RECOVERY CURRICULUM

Subject: CS
Author: ACR
Created: 29.06.20
Updated: N.A.
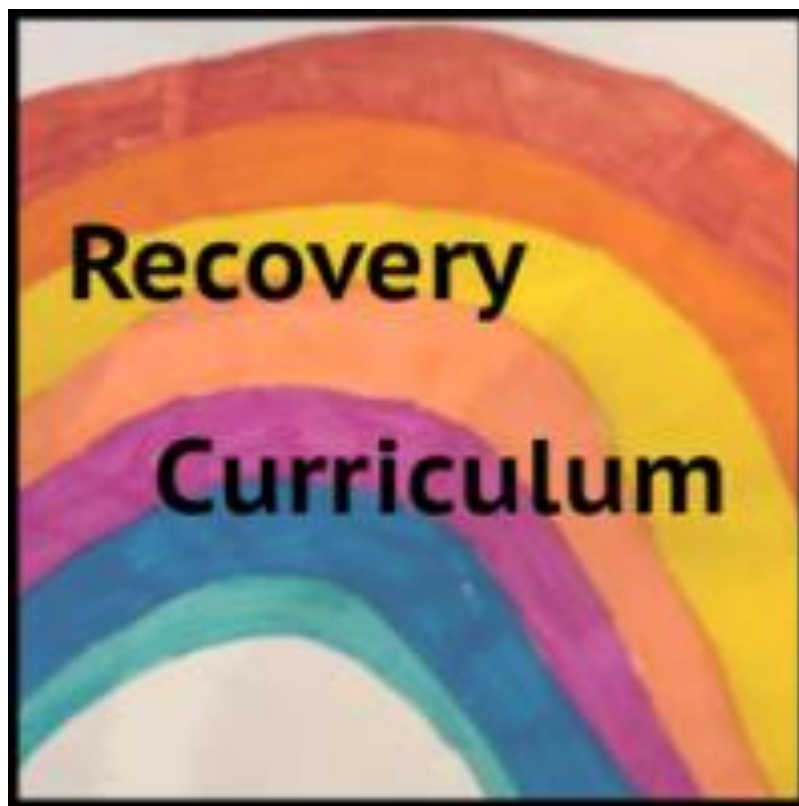
Subject:	CS		Teacher:	Lead: GMA
Year:	11		Class:	All
Unit title:	Problem Solving in Python			
Duration:	Term 1			

Intent

Intent Statement - at Landau Forte Amington, we believe learning powerful knowledge helps students achieve and creates a fairer society. How are you trying to accomplish this, with this unit/topic?

This topic will focus on student recovery following the pandemic, which has resulted in students experiencing the following possible losses: routine, structure, friendship, opportunity and freedom. It will support students academically, socially and emotionally, in order to transition students back to Academy life and support with the issues resulting from loss.

Aims - what do you want pupils to be able to know and do by the time they finish this unit/topic?

Can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation
Can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems, and apply systematic problem solving.

Academy values – at Landau Forte Amington, we want students to be ambitious, brave and kind. How are these values promoted in this PoS?

Brave: Empower pupils to become digitally literate in order to able to use, and express themselves and develop their ideas through, information and communication technology. Encourages pupils independence by providing the opportunity to formulate solutions to the problems at hand, create a culture of error by encouraging pupils to create creative solutions to a complex problem and debug problems and modify for efficiency.

Ambitious: Delivery of challenging concepts and ideas. Utilisation of tiered BEBRAS DNA, stretch tasks provided to challenge HA. Resilience promoted through independent learning.

Kind to become digitally literate in order to become active participants in a digital society and workplace. . Alternative provision prepared in the eventuality of a local/national lockdown. Baseline testing and progressive knowledge auditing throughout to better plan lessons.

Content – what is being covered, ensuring breadth & depth?	National Curriculum/Exam Specification - how does the content link to the NC or Exam Spec?
Programming (NEA) • Designing the solution • Creating the solution • Testing the solution • Potential enhancements and refinements	**Programming skill project (non assessed component)** Centre designed programming skills project that assess students ability to: • Design • Write • Test • Refine

Powerful Knowledge - what powerful knowledge is included in this SoW? Consider what knowledge is it important for our students to know, so that when they leave school they can engage in and lead discussions, with people from the most advantaged backgrounds?

How to program / Concepts of programming

Abstraction and Decomposition.

Implementation

GAPS	
Identification – how are you going to identify the gaps in knowledge/skills?	**Triage** – how are you going to rank order these gaps in knowledge/skills and 'fill' them, in order of importance?
Create a baseline test of programming knowledge before the programming unit at the start of term. This will identify uptake/ areas of confusion etc.	The results of the baseline test will determine if a group needs to revisit a year 9 topic or spend extended time on a topic in GCSE.

