**Computing Scheme of Work 2014 –Year 1**

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| **TERM** | **COMPUTING OBJECTIVES** | **ACTIVITIES & RESOURCES** |
| Computer Science – ProgrammingBee-Bot Tinkering | Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions Create and debug simple programs Use logical reasoning to predict the behaviour of simple programs  | **Bee Bot Guides and workshop notes**Emma Goto CAS workshop slides<http://www.code-it.co.uk/caswessex2014.html>TTS Bee Bot Guide / CCC Computing work cards<http://www.tts-group.co.uk/_RMVirtual/Media/Downloads/Bee-Bot_UserGuide.pdf>TES Bee bot instruction cards <http://www.tes.co.uk/teaching-resource/Bee-Bot-instruction-cards-6218189/> |
| **An Introduction to control Technology**Simon Haughton’s website<http://www.simonhaughton.co.uk/2010/06/an-introduction-to-control-technology.html> |
| **KEY SKILLS*** physically follow and give each other instructions to move around
* explore outcomes when buttons are pressed in sequences on a robot
* begin to identify an algorithm to achieve a specific purpose
* execute a program on a floor robot to achieve an algorithm
* begin to predict what will happen for a short sequence of instructions in a program
* begin to use software to create movement and patterns on a screen
* use the word debug to correct any mistakes when programming a floor robot

<https://slp.somerset.gov.uk/cypd/elim/somersetict/Site%20Pages/Computing%20Curriculum%20Primary/Primary_Computing_home.aspx?PageView=Shared> | **Bee Bot Skittles**Teach Bee bot to play skittles. Mark each skittle with a number that represents the points scored if bee bot knocks done the skittle. Experiment with different starting points, different formations for the skittles and distances apart.Barefoot Computing Bee Bit Tinkering<http://barefootcas.org.uk/># |
| **Bee Bot Stories**Queensland Government Bee-Bot Guide<http://elresources.skola.edu.mt/wp-content/uploads/2010/06/doc_669_2468_beebotguideA4v2.pdf>Rosie’s Walk’ by Pat HutchinsWe’re Going on a Bear Hunt – M.Rosen and H.OxenburyA Nice Walk in the Jungle – Nan BodsworthThe Very Hungry caterpillar |
| **Bee Bot Adventure see also Barefoot Computing Bee-Bot Tinkering**<http://www.tts-group.co.uk/_RMVirtual/Media/Downloads/BEEBOT-How-To-2.pdf><http://barefootcas.org.uk/>Create a 3D environment for your Bee-Bot. Can Bee-bot navigate the obstacles? Can he follow the route and travel under the bridge or through the tunnel you have made? |
| **Bee Bot mat activities**<http://www.tts-group.co.uk/_RMVirtual/Media/Downloads/BEEBOT-How-To-3.pdf>Place some numbered cards in the pockets of the transparent pocket mat.Ask a child, or group, to move Bee-Bot to the number that is 1 more than he is on. Progress to ask the children to move Bee-Bot to the number that is 2, 3 and 4 more than the number he is on, or to move to a number between e.g. 3 and 8. Try using Bee-Bot with single commands or a sequence. Also have a go with the Number Track Mat and use dice to determine the number of moves Bee-Bot should make or the Money Mat to introduce coin recognition. |
| **2Simple Infant Toolkit – 2Go.** Software from 2Simple and available as part of Purple Mash.  **Can be used with KS1 children to help reinforce work done with Bee-bot.**<https://docs.google.com/document/d/1ZnXPDrDibxtXcLTAtRey1EQ9pqcwz1symtkWbypHUIg/edit?pli=1> |
| **This lesson plan follows a treasure hunt / map work theme**. It could be adapted for your Year 1 class. It contains a number of ideas that teachers could build on.<http://fenditton.cambs.sch.uk/attachments/article/209/Computing_LP_Control_1.2.pdf> |

**Computing Scheme of Work 2014 –Year 2**

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| **TERM** | **COMPUTING OBJECTIVES** | **ACTIVITIES & RESOURCES** |
| Computer Science – ProgrammingHow to Train Your Robot / Bee-bots | Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions Create and debug simple programs Use logical reasoning to predict the behaviour of simple programs  | **Bee Bot 1,2,3 lessons from barefoot computing**http://barefootcas.org.uk/TTS Bee Bot Guide <http://www.tts-group.co.uk/_RMVirtual/Media/Downloads/Bee-Bot_UserGuide.pdf>TES Bee bot instruction cards <http://www.tes.co.uk/teaching-resource/Bee-Bot-instruction-cards-6218189/> |
| Dr Techniko How to Train Your Robot<http://drtechniko.com/2012/04/21/teaching-the-how-to-train-your-robot-class/>Barefoot Resources – Bee Bot 1,2,3 <http://barefootcas.org.uk/> |
| **KEY SKILLS*** physically follow and give each other forward, backward and turn (right-angle) instructions
* articulate an algorithm to achieve a purpose
* plan and enter a sequence of instructions to achieve an algorithm, with a robot specifying distance and turn and drawing a trail
* predict what will happen and test results,
* explore outcomes when giving instructions in a simple Logo program
* watch a Logo program execute using ‘allow programming’ in 2Go, debug any problems
* talk about similarities and differences between floor robots and logo on screen

