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Medium term plan
Cycle 1, Term 5
ICT

Subject: Purple Mash unit 1.7 Coding
Key Concept/ Theme: • To understand what instructions are and predict what might happen when they are followed. • To use code to make a computer program. • To understand what object and actions are. • To understand what an event is. • To use an event to control an object. • To begin to understand how code executes when a program is run. • To understand what backgrounds and objects are. • To plan and make a computer program.
Prior Learning links: EYFS: Children have been exposed to the layout of purple mash and have had experience of using a variety of technology including interactive whiteboards, ipads and using a keyboard. **Cycle 1** Unit 1.4 Lego Builders • Algorithms • Logical decision making • Sequencing instructions • Following instructions **Cycle 2** Unit 1.5 Maze Explorers • Coding a 'turtle' • Creating programs using sequencing and repeat. • Visual use of the Logo programming language. • Program logic and structure. Unit 2.4 Questioning • Logical decision processing • Forward planning to achieve a solution

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Vocabulary:

Key Vocabulary

Action
Types of commands which are run on an object. They could be used to move an object or change a property.

Algorithm
A precise step by step set of instructions used to solve a problem or achieve an objective.

Background
The part of the program design that shows behind everything else. It sets the scene for the story or game.

Code
Instructions written using symbols and words that can be interpreted by a computer.

Command
A single instruction in a computer program.

Debug/Debugging
Finding a problem in the code and fixing it.

Event
Something that causes a block of code to be run.

Execute
To run a computer program.

Input
Information going into the computer. Can include moving or clicking the mouse, using the keyboard, swiping and tilting the device.

Instructions
Detailed information about how something should be done.

Object
An element in a computer program that can be changed using actions or properties.

Output
Information that comes out of the computer e.g. sound.

Properties
All objects have properties that can be changed in design or by writing code e.g. image, colour and scale properties.

Run
To cause the instruction in a program to be carried out.

Scale
The size of an object in 2Code.

Scene
The background and objects together create a scene.

Sound
This is a type of output command that makes a noise.

When clicked
An event command. It makes code run when you click on something (or press your finger on a touchscreen).

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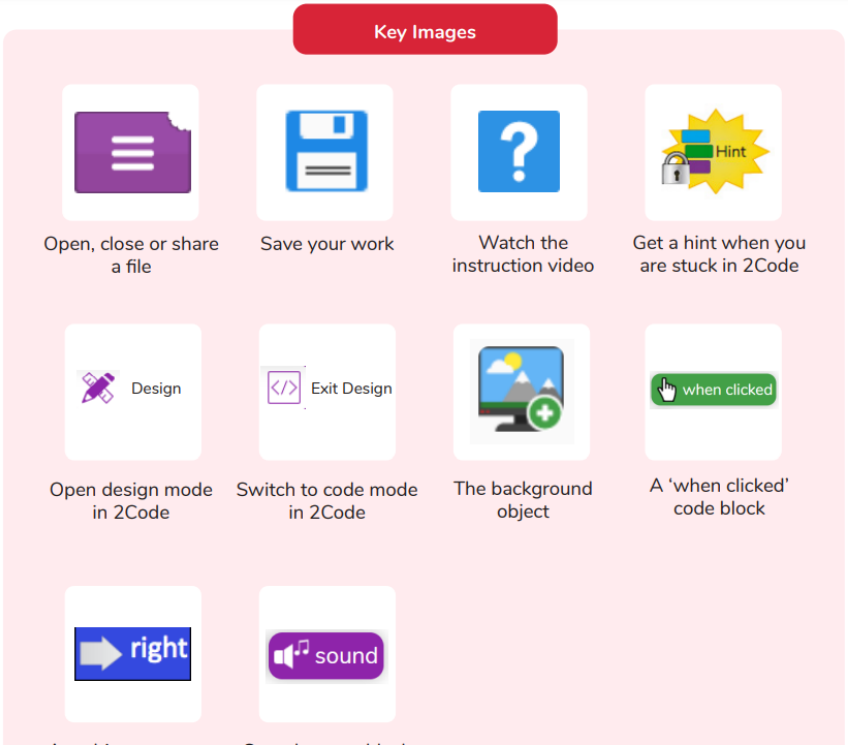
Key Images:



Resources needed for each lesson – 2dos to set.

Lesson 1:

- Code Block Cards. Children will need to use a few copies of each picture to create code away from the computer.
- Optional: Individual Whiteboards

Lesson 2:

- Code block cards from Lesson 1.
- Fun with Fish Activity.
- Optional: Exercise books to be used as 2Code workbooks for recording coding exercises and designs.

