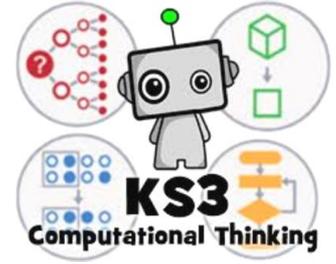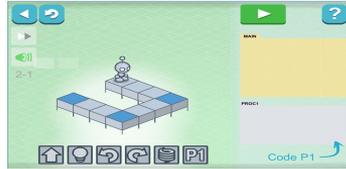# Year 7- Computational Thinking (Problem solving skills)

Decomposition

Breaking a problem down into simpler steps in solving problems
Use of light bots to explain the concept

Use of real life examples- Making a sandwich, organising a party, questions to ask at a crime scene etc

Abstraction

Focus on general patterns and not specific details
Why is abstraction important in problem solving?
Designing models- Use of real Life examples

Use of 'Design your own Avatar' to understand abstraction
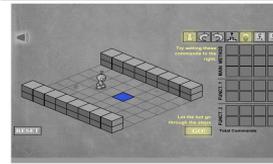

Pattern recognition

Identification of repetition of certain tasks and making a function of it
Importance of identifying functions in problem solving
Using a number line and identifying a rule
Use of lightbots to explain why are functions needed

Algorithm

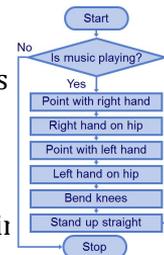Sequence of instructions
Why is sequence important
In algorithms?
Two ways of writing instructions
-Pseudocodes
- Flow Charts

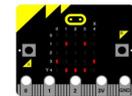Importance of using algorithms in programming

A mini-project on bbc block editor using micro:bit-

Pupils using CT skills to design a solution for compass
Use of Block editor

Mini-Projects using Micro:bit
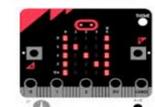Scripts found in Google Classroom
1- Making a smiley face
2- Making a timer
3- Making a compass

KS3 Computing Med SOW: Computational Thinking				
Lesson	**Topic**	**Lesson type**	**Suggested activities**	**Classroom resources**
1	Decomposition	Practical/Theoretical	• **Do Now:** Introduce learners to the unit and to computational thinking. • **Starter:** Computational thinking involves taking that complex problem and breaking it down into a series of small, more manageable problems. Provide a task for students to decompose. • **Task 1:** Decompose the problem of making a sandwich. You are making a sandwich for a friend, what questions should you ask before making the sandwich? • **Task 2:** Students will plan a sequence of instructions to move a robot. • **Plenary:** Share feedback on the group activity. Summarise lesson and use Q&A to establish learners' understanding. E.g spinner, blooms etc Sen/Ext: Students to write more or less instructions based on their ability	https://lightbot.com/flash.html
2	Patterns/ Pattern recognition		• **Do Now:** Should introduce students to pattern recognition • **Starter:** A spot the difference task will help students find common elements within a solution • **Task 1/2:** Plan a sequence of instructions to create a Procedure. Students can use lightbots to understand pattern recognition, teacher to introduce procedure. • **Plenary:** Share feedback on the group activity. Summarise lesson and use Q&A to establish learners' understanding. E.g spinner, blooms etc Sen/Ext: Students to write more or less instructions based on their ability	https://lightbot.com/flash.html

KS3 Computing Med SOW: Computational Thinking				
Lesson	**Topic**	**Lesson type**	**Suggested activities**	**Classroom resources**
3	Abstraction	Theoretical	• **Do Now:** Introduce learners to Abstraction. • **Starter:** Students to look at everyday objects and simplify the into simple shapes e.g door - rectangle • **Task 1:** Students to abstract a simple task. Cake making there are different types of cake but the basics of making them are the same. • **Task 2:** Create a model of a cat. Different breeds have different characteristics but what is common in all Cats? • **Plenary:** Share feedback on the group activity. Summarise lesson and use Q&A to establish learners' understanding. E.g spinner, blooms etc Sen/Ext: Students to write more or less instructions based on their ability	
4	Algorithms	Theoretical	• **Do Now:** Introduce learners to Flowcharts. • **Starter:** Create a list of instructions to tell someone how to make a sandwich • **Task 1:** Students to learn flowchart symbols. E.g stop/start, process • **Task 2:** Students to create there own flowchart for a task • **Plenary:** Share feedback on the group activity. Summarise lesson and use Q&A to establish learners' understanding. E.g spinner, blooms etc Sen/Ext: Use more or less symbols and complexity of flowchart	

KS3 Computing Med SOW: Computational Thinking				
Lesson	**Topic**	**Lesson type**	**Suggested activities**	**Classroom resources**
5-6	Microbit 1	Practical	● **Do Now:** Introduce learners to programming a device. ● **Starter: Label micro bit device** ● **Task 1:**Students upload a simple script onto device ● **Task 2:** Students create different emoji for device utilizing LED lights ● **Plenary:** Share feedback on the group activity. Summarise lesson and use Q&A to establish learners' understanding. E.g spinner, blooms etc Sen/Ext: Students to use more/less complex scripting techniques teacher to provide worksheet	**http://www.bbc.co.uk/programmes/articles/4hVG2Br1W1LKCmw8nSm9WnQ/the-bbc-micr%20o-bit**