Hive Hackers Scheme of Work

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| **Week** | **Topic** | **Lesson Overview** | **Activities** | **Extensions** | **Curriculum Links** | **Definitions** | **Resources** |
| 1 | Graph paper programming | Students are introduced to the concept of programming. Students instruct each other using algorithm to shade squares using the worksheets provided reproduce an existing picture. Students will also make paper airplanes by working out the correct algorithmic sequence. If time permits, students will decorate their plane. | Graph paper programming  Paper Planes | Graph paper programming extension worksheet  Decorate your paper plane | **5 E – Express:**  Students are creative in expressing their ideas on how their paper plane should be designed | **Algorithm** = A list of steps that you can follow to finish a task.  **Program** = An algorithm that has been coded into something that can be run by a machine. | Blank paper, markers, pens/pencils, scissors and glue  Paper for the paper airplane  Student workbook for Lesson 1  Teacher workbook for lesson 1 |
| 2 | Sequencing | Students will develop sequential algorithms to move a bird from one side of the maze to the pig at the other side by stacking blocks together in order to move straight or turn left or to turn right. In the second part of the lesson, students will take control of the Artist to complete simple drawings on the screen. The last part of the lesson (the extension activities) will focus on the start of the UICT task “On the Tiles” where students will have to create sequential code for a square, triangle and hexagon. | Log onto Code.org  **Code.org online lesson 3**: Maze Sequence  **Code.org online lesson 4:** Artist sequence | Create your own angry bird maze  UICT: On The Tiles Part 1 | **UICT TASK:** Planning a journey & exploring a maze  **UICT TASK:**  On the tiles | **URL** = **U**niform **R**esource **L**ocator. Finds a website on the Internet.  **Sequencing** = Tells us what will happen next in an algorithm or a program. | Blank paper, markers, pens/pencils, scissors and glue  Protractors & Login cards  Computers, iPads or Laptops. Padlet.com or file sharing account for online communication  Student workbook for Lesson 2  Teacher workbook for lesson 2 |
| 3 | Loops | Students practice converting sets of actions into a single loop. Students will use loops to move more efficiently through the maze with the angry bird and pig. Once students have finished this activity, they will apply what they have learnt in order to help the bee collect more nectar and make more honey. Students will be encouraged to use nested loops (looped statements inside another loop).Once complete students will apply their knowledge to the artist task. | **Code.org online lesson 6:** Maze loops – linked to UICT planning a journey & exploring a maze    **Code.org online lesson 8:** Bee Loops  **Code.org online Activity 7**: Artist Loops | UICT: On The Tiles Part 2 | **UICT TASK:** Planning a journey & exploring a maze  **UICT TASK:**  On the tiles | **Loop** = The action of doing something over and over again. | Blank paper, markers, pens/pencils, scissors and glue  Protractors & login cards  Computers, iPads or Laptops  Student workbook for Lesson 3  Teacher workbook for lesson 3  Padlet.com or file sharing account for online communication |
| 4 | Debugging | Students will be introduced to the concept of debugging (an essential element of learning to program). Students will encounter puzzles that have been solved incorrectly. They will step through the existing code to identify errors, including incorrect loops, missing blocks, extra blocks, and incorrectly ordered blocks. Students will continue practicing their debugging skills by helping the Artist to fix pictures that aren't coming out quite right. | **Code.org online lesson 9:** recap on graph paper programming  **Code.org online lesson 10**: Bee Debugging  **Code.org online lesson 11**: Artist Debugging | UICT: On The Tiles Part 3  Online Activity 7- Artist Sequence & create their own bugs and ask their peers to fix them  Students complete all activities from online activity 1 to online activity 11 | **UICT TASK:**  On the tiles | **Debugging** = Finding and fixing problems in your algorithm or program. | Blank paper, markers, pens/pencils, scissors and glue  Protractors & login cards  Computers, iPads or Laptops  Student workbook for Lesson 4  Teacher workbook for lesson 4  Padlet.com or file sharing account for online communication |
| 5 | Conditionals & Binary | This session demonstrates how conditionals can be used to tailor a program to specific information. Students are introduced to the conditional statement (code that functions differently depending on the conditions it encounters). Next, the concept of binary will be taught to students. Through a series of paper-based activities, students will explore and develop their understanding of binary. | Paper based activities in the week 5 student workbook. If statements and conditionals are explained in detail.  **Code.org online lesson 12**- Card Conditionals  **Code.org online lesson 13**- Bee Conditionals | **Online lesson 14**:  Binary  Binary: Crack The Code  Binary: Binary Bracelets  Binary: extension worksheets 1 & 2 |  | **Conditionals** = Statements that run under certain conditions  **Binary** = A way of representing information using only two options | Blank paper, markers, pens/pencils, scissors and glue  Protractors & login cards  Computers, iPads or Laptops  Student workbook for Lesson 5  Teacher workbook for lesson 5 |
| 6 | Flappy bird game | Students will move onto planning and building their own Flappy game by using event handlers (used to add variety to an algorithm) to detect mouse clicks and object collisions. Students will be encouraged to test their game with their friends. As an extension, students will learn about the similarities of staying safe in the real world and when visiting websites. Students will be introduced to the concept of a “digital footprint”. | Baby Shark (dance & song)  **Online lesson 16:** Flappy tasks 1-9  Plan flappy bird game  **Code.org online lesson 16:** task 10- plan game. | **Online Activity 18**: Your digital footprint  Follow the digital trail |  | **Event** = An action that causes something to happen.  **Digital footprint** = The trail you leave every time you go online. | Pens and pencils  Login cards  Computers, iPads or Laptops  Student workbook for Lesson 6  Teacher workbook for lesson 6  Padlet.com or file sharing account for online communication |
| 7 | Create a story | During this final session students will have the opportunity to apply all of the coding skills they've learned to create an animated story. First students will collaboratively come up with a theme using design thinking principals. Next, they will plan the story in detail ensure they have their plot and characters. Finally, they will code, test and refine their game based upon feedback from their peers. | Come up with a story theme  **Code.org online lesson 17**- Play Lab: Create a story - Activities 1-10  Plan your story using the worksheets provided in the student workbook  **Code.org online lesson 17**, **task 19** - Create a story - Activities 1-10 | **Code.org online Activity 19** – Nested Loops  Students work through all lessons from 1- 19 ensuring that all tasks in each lesson are complete. | **UICT TASK:**  Create an e-book | Recap of all vocabulary learnt so far | Pens and paper  Post-it notes  Login cards  Computers, iPads or Laptops  Student workbook for Lesson 7  Teacher workbook for lesson 7 |