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<table>
<tr><td colspan="2">Lesson 3:

• A pot of bubbles and a bubble wand (usually part of the lid!)

• Bubble Coding: set as a 2Do

• Example Code

Lesson 4:

• Air Traffic Control.

• Haunted Scene.

Lesson 5:

• Free Code Scenes.

• Air Traffic Control.

Lesson 6:

• Free Code Scenes Backgrounds

• Free Code Scenes</td></tr>
<tr><td>1.

Unit 1.7

Lesson 1</td><td>Deeper learning question: What happens when we don’t follow instructions? Why do we need instructions?

Reconnection: Remind children of online safety rules. Go over previous words encountered in previous units.

LO: • To understand what instructions are. • To predict what will happen when instructions are followed. • To understand that computer programs work by following instructions called code.

Activity: Go over new vocab for lesson

Use the slide to explain to the children that they are going to learn about Computer Programming, which is sometimes also known as Coding. Ask them if they know what this is. Discuss briefly that it is the way that computer programmers input instructions into computers to create programs. Can they give any examples of computer programs that they have used?</td></tr>
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	Use the slide to share the first activity - Choose two children; one is a robot, and the other is a programmer. The programmer needs to direct the robot to walk from one place in the classroom to another. How can they give the instructions so that the robot does not crash into objects in the way? Repeat a few times in different locations. Explain to the children that you are now going to be the programmer and they are all the robots. Reveal the instructions on the board as symbols. Get children to 'act' out/ follow the instructions you have displayed as symbols – a twirl, a hand next to a toe and a hand next to an ear - the children should twirl, touch their toes then touch their ears. Display the slide showing a hand next to an up arrow and see if the children can see that this would be 'hand up'! Ask children to use small whiteboards draw symbols for 'hand down', what about touch nose? Now that children have practised receiving instructions in code represented as symbols, reiterate the introduction using this slide. Explain that a coder writes instructions in code for the computer to follow, this is called the input. These instructions make our programs work, our programs are known as an output. Discuss what you can see on the slide: three fish in the sea. Ask children what they think those fish could be programmed to do. Show the children the code on the slide. Explain that these are examples of **code** used to program a computer. Can they suggest ways to combine the cards to make **instructions**? Pair up the children and give the pairs some printed out Code Block Cards. Challenge them to join two blocks to give one clear **instruction** (i.e. tuna - left). Child one should lay out a line of code by joining blocks, then Child two should 'read' the line of code and explain what the **code** would do. Repeat, swapping roles. Explain to the children that the light blue code blocks represent **objects**, and the dark blue code blocks represent **actions.** This set of instructions can be called an **algorithm**. Can they say the word **algorithm?** Review Lesson vocab. **Extension: think of a simple task and write a simple code for completing it.**
2. Unit 2,6 Lesson 2	**Deeper learning question**: how do we unpick a code? What could go wrong? **Reconnection:** Remind children of online safety rules. Go over previous words encountered in previous units. **LO**: • To use code to make a computer program. • To understand what objects and actions are.

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	Activity: Go over new vocab for lesson Remind the children about the blocks of **code** that they were using last lesson. Explain that today they are going to be coding on the computers using blocks of **code**. Remind them what an **algorithm** is. Ask them to identify **objects** and **actions**. Use the slide to introduce the term **Command**. Explain that a single instruction is called a **command**. Open Purple Mash and go to 2Dos, click on Preview within the Fun with Fish 2Do to show children the Fun with Fish lesson. Open Stage 1 and click on OK to close the instruction screen. Click on 'Design' (in the top right-hand corner) and discuss what can be seen – a fish in the sea. Explain to children that they will use 2Code to program the object (fish) to do an action (move right). Click 'See Code' to go back to the code view. Open the instruction screen by clicking on the 'Question Mark' . Watch the video for stage 1. Complete stage 1 as a class; emphasise the need to give the computer clear instructions for moving the fish. The available **actions** for the fish **object** pop-up as soon as the fish is dragged into the code window. Show the children what to do if they click on the wrong direction - click on the direction again and select the correct one. Show the children where the Run button is to **run** the code and emphasise that the code has programmed the **object** to do an **action.** Show them how to move to the next stage of the activity or stop the code running to make changes. Complete stage 2 together as a class. Ask children to log in to Purple Mash, go to their 2Dos and click 'Start' on the Fun with Fish 2Do. Challenge them to complete stages 1 and 2. Ask them to use the **code** blocks to make their Tuna move and then move onto the next challenge to make the Crab move. Load stage 3 and explain that this is a stage where you must fix the code that the monkey has got wrong. We call this **debugging**. Complete this stage as a class (show children that if you want to change an action you can click on it). Children to then complete stage 3 In Purple Mash independently. Review progress together - did they get lots of code monkey stars? The maximum is 5; they lose stars for using hints. Look at stage 4 together – this is the challenge stage. All the guided activities have this challenge stage, and this is where children deepen their understanding of the **code** that they have been working on. Take a few suggestions from the class about how to improve the fish tank by adding new **objects** – fish/ crabs – add one new **object** then switch to the code screen to notice it then appears as a blue object code piece, show how to program it to move and test it out using the Run button. Review Lesson vocab.