Use of knowledge audit to tailor learning in future terms or adapt learning based on pupil needs. Identified there may knowledge/skill gaps in core computer science principles that need to be addressed/revisited Identify computer access outside of school. Identified from government documentation the NEA no longer needs to be supervised	Knowledge audits will determine which pupils will require more support in specific topics for example: 1 to 1, teacher support, scaffolded answers or support from a peer. Baseline and audit review will determine if wider planning needs to be amended, E.G. revisiting a topic of spending more time on a topic. **Plan to run controlled assessment upon return, if pupils are lacking technology at home, we will support these with the IT technicians, if this is still an issue, the SOW will have to be revisited.**

KEY CONCEPTS

Key Concepts – what are the key concepts being taught?	**Progression** – how will studying these key concepts support progression to the traditional curriculum that has been planned?
Inputs: Text based programming. Variables and Operators: Types, uses and selection. Iteration: Loops and repetition. Data Structure: Lists and arrays. Subroutines: Definition and creation. Of subroutines.	**These key concepts follow the traditional curriculum plan in the initial implementation document.** **Taken from the existing traditional curriculum and modified to suit the needs of an extended leave of absence.** **IF A BLENDED LEARNING APPROACH IS REQUIRED, modified versions of each lesson in the SOW have been created** **The alternative series of lessons covers the same topics in a more user-friendly format for pupils studying at home.** **Plan to run controlled assessment upon return, if pupils are lacking technology at home, we will support these with the IT technicians, if this is still an issue, the SOW will have to revert to programming unit.**

WELLBEING	
Lockdown – how will students share their experiences of lockdown?	**Social and Emotional** – how will student social and emotional health be supported?
Cybersecurity module will run later in the year and will focus on the impacts of lockdown in more detail. Discussion of how the government use algorithms to formulate the 'R number', and using computer models of virus spread scenarios.	Differentiation – this will occur through additional resources, scaffolded tasks, targeted questioning and self-assessment. Peer assessment – this will happen throughout the course with pupils discussing their individual approaches to the task at hand. Classroom discussions – throughout the course each of the concepts will be discussed with pupils being able to offer their opinions of the concepts as well as the teacher tackling misconceptions. Ensuring exam arrangements have been met for controlled assessment
RE-ESTABLISH	
Learning Skills – how are you going to re-establish the skills for learning?	**Relationships** – how are you going to re-establish classroom relationships?
Introduction lesson: re-establish rules for the Computer Science classroom. Discussion of controlled assessment element of the course, I.E. key skills, layout, assessment requirements etc. Each lesson starts with an overview of topics covered in that lesson as well as each new module includes an overview of topics that will be in that module. Discussion of exam key words. Computing baseline. Routine in look and structure of lesson with recap lessons at the end of each cycle.	Discussions in classroom around different topics based on current lesson, challenging concepts posed by the teacher, in a respectful way, is encouraged. Introduction focused on kindness and compassion Recap discussions around the legal, ethical and environmental issues and link to real world examples of corona virus, E.g. benefits of track and trace Vs privacy loss. Attempt to embed more classroom dialogue into planning. E.g. how data theft is part of everyday life, and what we should do about it.

	OPPORTUNITIES	
Discussion – what are the discussion based opportunities?		**Group** – what are the group work based opportunities (while still ensuring social distancing)?
Reflective discussion at the end of each lesson that looks at how pupils solved the problem using different solutions, discussing their approach and the benefits and drawbacks to each solution Recap discussions around the legal, ethical and environmental issues and link to real world examples of corona virus, E.g. benefits of track and trace Vs privacy loss.		Peer assessment, during the discussions held at the end of the lessons Group work dependent on the requirements and regulations of controlled assessment

Delivery

		1) Lesson Type (classroom or blended for remote homework)		2) DNA (Do Now Activity/Reading)	3) Learning Intentions (what, why & how)			
1		Classroom (whole sequence completed)	☐		What	Programming basics		
					Why	Understand the basic commands of programming		
		Blended (live and remote as independent study) **IF A BLENDED LEARNING APPROACH IS REQUIRED, AN ALTERNATIVE SCHEME OF WORK ON THE SAME CONTENT IS AVAILABLE FROM THE TEACH COMPUTING HOME TEACHING REPOSITORY (6 LESSONS AVAILABLE).**	☐	**BEBRAS Activity**	How	E	Understand and demonstrate how to use variables	
						4 – 5	Understand and demonstrate how to manipulate data.	

