|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Year 1 (KS1) | Year 2 (KS1) | Year 3 (KS2) | Year 4 (KS2) | Year 5 (KS2) | Year 6 (KS2) |
| Skills | Create symbolic algorithmUse this to program Beebots or other programmable toys | Inputs commands to control events for a predicted outcomeCreate and edit digital content | Using repeatCreating “efficient” codeCreate a program that implements algorithms to achieve a given goalDesign a solution that uses repetitionUses logical reasoning to predict outputs, showing an awareness of inputsUses diagrams to express solutions | Using “if/then” statementsUsing loopsUsing co-ordinatesUse relational operator within a loop to govern termination  | Create code using simple and  two way selectionUses nested statementsUse diagrams to express solutionsDesign algorithms using loops and selection | Reading a flow chartConverting algorithm into codeSubtracting from a variable |
| Concepts/computational thinking | Knows that computers need precise instructionsKnow what an algorithm is | Know that users can create their own programsKnow that solutions can be applied in different situationsUnderstand that algorithms are implemented on digital devices as programs | Abstraction (removing part of the procedure and making a sub-procedure)Generalisation/patterns (solutions which can be adapted to suit any shape)Knows that a procedure can be used to hide the detail with a sub-solutionRecognise that different solutions exist for the same problem |  | Understands the difference between if and if, then and else statements | Pattern recognition |
| Skills |  | Find and fix errors |  | Adapting and applying solutionsDebuggingAbstractionDecomposition | Uses a range of operators and negation expressions (eg Boolean )Uses arithmetic operatorsUses random selection | Converting algorithm into code. |
| Concepts/computational thinking |  | Understand that humans make errors and that programs sometimes need de-bugging |  | Know that different solutions exist for the same problemKnow that a procedure can be used to hide the detail | Shows an awareness of tasks best completed by humans or computersCan identify similarities and differences in situations and can use these to solve problemsUnderstand that iteration is the repetition of a process such as a loop | Recognises that some problems share the same characteristics and use the same algorithm to solve both |
| Skills |  |  |  | Has practical experience of high level textual language including using standard libraries when programming | Uses broadcast and receive | Use a mark up text – HTMLUse a VBA Code |
| Concepts/computational thinking |  |  |  | Understand that programming languages are text based. Opportunities for de-bugging as this is live coding. | Recognise that different algorithms exist for the same problemUnderstands the notion of performance for algorithms | Detects and corrects syntactical errors |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |