Computing Ideas to complete at home.

Below is a list of suggested computing activities that could be completed at home by parents and children. All websites and resources are free and I have considered the likelihood of most households having the items required.

These are based on the progression documents in our school, which are linked to the national curriculum and Early Learning objectives in England.

Follow on Twitter @MRMICT for more.

Reception/P1

Knowing and Algorithm is a set of instructions and what these instructions can look like…

- **Active Learning** – *motivation* – Put instructions into order, as a family pick a few favourite recipes and mix up the order of the instructions see if you can put them back in the right order. Perhaps the recipe still works in the 'wrong' order? Does it taste better? Could you improve it?
- **Playing and Exploring** – *engagement* – Could you and your family create your own board game or maze game based on traditional tales like 'Little Red Riding Hood'? Try to think carefully about the path she took. Remember instructions (Algorithms) work best when they are concise and clear. Could you play it on a larger scale? Could you become the character and your family the navigators? Perhaps to gather treasure at the end, an Easter egg hunt?
- **Creating and thinking critically** – *thinking* – After reading your favourite story why not draw key moments from the story and place them in a new sequence. Can you create a whole new story? Try reading a similar story, could you predict what will happen next?

If you want to try some plugged coding a great resource can be found at https://studio.code.org/s/pre-express-2019

Year 1/P2

Being able to create simple instructions to solve problems…

- As a family you could write instructions to build a Lego model. You could draw a picture of what the model will look like completed and challenge your family members to build it following your instructions. After which you could debug the instructions together. Could they be improved?
- Fancy some lunch? Thinking about recipes again, why not write a recipe to create a sandwich? Can your family follow it… The best bit, you get to eat the sandwich! This video can help you refine your instructions... https://www.youtube.com/watch?v=Ct-lOOUqmyY&fbclid=IwAR2DQzxQg8xhnp5nIhMUSnF0RnpTWuVXziNgg6Hi6cJDBlw4FQvOgyIzviw&app=desktop
- Feeling Arty? Draw a picture and think about the steps and instructions involved in drawing each element. Then, again, challenge your family to draw it based on your instructions. Do all the drawings look the same? This activity from Barefoot might help… https://www.barefootcomputing.org/resources/crazy-character-algorithms

Year 2/P3

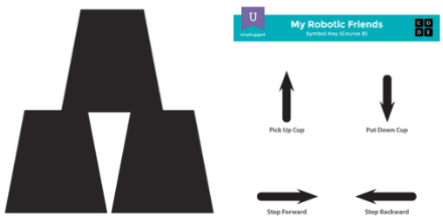
Knowing that Algorithms are used on arrange of digital devices…

- Once you have read your favourite book could you turn this into an animated e-book using Scratch Jr? The app is free and available on iOS, Android and Amazon tablets. You can draw your own characters, add them from pictures you have borrowed off the internet or choose from a wide selection. https://www.scratchjr.org/teach/activities Use this link to work through some example projects to get the hang of the app. Then you could use this link to start planning and creating your story. http://scratchjr.org/curricula/animatedgenres/story.pdf
- You could open and use some of your favourite computer games or apps. While you're playing with it you could think about the different instructions that you are giving the game or app and what is happening after. Could you design your own game that is similar? http://code-it.co.uk/wp-content/uploads/2019/06/KS1SpaceGameUSEMODIFYCREATE.pdf
- Children will be starting to think about 'debugging' their programs, which means to correct errors. A great resource for this is https://studio.code.org/s/course1/stage/5/puzzle/1 would be good to go back to programs they have already created or recipes and instructions that you have been following over the last few weeks and try to debug these…

Year 3/P4

*Knowing that programs and algorithms need to follow a precise **sequence** of instructions…*

- It is important to know that programs must follow a precise sequence to complete tasks. This activity from https://curriculum.code.org/csf-18/courseb/4/#my-robotic-friends-jr1 is a great game you can play at home to think about sequencing and computational thinking. Using simple instructions like up, down, left and right you can program your family to stack cups like the image here.