<table>
<tr><td colspan="3" rowspan="2">https://teachcomputing.org/home-teaching/python-programming-pathway-1/

THIS SERIES OF LESSONS COVERS THE SAME TOPICS BUT IN A MORE USER-FRIENDLY FORMAT FOR PUPILS STUDYING AT HOME.</td><td>**5 +**</td><td>Demonstrate how to use pseudocode.</td><td></td></tr>
<tr><td colspan="3"></td></tr>
</table>

	4) New Material (previous learning/ new material)	5) Check for Understanding (questioning/checking)	6) Prepare for Practice (model/ scaffold)	
Number of lessons in cycle:	Data types, Variables, Constants, input/output, String handling operations, Arithmetic Operations, Sequence	**Use of various questioning techniques throughout the lesson**	At the task stage the teacher will model one of the examples, making it clear that this is just one way of completing the problem	Synchronous (live)
	7) Deliberate Practice (guided/ independent)	8) Feedback (light/deep)	9) Review (daily/monthly)	
	The task will be complete independently	**The teacher will ask for volunteers to demonstrate their code, and display their code on the board with permission**	Review will take place monthly	Asynchronous (remote)

2		1) Lesson Type (classroom or blended for remote homework)		2) DNA (Do Now Activity/Reading)	3) Learning Intentions (what, why & how)	
		Classroom (whole sequence completed)	☐		What	IF Statements
		Blended (live and remote as independent study) **IF A BLENDED LEARNING APPROACH IS REQUIRED, AN ALTERNATIVE SCHEME OF WORK ON THE SAME CONTENT IS AVAILABLE FROM THE TEACH COMPUTING HOME TEACHING**	☐	**BEBRAS Activity**	Why	Understand the use of selection and programming structure
					How	**E** Demonstrate how to use selection statements

4 – 5	Demonstrate how to use nested selection statements
5 +	Use pseudocode

Number of lessons in cycle:	4) New Material (previous learning/ new material)	5) Check for Understanding (questioning/checking)	6) Prepare for Practice (model/ scaffold)	
	Casting, selection, relational operations, Boolean operations, these concepts build upon the concepts of last lesson	**The starter is used to ensure the concepts of last lesson are fully understood, Use of various questioning techniques throughout the lesson**	At the task stage the teacher will model one of the examples, making it clear that this is just one way of completing the problem	Synchronous (live)
	7) Deliberate Practice (guided/ independent)	8) Feedback (light/deep)	9) Review (daily/monthly)	
	The task will be complete independently	**The teacher will ask for volunteers to demonstrate their code, and display their code on the board with permission**	Review will take place monthly	Asynchronous (remote)

3		1) Lesson Type (classroom or blended for remote homework)		2) DNA (Do Now Activity/Reading)	3) Learning Intentions (what, why & how)		
		Classroom (whole sequence completed)	☐		What	For loops	
					Why	To understand how to implement iteration into programming structures	
		Blended (live and remote as independent study) **IF A BLENDED LEARNING APPROACH IS REQUIRED, AN ALTERNATIVE SCHEME OF WORK ON THE SAME CONTENT IS AVAILABLE FROM THE TEACH**	☐	**BEBRAS Activity**	How	E	Demonstrate how to use definite iteration

3 - 4	Demonstrate how to use indefinite iteration	
5 +	Use pseudocode.	

Number of lessons in cycle:	4) New Material (previous learning/ new material)	5) Check for Understanding (questioning/checking)	6) Prepare for Practice (model/ scaffold)	Synchronous (live)
	Utilisation of mathematical operators on variables	**The starter is used to ensure the concepts of last lesson are fully understood,** **Use of various questioning techniques throughout the lesson**	At the task stage the teacher will model one of the examples, making it clear that this is just one way of completing the problem	
	7) Deliberate Practice (guided/ independent)	8) Feedback (light/deep)	9) Review (daily/monthly)	Asynchronous (remote)
	The task will be complete independently	**The teacher will ask for volunteers to demonstrate their code, and display their code on the board with permission**	Review will take place monthly	

	1) Lesson Type (classroom or blended for remote homework)	2) DNA (Do Now Activity/Reading)	3) Learning Intentions (what, why & how)	
4	Classroom (whole sequence completed) ☐	**BEBRAS Activity**	What	While loops
			Why	To understand how to implement iteration into programming structures
	Blended (live and remote as independent study) **IF A BLENDED LEARNING APPROACH IS REQUIRED, AN ALTERNATIVE SCHEME OF WORK ON THE SAME CONTENT IS AVAILABLE FROM THE TEACH** ☐		How	**E** Demonstrate how to use definite iteration

			4 – 5	Demonstrate how to use indefinite iteration	
				5 +	Use pseudocode.	