<https://slp.somerset.gov.uk/cypd/elim/somersetict/Site%20Pages/Computing%20Curriculum%20Primary/Primary_Computing_home.aspx?PageView=Shared> | **Bee-Bot slalom buzzing game**Queensland Government Bee-Bot Guide<http://elresources.skola.edu.mt/wp-content/uploads/2010/06/doc_669_2468_beebotguideA4v2.pdf>Challenge your students to a Slalom Buzzing race. You can design your own slalom buzzing course around your classroom or have students create their own using either flags they have created using straws, lolly sticks and cardboard. Turn this activity into a game by either developing rules or collaboratively brainstorming rules with your class. For example, each student or group could get three attempts to program their Bee-Bot to buzz through the course. They could earn 5 points for each gate they pass through in attempt 1, 2 points for each gate in attempt 2 and 1 point for each gate in attempt 3. The winning team is the team with the most points. |
| **iPad apps**[Bee-Bot Garden - FREE](https://itunes.apple.com/gb/app/bee-bot/id500131639?mt=8) KS1/EYFS[Bee-Bot Pyramid](https://itunes.apple.com/gb/app/bee-bot-pyramid/id509207211?mt=8) KS2[Daisy the Dinosaur - FREE](https://itunes.apple.com/us/app/daisy-the-dinosaur/id490514278?mt=8) KS1 |
| **Scratch Online Bee-Bot Activities (create user account)**Use these<http://scratch.mit.edu/><http://scratch.mit.edu/projects/19799927/#editor><http://scratch.mit.edu/projects/20050141/#editor> |
| **2Simple Infant Toolkit – 2Go.** Software from 2Simple and available as part of Purple Mash.  **Can be used with KS1 children to help reinforce work done with Bee-bot.**<http://www.simonhaughton.co.uk/2011/11/teaching-control-programming-with-2go.html> |
| **TES iboard activities****Write your name using the toy**[**http://www.iboard.co.uk/iwb/Drawing-with-a-Control-Toy-697**](http://www.iboard.co.uk/iwb/Drawing-with-a-Control-Toy-697)Play TES iboard cheese sniffer game with a friend. You have five moves each turn. Play in a pair against another to encourage talk about the ‘most efficient’ set of moves to get to the next cheese. <http://www.iboard.co.uk/iwb/Cheese-Sniffer-657>**One key Logo**<http://scratch.redware.com/project/one-key-logo>**Programming Languages**http://www.j2e.com/j2code/http://www.scratchjr.org/teach.html |

**Computing Scheme of Work 2014 –Year 3**

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| **TERM** | **COMPUTING OBJECTIVES** | **ACTIVITIES & RESOURCES** |
| Computer Science – ProgrammingPro-bots / Logo / Scratch Introduction | Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts Use sequence, selection, and repetition in programs; work with variables and various forms of input and output Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs  | **Cracking the Code – BBC Video Clip**[**http://www.bbc.co.uk/programmes/p01661yg**](http://www.bbc.co.uk/programmes/p01661yg)Digital Schoolhouse resource linked to the video above<http://www.resources.digitalschoolhouse.org.uk/?searchword=probots&searchphrase=any&limit=&ordering=newest&view=search&Itemid=92&option=com_search> |
| **Probot / Turtle**Probot or other floor robot is used to explore regular polygons and other shapes. A procedure can be saved to create symmetrical patterns of polygons. Investigate the necessary instructions to include sound in a program. Children debug errors in their programming. Have incomplete programs and programs with errors that the pupils must fix. Give pupils a program and they must predict the outcome and then test their prediction to see if they were correct. CHALLENGE - Children use if command on Probot or other floor robot to program a response if the robot touches an obstacle or moves into the dark. Can you program it to move when you clap? They test and debug their programming. <http://www.simonhaughton.co.uk/pro-bot-lessons/> |
| **KEY SKILLS*** plan and enter a sequence of instructions on a robot specifying distance and turn to achieve specific outcomes
* test and improve / debug programmed sequences
* begin to type logo commands to achieve outcomes
* explore outcomes when giving sequences of instructions in Logo software
* use repeat to achieve solutions to tasks
* solve open-ended problems with a floor robot and Logo including creating simple regular polygons
* Use sensors to trigger an using Probot such as reversing or turning lights on
* sequence pre-written lines of programming into order
* talk about algorithms planned by others and identify any problems and the expected outcome

