type: none"> • Remind children of the programming blocks. • Introduce the ability to collect. • Discuss a pattern of programming that would enable the character Laurel to reach and collect the treasure. • Some levels will require them to only pick up one piece of treasure, but others will require them to pick up every piece of treasure.
<p>6. Creating Art with Code</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> • Break complex shapes into simple parts. • Create a program to complete an image using sequential steps. 	<p>Code: This concept involves developing an understanding of instructions, logic and sequences.</p>	<ul style="list-style-type: none"> • Use IF THEN conditions to control events or objects. • Control the shade of pens. 	<ul style="list-style-type: none"> • Introduce the children to the angles they will need for this lesson. • View video with JR Hildebrand. • Program the character to create the art, have protractors at hand for reference and help with angles.
<p>5. My Loopy Robotic Friends Jr</p> <p>Students will be able to:</p>	<p>Code: This concept involves developing an understanding of</p>	<p>Milestone 1:</p> <ul style="list-style-type: none"> • Control motion by specifying the number of steps to travel, direction and turn. 	<ul style="list-style-type: none"> • Remind children of the symbol key we used in lesson 2.



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<ul style="list-style-type: none"> Identify repeated patterns in code that could be replaced with a loop Write instructions that use loops to repeat patterns 	<p>instructions, logic and sequences.</p>		<ul style="list-style-type: none"> Try a problem that requires a lot of repetition. Discuss the function of loops. Complete cup activity as before but noting repeating patterns. Add loop command. Discuss how much shorter the program is when it contains these loops.
<p>6. Loops with Rey and BB8</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> Break down a long sequence of instructions into the largest repeatable sequence. Employ a combination of sequential and looped commands to reach the end of a maze. Identify the benefits of using a loop 	<p>Code: This concept involves developing an understanding of instructions, logic and sequences.</p>	<ul style="list-style-type: none"> Use specified screen coordinates to control movement. 	<ul style="list-style-type: none"> Complete a program from lesson 8 together – discuss the loops needed and how to program these in with Blockly Code. How did your loops make your program easier to write?



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<p>structure instead of manual repetition.</p>			
<p>7. Harvesting Crops with Loops Students will be able to:</p> <ul style="list-style-type: none"> • Employ a combination of sequential and looped commands to move and perform actions. • Identify when a loop can be used to simplify a repetitive action. • Write a program for a given task which loops a single command. 	<p>Code: This concept involves developing an understanding of instructions, logic and sequences.</p>	<ul style="list-style-type: none"> • Use specified screen coordinates to control movement. 	<ul style="list-style-type: none"> • Discuss use of loops so far in programming (loops for movement instructions). • Look at loops to pick up multiple items in the same place. • Use loops in programming to repeat actions. • Discuss if loops could also be used in the movement instructions.
<p>8. Mini Project: Sticker Art Students will be able to:</p> <ul style="list-style-type: none"> • Differentiate between commands that need to be repeated in loops and commands 	<p>Code: This concept involves developing an understanding of instructions, logic and sequences.</p>	<ul style="list-style-type: none"> • Use specified screen coordinates to control movement. 	<ul style="list-style-type: none"> • These levels have some new characteristics - explore before starting. • The code written in one level will automatically transfer over to the others. So they build gradually and iterate on their ideas as they learn.



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<p>that should be used on their own.</p> <ul style="list-style-type: none"> Identify the benefits of using a loop structure instead of manual repetition. 			
<p>9. The Big Event Students will be able to:</p> <ul style="list-style-type: none"> Practice differentiating pre-defined actions and event-driven ones. Recognize movements of the teacher as signals to initiate commands. Repeat commands given by an instructor. 	<p>Code: This concept involves developing an understanding of instructions, logic and sequences.</p>	<ul style="list-style-type: none"> Specify conditions to trigger events. 	<ul style="list-style-type: none"> Discuss what an event is in computing terms. Demonstrate how an event triggers a reaction by using a 'Event Controller' on IWB. Children count to 100 but are interrupted by events throughout. Discuss how previous lessons have been directing a character from a to z with no interruptions. But this is not how actual computer games work – we need options depending on what the user needs.
<p>10. Build a Flappy Game Students will be able to:</p> <ul style="list-style-type: none"> Create a game using event handlers. Match blocks with the appropriate event handler. 	<p>Code: This concept involves developing an understanding of instructions, logic and sequences.</p>	<ul style="list-style-type: none"> Create and edit sounds. Control when they are heard, their volume, duration and rests. Specify conditions to trigger events. Use specified screen coordinates to control movement. 	<ul style="list-style-type: none"> Add events to coding. Create an event for clicking the mouse and one for when the bird hits an object like the ground or an obstacle. Coding from level 6 will be linked up to level 10.



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<ul style="list-style-type: none"> • Share a creative artifact with other students. 			<ul style="list-style-type: none"> • Challenge: how different can the games be made within the constraints given.
<p>11. Mini Project: Chase Game</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> • Create an animated, interactive game using sequence and event-handlers. • Identify actions that correlate to input events. 	<p>Code: This concept involves developing an understanding of instructions, logic and sequences.</p>	<ul style="list-style-type: none"> • Create and edit sounds. Control when they are heard, their volume, duration and rests. • Specify conditions to trigger events. • Use specified screen coordinates to control movement. 	<ul style="list-style-type: none"> • Discuss the events from last week and what actions corresponded to the events. • Following the online levels, children create their own game.
<p>12. Picturing Data</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> • Collect and record data about quantities of real objects, or characters on a screen • Create a bar graph and pie chart to represent simple data. • Make comparisons between data visualizations made 	<p>Collect This concept involves developing an understanding of databases and their uses.</p>	<ul style="list-style-type: none"> • Devise and construct databases using applications designed for this purpose in areas across the curriculum. 	<ul style="list-style-type: none"> • Collect data and then visualise it on a variety of graphs – discuss the most useful presentation of the information. • Identify and answer questions on the data. • Discuss why different visuals (graphs in this case) are needed.



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<p>by others and use them to make a prediction.</p>			
<p>13. Binary Bracelets Students will be able to:</p> <ul style="list-style-type: none"> • Decode binary back to letters. • Encode letters into binary. • Relate the idea of storing letters on paper to the idea of storing information in a computer. 	<p>Code: This concept involves developing an understanding of instructions, logic and sequences.</p>		<ul style="list-style-type: none"> • Examine a message in Binary Code. • Discuss (simply) how computers work. • Introduce Binary Code and create messages for each other to translate.
<p>14. End of Course Project Students will be able to:</p> <ul style="list-style-type: none"> • Overcome obstacles such as time constraints or bugs. • Use a planned design as a blueprint for creation. 	<p>Code: This concept involves developing an understanding of instructions, logic and sequences.</p>	<ul style="list-style-type: none"> • Create and edit sounds. Control when they are heard, their volume, duration and rests. • Specify conditions to trigger events. • Use specified screen coordinates to control movement. 	<ul style="list-style-type: none"> • Plan the project in programming pairs – based on Hungry Squirrel or Alien Story templates. • Discuss the importance of some 'trial and error' approaches. • Showcase projects once completed – every child gets chance to view and play another's project and feed back.