	Number of lessons in cycle:	4) New Material (previous learning/ new material)	5) Check for Understanding (questioning/checking)	6) Prepare for Practice (model/ scaffold)	Synchronous (live)
		In depth use of iteration and how best to use the different types, random number generation	**The starter is used to ensure the concepts of last lesson are fully understood,** **Use of various questioning techniques throughout the lesson**	At the task stage the teacher will model one of the examples, making it clear that this is just one way of completing the problem	
		7) Deliberate Practice (guided/ independent)	8) Feedback (light/deep)	9) Review (daily/monthly)	Asynchronous (remote)
		The task will be complete independently	**The teacher will ask for volunteers to demonstrate their code, and display their code on the board with permission**	Review will take place monthly	

		1) Lesson Type (classroom or blended for remote homework)		2) DNA (Do Now Activity/Reading)	3) Learning Intentions (what, why & how)		
5		Classroom (whole sequence completed)	☐		What	Functions	
					Why	Develop knowledge of programming	
		Blended (live and remote as independent study) **IF A BLENDED LEARNING APPROACH IS REQUIRED, AN ALTERNATIVE SCHEME OF WORK**	☐	**BEBRAS Activity**	How	**E**	Demonstrate how to define functions

<table>
<tr><td rowspan="2" colspan="2">

</td></tr>
</table>

4 – 5	Demonstrate how to use Functions	
5 +	Use pseudocode.	

Number of lessons in cycle:

4) New Material (previous learning/ new material)	5) Check for Understanding (questioning/checking)	6) Prepare for Practice (model/ scaffold)	Synchronous (live)
Types of subroutines and their uses, how subroutines 'fit' into the sequence of a program, correct programming etiquette.	**The starter is used to ensure the concepts of last lesson are fully understood, Use of various questioning techniques throughout the lesson**	At the task stage the teacher will model one of the examples, making it clear that this is just one way of completing the problem and as such the problem can still be attempted by the student in a different way	
7) Deliberate Practice (guided/ independent)	8) Feedback (light/deep)	9) Review (daily/monthly)	Asynchronous (remote)
The task will be complete independently	**The teacher will ask for volunteers to demonstrate their code, and display their code on the board with permission**	Review will take place monthly	

6	1) Lesson Type (classroom or blended for remote homework)		2) DNA (Do Now Activity/Reading)	3) Learning Intentions (what, why & how)	
	Classroom (whole sequence completed)	☐	**BEBRAS Activity**	What	Arrays
	Blended (live and remote as independent study)	☐		Why	Develop further skills in programming

How		
	E	Demonstrate how to use 1-dimensional arrays
	4 – 5	Demonstrate how to use 2-dimensional arrays
	5 +	Use pseudocode.

		4) New Material (previous learning/ new material)	5) Check for Understanding (questioning/checking)	6) Prepare for Practice (model/ scaffold)	Synchronous (live)
Number of lessons in cycle:		Data handling, lists/arrays, records/dictionaries, tuples	**The starter is used to ensure the concepts of last lesson are fully understood,** Use of various questioning techniques throughout the lesson	At the task stage the teacher will model one of the examples, making it clear that this is just one way of completing the problem and as such the problem can still be attempted by the student in a different way	
		7) Deliberate Practice (guided/ independent)	8) Feedback (light/deep)	9) Review (daily/monthly)	Asynchronous (remote)
		The task will be complete independently	**The teacher will ask for volunteers to demonstrate their code, and display their code on the board with permission**	Review will take place monthly	

7		1) Lesson Type (classroom or blended for remote homework)	2) DNA (Do Now Activity/Reading)	3) Learning Intentions (what, why & how)

Classroom (whole sequence completed)	☐				

☐

BEBRAS Activity

What	Use of files in programs
Why	Develop knowledge of programming

How		
E	Explain how text files can be used
4 – 5	Explain how CSV can be used
5 +	Explain and use all the programming skills

Number of lessons in cycle:

4) New Material (previous learning/ new material)	5) Check for Understanding (questioning/checking)	6) Prepare for Practice (model/ scaffold)	Synchronous (live)
File types and their uses, how files 'fit' into the sequence of a program, correct programming etiquette.	**The starter is used to ensure the concepts of last lesson are fully understood, Use of various questioning techniques throughout the lesson**	At the task stage the teacher will model one of the examples, making it clear that this is just one way of completing the problem and as such the problem can still be attempted by the student in a different way	
7) Deliberate Practice (guided/ independent)	8) Feedback (light/deep)	9) Review (daily/monthly)	Asynchronous (remote)
The task will be complete independently	**The teacher will ask for volunteers to demonstrate their code, and display their code on the board with permission**	Review will take place monthly	