<https://slp.somerset.gov.uk/cypd/elim/somersetict/Site%20Pages/Computing%20Curriculum%20Primary/Primary_Computing_home.aspx?PageView=Shared> | **TES-iboard Spider web and Mole Maze** to develop understanding of the amount of turn required to plan to achieve specific outcomes. <http://www.iboard.co.uk/iwb/Spider-Web-665><http://www.iboard.co.uk/iwb/Mole-Maze-663> |
| **QCA Year 4 Unit – Modelling Effects on Screen**[http://webarchive.nationalarchives.gov.uk/20090608182316/http://standards.dfes.gov.uk/schemes2/it/itx4e/?view=get](http://webarchive.nationalarchives.gov.uk/20090608182316/http%3A//standards.dfes.gov.uk/schemes2/it/itx4e/?view=get)This old QCA unit has some good ideas that could be used |
| **Textease Studio or FSW logo** is used to write a letter, a name, to create procedures for regular polygons and other shapes such as a house, including the use of repeat command. They test and debug their own and the programs of others. Lightbot – Hour of Code <http://lightbot.com/hocflash.html>Rommy Robot - <http://www.sandaigprimary.co.uk/fun/rommy_robot.html> |
| **iPad apps**A.L.E.X app and Cargo-Bot are used to meet new challenges. Children are encouraged to talk about the algorithm that will be required to meet the higher levels of challenge.  |
| **NRICH Logo Resources**First Forward Into LogoThis series introduces Logo programming for beginners. These [12 challenges](http://nrich.maths.org/8045) are written for you to work through at your own pace. You don't need to know anything about programming at the start: you will learn enough at the first stage to write your own programs, and you may surprise yourself by how much you can achieve right away. [**http://nrich.maths.org/8045**](http://nrich.maths.org/8045)There's a version of Logo you can run directly in your browser at [http://calormen.com/logo/.](http://calormen.com/logo/) |
| Schools that haven’t invested in Textease Studio or other LOGO resource could continue using **2Go for Year 3**, adding **Allow Programming** options for children to build confidence and understanding with this resource before moving to FSW logo which is a free download.  |
| **Scratch and Introduction – Work cards 1-12 or Switch on Computing We Are Programmers****Scratch is used to create an animation of a Knock,Knock joke**<https://slp.somerset.gov.uk/cypd/elim/somersetict/Innovative%20Use%20of%20ICT/Programming/Scratch/scratch%201a%20Knock%20Knock.pdf>Barefoot Computing – Scratch Tinkering lesson plan |

**Computing Scheme of Work 2014 –Year 4**

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| **TERM** | **COMPUTING OBJECTIVES** | **ACTIVITIES & RESOURCES** |
| Computer Science – ProgrammingScratch Projects & 2D Shapes / Crystal Flowers | Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts Use sequence, selection, and repetition in programs; work with variables and various forms of input and output Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs | **Scratch Lesson Plans from the Irish Computer Society**<http://scratch.ie/primary/resources>Lesson 1 – Under the SeaUse problem solving and mathematical skillsCreate an animation incorporating movement and imagesLesson 2 – In the JungleUse xy coordinates to move sprites on the stageCreate an animation incorporating movement and imagesLesson 3 – Battle of the BandsAlternate between different sprite costumes, incorporating time and motion. Import, create and record sounds to use in their scratch projects. Lesson 4 – Cartoon About MeImport pictures from the computer and the internet into Scratch. Use images, sounds and movement to create a personal profile. Lesson 5 – In the GardenUse the pen function to create 2D shapes. Use lines and angles to create images. Use repeats to draw an image. Lesson 6 – Mini GameCreate a game which uses variables to calculate lives and score. Use sensing to effect change in a game. Lesson 7 – Computer GameCreate a game which uses sensing. Use sensing to effect change in a game. Lesson 8 – Game OverCreate a game which uses variables to calculate lives and score. Use sensing to effect change in a game. Lesson 9 – Movie ScriptPlan and create a film sequence. Use operators and sensing in their scripts. Lesson 10 – ProjectSet out their own goals for a project. Plan, create and edit a Scratch project. **iPad apps**Hopscotch app is used to develop repeat, wait and changes to appearance of objects on screen. They use random command and create parallel programs by adding tabs with different sprites. Children plan algorithms to achieve specific purposes. They create and debug programs. <http://www.gethopscotch.com/>i-LOGO app is used to extend confidence in using the correct syntax for LOGO, to view sequences to achieve different purposes. They plan algorithms, create and debug programming sequence to achieve a specified outcome. <https://itunes.apple.com/gb/app/i-logo/id435280247?mt=8>**Scratch 2D shapes and patterns**<http://www.digitalschoolhouse.org.uk/sites/default/files/cms/files/programming_languages.pdf>Barefoot Computing – 2D Shapes and Crystal Flowers lesson plans<http://community.computingatschool.org.uk/resources/2351>http://www.digitalschoolhouse.org.uk/workshops/generating-art-creating-shape-calculator-scratch |
| **KEY SKILLS*** create and edit procedures typing logo commands including pen up, pen down and changing the trail of the turtle
* solve open-ended problems with a floor robot, Logo and other software using efficient procedures to create shapes and letters
* experience a variety of resources to extend understanding and knowledge of programming
* create an algorithm and a program that will use a simple selection command for a game
* begin to correct errors (debug) as they program devices and actions on screen
* use an algorithm to sequence more complex programming into order
* link the use of algorithms to solve problems to work in Mathematics, Science and Design and Technology
* identify bugs in programs

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