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	Extension: crete a code that has gone wrong for a friend to unpick.
3. Unit 2,6 Lesson 3	**Deeper learning question**: Why does sound make an event better? **Reconnection:** Remind children of online safety rules. Go over previous words encountered in previous units. **LO**: • To understand what an event is. • To use an event to control an object. **Activity**: Go over new vocab for lesson Start by telling children that in this lesson they will all use **events** in their coding. See if any of them can remember and describe how an event worked in the last stage of Fun with Fish (you could bring up an example of a child's previous work to show them). Get the bubbles out! Blow bubbles. Ask children: What is the **event**? (What do you do to make something happen?) (blow bubble wand – if they just say 'blow', blow the air nowhere near the bubble wand and ask them if that works! Talk about the need for **precise instructions**). What are the **objects**? (bubble wand, bubble) What is the **action**? (float) • Show the children what the code might look like for blowing bubbles. Use the slide to talk about the **event**, **object**, **action** (touch – bubble – pop). Ask children to rearrange the **code** for that (this could be done physically with Example code printed on paper or as a drag into place activity on the board using the code on slide 7). discuss other **event** – **object** – **action** examples children might be familiar with (e.g. push – swing – swing - forward, kick – football - football – roll). Rearrange the **code** for the football example (this could be done physically using Example Code printed on paper or as a drag into place activity on the board using slide 8). demonstrate click events activity before they have a go (slide 10). Open Purple Mash and go to 2Dos, click on 'Preview' within the Bubble Coding 2Do to show children the Bubbles lesson. Look at the available code blocks available and see if children can tell you what they might see when you click to 'Design'. Referring to **event**, **object**, **action**, add code that makes a bubble move up when it is clicked on, make another bubble pop when it is clicked on. Remind children of the Run button to **run** the code. Test the **code** you have just added in together, discuss what other **code** they could add to make the other bubbles move. set children off independently on Bubbles Coding from 2Dos.

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	Review progress together as a class – using terminology event, object, action. Have any of the children noticed or tried to use the sound button? Demonstrate how it might be used so the bubble makes a sound when it pops. Review Lesson vocab. **Extension:** Challenge children to improve their program by adding sounds and then saving before exit.
4. Unit 2,6 Lesson 4	**Deeper learning question**: When have you had to debug in real life? Which skills builder does this link to? **Reconnection:** Remind children of online safety rules. Go over previous words encountered in previous units. **LO**: • To understand what an event is. • To begin to understand how code executes when a program is run. **Activity**: Go over new vocab for lesson In Purple Mash, open Air Traffic Control by clicking on 'Preview' in the 2Dos area. Watch the video for stage 1 together as a class. Remind children that there are hints if they need them, and that once they've clicked on OK they can get back to the hint by clicking on the instruction at the top. Ask children to come up to the front of the class and use the code blocks to make the plane take off when it is clicked on: Click on **Run** to test the code and see if it works as they were expecting. When you do this, notice with them that the **code** highlights orange when it **executes** (you may need to click on 'Stop' and re-run the program to point it out). Explain that if you click on the plane before the **code executes** it won't take off, they need to make sure the code **executes** first. Get children to watch the code and see what happens when you click on the planes, which bit of code **executes** when? set children off on completing stage 1 and 2 of Air Traffic control themselves. support looking at stage 3 together as a class – remind children what **debugging** is and show them how you can drag code around to move it into a different place and click on actions to change them. Fix the code together and click on Next Challenge. Remind children about the Challenge Stage and that they can add more **objects** (runways, planes, helicopters) to program. Set children off to complete the **debugging** and challenge stages. Discuss with the children what they have done this lesson using the key vocabulary.

