Medium Term Unit Planning

Topic Name: DT – Flowol computing

Learning outcome:
The children will be introduced to flowcharts and how they are used to program and control devices. Using Flowol, the children will be taught to build sequences of instructions, control multiple outputs and structure algorithms with decisions and inputs. To demonstrate their understanding and skills, the children will apply this learning to design, code and debug (where necessary) a robot toy.

Hook: Flowol with external hardware.	Topic Showcase (e.g. display, museum, performance, presentation): Coding a robot toy.
Oracy: In each lesson, the children will be taught a range of new key vocabulary which they will be expected to use accurately throughout the unit. Lesson 6 – the children will need to explain the decisions made when creating their robot toy and what instructions they have chosen to use to demonstrate their understanding.	**Key Vocabulary:** Flowol, flowchart, code, algorithm, control, input, output, mimic, simulation, insert, symbol, start, stop, delay, subroutine, decision, loop.

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

Citizenship/Community Opportunities (Focus – change in attitude/increase knowledge and awareness/make a difference):
The children will increase their knowledge of the world around them as they become more aware of the role computerised systems play in operating every day items (such a traffic lights).

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Experiences/Visits/Visitors:
Flowol external hardware.

Main subjects covered:
DT

DT threshold concepts:
Master practical skills
This concept involves developing the skills needed to make high quality products.

Notes:
This unit of work will draw upon the children's knowledge of coding (which they have developed in our other computing units). It will offer the children opportunities to practise with different instructions and these will be related to process and items that are common to the children. All of this practise will build towards the children's final showcase.

Lesson title and learning Intention	Threshold concepts (success criteria)	Milestones (success criteria)	Lesson structure/differentiation
1. To draw and interpret a flowchart with the correct symbols.	**Master practical skills** This concept involves developing the skills needed to make high quality products.	Write code to control and monitor models or products.	The children will be introduced to flowcharts and they will practise reading them as a sequence of instructions. This will involve understanding the different

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			symbols used and the purpose they hold. Once they are familiar with this, they will have a go at designing their own flowchart for several common activities e.g., making a cup of tea, running a bath, crossing the road.
2. To create and edit a flowchart to control a simulated device.	**Master practical skills** This concept involves developing the skills needed to make high quality products.	Write code to control and monitor models or products.	The children will use the control software (Flowol) to create a simple flowchart for a zebra crossing – this mimic will be used specifically for this lesson. In doing so, they will learn how to insert, edit and delete new symbols. They will begin by experimenting with the zebra crossing mimic as a class to see the results of inputting different symbols before they move

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			onto then create their own flowcharts for the crossing mimics.
3. To control multiple outputs at the same time.	**Master practical skills** This concept involves developing the skills needed to make high quality products.	Write code to control and monitor models or products.	This lesson will focus specifically on the Flowol traffic lights mimic (bridge lights). The children will control a simulated pair of traffic lights in sequence, which must run simultaneously. They will begin this by discussing the correct sequence used by traffic lights in order to function. As a class, the children will then show and test different outputs using this mimic leading them onto creating their own flowchart which controls multiple outputs in a sequence. As part of this, the children will learn about

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			how best to correct mistakes made.
4. To use a decision symbol based on the status of an input.	**Master practical skills** This concept involves developing the skills needed to make high quality products.	Write code to control and monitor models or products.	This lesson will centre around the lighthouse mimic. As a class, the children will use their knowledge of inputs, outputs and the symbols used to postulate how best to make the lighthouse's light flash when the sun is not shining. This will then lead to the children learning about how to use a decision symbol. Independently, the children will then deconstruct and then recreate a flowchart using a decision symbol, based on the input of the sunlight at a lighthouse.
5. To create a flowchart program	**Master practical skills**	Write code to control and monitor models or products.	The children will be introduced to the concept of subroutines by editing an

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containing a subroutine.	This concept involves developing the skills needed to make high quality products.		already familiar flowchart (lighthouse). They will begin by 'programming' one another to develop their understanding of subroutines. The children will then watch an example of a subroutine through the lighthouse mimic and how to create such a subroutine will be demonstrated for the class. The children will then design a flowchart to incorporate a subroutine called from the main flowchart (for the light and fog horn).
6. To design, write and debug my own flowchart program for a given task.	**Master practical skills** This concept involves developing the skills needed to make high quality products.	Write code to control and monitor models or products.	The lesson will begin with the children discussing what they have learnt over this unit regarding Flowol programming. The children will then be introduced to a new scenario (Robot

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			Toy/robot mimic) for which they must design and create their own programming solution in order to create a child's toy. This will involve one or more inputs controlling one or more outputs. The children will also be challenged to include subroutines for clearer organisation. The children will then swap with another pair to take part in a 'robot demo'.