- If children want to continue their use of Scratch Jr at home they could draw a storyboard telling an interesting story with an introduction, problem and resolution. They could then animate this using Scratch Jr. This would help them think about a clear sequence of events as well as understanding cause and effect.
- As well as being an incredibly important aspect of programming the children explore sequences daily in their maths lessons. There are some great lessons on Nrich… https://nrich.maths.org/8941 to help children explore sequencing in more depth, as well as this great resource from Barefoot computing… https://www.barefootcomputing.org/resources/logical-number-sequences

Year 4/P5

Using repetition and decomposition in programming to improve and simplify sequences…

- Repetition is an important element of programming as it allows programs to be simplified and long blocks of code to be repeated easily. A good family activity to try at home is looking at various dances and how you can create a dance with just a few short moves, that can then be repeated in various places. Using this lesson https://curriculum.code.org/hoc/unplugged/4/ children will learn how to incorporate repetition in dance routines then they can practice this on https://studio.code.org/s/dance-2019/stage/1/puzzle/1 or Scratch - https://scratch.mit.edu/projects/341189636/editor/
- Another great way to think about repetition at home is to create a fitness app. Use this activity https://csunplugged.org/en/topics/kidbots/unit-plan/fitness-unplugged/ and the family could have your own unplugged fitness app to refer to each day. You could also research some fitness circuits to keep yourself active and then each day add another set to focus on your repetition.
- Mathematics is deeply rooted in computer science and as such the children can use repetition to think about the properties of polygons and other 2D shapes. Then challenge members of the family to draw the shapes but to guess the shape from the instructions, for example in the picture opposite what shape would it draw?

1. draw a 3 cm line
2. turn left 90 degrees
3. draw a 3 cm line
4. turn left 90 degrees
5. draw a 3 cm line
6. turn left 90 degrees
7. draw a 3 cm line

Year 5/P6

Understanding variables and selection (conditional statements) in programming…

- Selection in programming is when the computer has been told what will happen IF a condition is met. An example would be… IF hungry eat food ELSE don't eat food. A great game to play at home to understand this is 'Simon Says' it's an oldie but a goodie. Think about the conditional statements and alternating the instructions to include the ELSE condition. You could then go digital and edit this project on scratch to make your own maze game. https://scratch.mit.edu/projects/307159520/
- Another simple activity you can play is called 'Conditional Cards'. Create a few programs that depend on things like a card's suit, colour, or value to award or subtract points. You can write the program as an algorithm or a program like: IF card is red award 1 point ELSE award other team point. You can change the value each time or how you are awarding points and then see who gets the highest number of points.
- Another great game is Red light, Green light start by lining up at one end of the room with the goal of reaching the other side. You, and then the others will call out conditionals and all everyone will advance or not depending on the specific conditional statement. For example If you are wearing something green, then take a step forward or If you have the letter 'e' in your first name, then take two giant steps forward. You could Add AND, OR, AND/OR statements to the conditionals. for example: If you have brown hair AND brown eyes, then… and so on. If you want to take it digital you can work through these examples https://studio.code.org/s/course3/stage/7/puzzle/1

Year6/P7

Embed understanding of programming, while using Variables and different Input/Output…

- A variable in programming is a container which holds a value. The name of the container is the variable. A great writing activity to do with this is 'The Variable Adventure'. In it you write 6 different verbs, nouns, adjectives etc and then roll a dice to identify which one will be chosen. Write a simple story for example: *My name is **NOUN** and I like to **VERB** **NOUN** at the weekends. My favourite animal is a **ADVECTIVE** **NOUN***. See how many different crazy stories you can create.
- Another game that incorporates music is Slap, Clap, Snap. It's a simple race that gives you a chance to practice the concept of using variables to vary the actions of code. There are three variables: Slap (player slaps their thighs or table), Clap (player claps their hands) and Snap (player snaps their fingers). You assign values to each of these movement variables, and then the players work together to try to show those values to the rest of the group. Each of these movements takes a number that tells the player how many times to slap, clap, or snap. You can find more information here. https://minecraft.makecode.com/courses/csintro/variables/unplugged
- An activity mentioned earlier is a great example of how Inputs and Outputs work. Someone becomes the Input – giving instructions verbally. Everyone else becomes the Output. The output needs a pencil and a piece of paper. The input thinks of instructions to draw a 'crazy character' for example: draw two ears, three eyes etc. The outputs will be the completed drawing. Now try to compare and see if you can improve the instructions. Some more information here https://www.barefootcomputing.org/resources/crazy-character-algorithms.

There are a huge selection of activities that can be completed on line to help practice these concepts if you want to get digital and creative. The sites are listed below. These are completely free and do not require registration (unless you wish to save). With Scratch Jr an app download is necessary.

Scratch Jr – Ideas and tutorials available here - https://www.scratchjr.org/teach/activities

Scratch Online - Ideas and tutorials available here - https://scratch.mit.edu/ideas

Code.org – There is a selection of free 'unplugged' activities as well as levels that can be worked through steadily. The site is American - https://studio.code.org/courses