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	Review Lesson vocab. **Extension: For children who you feel are confident, ask them to try the Haunted Scene activity. You might want to explain what a Sprite is.**
5. Unit 2,6 Lesson 5	**D Deeper learning question**: why can background make it harder? **Reconnection:** Remind children of online safety rules. Go over previous words encountered in previous units. **LO**: • To understand what backgrounds and objects are. • To understand how to use the scale attribute (property). **Activity**: Go over new vocab for lesson Load Air Traffic Control. Ask children to help you recap stages 1and 2 using key vocabulary **code, event, object, action**, **execute**. Display **slide 6**. Stop at Stage 2 and notice with the children that there are 2 planes and 2 runways and the runways have some grass around them. Explain that the runways and grass are the **background**, and that the planes are **objects** – and all together they make the **scene**. explain to children that in this lesson they will be designing a **scene**. Ask children "If you could design a scene, what would your **background** and **objects** be?" Suggest maybe… o The **background** could be the woods and a rabbit and a squirrel might be my **objects** o The **background** could be space and a rocket and an alien could be my **objects** Give the children some time with a talking partner to discuss ideas for a **scene** they might choose if they could make any program they wanted. Open Free Code Scenes by going to your 2Dos and clicking on 'Preview'. Choose a **scene** and click on 'Design' to show children the **backgrounds** and possible **objects**. Click on the menu and then 'New' to choose a different one, and look through the designs of each: - Space (Aliens, astronauts, rockets, robots) - Flowers and Fairies (Fairies, bee, ladybird) - Sky High Code (Balloon, Helicopter, Plane, Cloud, Rain, Snow, Sun, Thunder, Wind) - Spooky Code (Bat, ghost, skeleton, witch) Choose one scene from the slide together. Show children how to: - Delete an **object** (click on an **object** and then click on the bin). - Move an **object** (click on an **object** and then and drag it). - Change the size of an **object** (click on an **object** and then on the value of the **scale** to increase or decrease it).

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	Ask children to log on to Purple Mash, go to their 2Dos and start the Free Code Scenes 2Do you've set them. Ask them to choose a **scene** from the list and add, delete, move, change, copy objects until they are happy with their design. Ask children to save their **scene** when they have finished. Use the 2Dos folder to open a selection of children' designs and share and celebrate achievement. Review Lesson vocab. **Extension: create a ways you would improve your design.**
6. Unit 2,6 Lesson 6	**Deeper learning question**: why would you want to change the size of the objects. **Reconnection:** Remind children of online safety rules. Go over previous words encountered in previous units. **LO**: • To plan a computer program. • To make a computer program. **Activity**: Go over new vocab for lesson Ask children to recap what they did last lesson: - *Create a scene using backgrounds and objects.* - *Learn how to add, delete, change the size of and move objects.* Ask children to suggest what they think will happen when the program is **run** and the **code executes**. • Open Free Code Scenes and select Flowers and Fairies. Use the code blocks to program the **objects** to move, hide and speak when they are clicked on, in a way that reflects the plan. • Remind children of the click **event**, introduce children to the 'speak' action. • **Run** the program and interact with it, does it reflect the plan? Is any **debugging** needed? • Explain to children that in this lesson they are going to plan **actions** for the **objects** in their **scene**. In Purple Mash, impersonate a child and show them how to open 2Dos and click on 'Continue Work' to open their scene from last lesson. Give children a copy of the background they chose last lesson and ask them to draw on their **objects** and symbols to indicate what **actions** they will program them to do. Once they have finished their plan, children can use 2Code to program the **objects** in their **scenes** to reflect their designs. Challenge them to use the click **event**. Share children's work 2Displayboard (see Appendix 1) and have a coding show to share children's programs and celebrate achievements. Use key vocabulary from the unit to discuss how the **code** is making the program work.

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	Review Lesson vocab. **Extension: evaluate your friends design and work together to improve it.**
	End of unit quiz & reflect on gaps from the unit: Unit 1.7 Quiz – found on unit page on PM Questions: What name is given to a precise set of instructions in computing? (select one answer) Which of these is a command? Move the code blocks into their correct group. Match the code block type to an example. What is the computing term for finding a problem in the code and fixing it? Which of these icons would you click on to create a scene for a computer program? When you go into design mode, which of these can you do? Match the 2Code block types to their colour. Which of these computer programs will make a horse move right when it is clicked on? End of unit vocabulary check. Match the words learnt in this unit with their definition.
End Points:	What is coding? Writing instructions in a way that a computer can interpret them to make a program.

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Why is it useful to design before coding? It helps you to get a clear idea of what you want your program to do. You can use the design to decide which objects you need to add, what to call them and what actions they should perform.

How can you make characters move in a 2Code program? In design mode, add a character. Change properties such as the name and scale. Exit from design mode and drag your character's code block into the coding window. From the properties menu, select right, left, up or down.

Evaluation: What have the end of unit quizzes, pupil self-reflections and termly work told you about what the children can remember and recall? What are the gaps? Ensure that the areas that need further reinforcement are documented in the next subject unit MTP. **Plan in time to revisit gaps within units, determined by the quizzes.**

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