Year 1 Spring 1 Short Term Plan - Algorithms

Unit Rationale

This unit introduces children to the concept of algorithms. It uses real life examples such as brushing teeth, getting dressed, making a sandwich, navigating a maze before applying the knowledge to simple computer games, where the children have to direct characters around mazes using instructions that are clear and in the correct order.

National Curriculum Objectives:	Cross Curricular Links:
• understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions • create and debug simple programs • use logical reasoning to predict the behaviour of simple programs	
Trips/Visits:	**Modern Day Links:**
Prior Learning:	**Substantive Knowledge:**
	An algorithm is a list of steps to solve something or get something done.
Big ideas/Disciplinary Knowledge	**What next?**
thinking like a computer scientist	In year 2, algorithms are recapped and children start to learn how they are written in computer language to get computers to perform different tasks.

Lesson	WALT	What should the children remember?	Lesson plan and outcome	Key Vocabulary	Key Questions
1	**See E-Safety lessons**		See E-Safety lessons		
Lesson 2	**Understand what an algorithm is**	An algorithm is a list of steps to solve something or get something done. Algorithms need to be clear and in the right order.	**NOTE: Ensure that you have cold weather clothes, hat, gloves, coat, scarf etc for alien example. Print and cut out the activity sheet beforehand. Chromebooks not needed.** What is an algorithm? Watch video https://www.bbc.co.uk/bitesize/articles/z3whpv4 Teaching - What is an algorithm? - Examples of algorithms in everyday life (see slides) Alien getting dressed example - T to pretend that they are an alien and don't know how to get dressed for cold weather. Get instructions from the class to put on shoes, coat, hat, gloves. Deliberately make mistakes (e.g. put shoes on the table, on top of your feet etc) to get clearer answers. - Make the point that algorithms (instructions) need to be clear and in the right order. Activity - Children to solve teeth brushing challenge Plenary	**Algorithm** **Instructions** **Order** **Clear**	**What is an algorithm?**

			- Run through answers for the challenge as a class, is there more than one correct answer? - Quiz - What is an algorithm? Can you give me an example?		
Lesson 3	**Follow and write simple algorithms**		NOTE: You will need to create some space in the classroom and gather green and grey paper for this lesson. Post Lily hop game link on GC stream before lesson. **Quiz** See slides **Show WALT** **Teaching** Last week we learned that algorithms are a list of steps to solve something or get something done and that they need to be clear and in the right order. Explain that today we will be writing/following algorithms to help Fred the Frog get safely across the pond to a rock. **Activities:** **Fred the frog - See slides** - Follow the algorithm - will it get him to the rock? - TTYP and get answers before working it through - Write an algorithm to get him to the rock - TTYP - write answers on a whiteboard using arrows and numbers. **Fred the frog physical activity** - Create Fred the frog mazes on the classroom floor using sheets of green (lily pads) and grey (rocks) paper.	**Algorithm** **Steps** **Instructions** **Follow**	**What is an algorithm?** **Why do they have to be clear and in the right order?**

			- Select children to be a frog - Can the class give them instructions to get safely to the rock? - Can the class write a whole algorithm to get them to the rock? Draw out the idea that our algorithms have to be clear and in the right order for people to get to the rock safely. **Lily hop game**: Minimum 10 min Teacher to re-model using the Lily Hop Game. Follow the steo by step instructions. - Count the squares needed to jump - Change the number using the + and - buttons - Click on the correct direction arrow. Discourage children from leaving the number at 1 and just using the arrows to move it like an action game. They will get more points if they can get Fred to the rock using less instructions (e.g. up 2, right 3, down 1 - is only 3 instructions). Lily hop game https://scratch.mit.edu/projects/108149970/fullscreen/ **Plenary** Keep a record of high scores. Ask pupils to share what they did to get a high score.		
Lesson 4	**Predict what an algorithm will do and correct (debug) it.**		Allow more time this lesson to let the children use the Chromebooks for the activity. Post the game link beforehand on Google Classroom for easy access. **Quiz** See slides	**Algorithm** **Predict** **Debug**	**What is an algorithm?** **Can they predict what an algorithm**

			Show WALT **Teaching** Read out the algorithm of washing up. TTYP: Was is the person doing? Read out the algorithm for making breakfast (cereal). TTYP: What is the person doing? Is it in the correct order? Show children fred mazes. Can they predict where Fred will go? TTYP: Where will the instructions take him? Can they fix it if it's wrong? (Computing word - debug - fix errors) **Activity**: Minimum 10-15 min Teacher to model using the Diamond hunter game Follow the step by step instructions. - Count the squares needed to jump - Change the number using the + and - buttons - Click on the correct direction arrow. Discourage children from leaving the number at 1 and just using the arrows to move it like an action game. Diamond hunter https://scratch.mit.edu/projects/190848222/fullscreen/ **Plenary** Keep a record of high scores. Ask pupils to share what they did to get a high score.		**will do?** **Can they debug an algorithm?**
Lesson 5	**Write, test and debug an**		Share Game link on Google Classroom stream before lesson.		

	algorithm.		**Quiz** See slides **Show WALT** **Teaching/Activity** Explain to children that they are going to be creating and debugging their own algorithms on the Rodocodo game. Model how to use it OR play the video below. **Rodo Kodo Game for Year One Classes - Watch Video**  **Hi there, it's Mr Harwood here, and I wanted to share this Rodo Kodo game for our year one classes. In this video, I'll walk you through how to play the game and give you some tips on how to navigate the levels. The game is designed for ages 4 to 7 and helps students practise giving instructions to a cat to reach the finish line. Watch the video to learn more and try it out with your students!**		

			Game link to post on GC: https://game.rodocodo.com/hour-of-code/ Encourage children to ask for help from their partners and share their algorithms. **Plenary** Celebrate children who have made good progress on the game. Remind children that the game is available for free and that they can play it at home. Post the link out on dojo to encourage them to try it.		