



Purple Mash Computing Scheme

Coding: External Devices

Contents

Overview

- Key Learning
- Knowledge Organiser and Learning Mat
- Concept Map and Quiz

Lesson 1: Introducing Purple Chip

- Aim
- Success Criteria
- Resources
- Preparation
- Teaching Notes

Lesson 2: Using Device Movement and Actions

- Aim
- Success Criteria
- Resources
- Preparation
- Teaching Notes

Lesson 3: Text Functions

- Aim
- Success Criteria
- Resources
- Preparation

Lesson 4: Interacting with the 'Real World'

- Aim
- Success Criteria
- Resources
- Preparation

Lesson 5: Extended Project - Part 1

- Aim
- Success Criteria
- Resources
- Preparation

Need more support? Contact us:

Tel: +44(0)208 203 1781 | Email: support@2simple.com | X: [@2simplesoftware](https://twitter.com/2simplesoftware)

Lesson 6: Extended Project - Part 2

Aim

Success Criteria

Resources

Preparation

Assessment

Overview

This unit introduces children to coding with external devices, using the Purple Chip system. Children use a version of 2Code that can interact with an external device; the Purple Chip App, loaded onto a separate device.

Children learn how to code programs which enable the Purple Chip external device to be used as a game controller as well as exploring ways that the interaction of a host device and an external device can be used in 'real world' scenarios.

Children will benefit from using a host device and an external device, although there is a simulator which can be used if there are not enough devices available.

Key Learning

- To adapt a program and operate it using Purple Chip.
- To explore how an external device can be used as a game controller.
- To use and understand different text functions on an external device.
- To create a program in which an external device can be used to monitor real world conditions.
- To design a program for the Purple Chip.
- To test and debug a program for the Purple Chip.

Knowledge Organiser and Learning Mat

These resources can be used to support learning across the unit.

- [Knowledge Organiser](#)
- [Learning Mat](#)

Concept Map and Quiz

Use these resources to gauge children's understanding before or after the unit has been taught.

- [Concept Map](#)
- [Quiz](#)

Lesson 1: Introducing Purple Chip

Aim

- To adapt a program and operate it using Purple Chip.

Success Criteria

- I can understand how Purple Chip works.
- I can adapt code, then test my program using the simulator.
- I can upload my program to an external device.

Preparation

- Ensure that the **Purple Chip App** is downloaded on the devices which will be used as external devices.
- Set **2Code Purple Chip** as a 2Do.
- Set **Walk the Dog - 2Code Example** as a 2Do.

Please find all lesson resources and additional teaching notes below.

Resources

- [Slideshow - Lesson 1](#)
- [2Code Purple Chip](#)
- [Walk the Dog - 2Code Example](#)

Teaching Notes

The Purple Chip is a way to use external devices to control a program on the computer. There are two components to a Purple Chip system:

- Purple Chip on the computer (host): this is a version of 2Code that can interact with the external device. A program runs on the computer and the external device can control the program; think of the external device like a game controller and the computer running the program as the console. The computer can also send code that will make the external device flash*, vibrate*, show text, make a sound and show an image.
- The Purple Chip app on a separate device; the Purple Chip app is available from the **Apple app store** and **Google Play store** so can be installed on apple and android devices. The device becomes the 'controller' or guest. The program can respond to taps on the screen buttons, tilting the device, shaking the device and sounds picked up by the device microphone.

Depending on the amount of devices available, it would be beneficial for half of the devices to be used as the 'host' and half of them to be used as the 'external device'. Ideally, the external device will be a tablet.

If extra devices are not always available, The Purple Chip 2Code includes a device simulator which means that children do not each need a physical external device. They can test their code using the simulator and then link it to a device when there is one available.

Instructions on how to connect the host device to the external device are found in the lesson slideshow.

*Device dependent

Lesson 2: Using Device Movement and Actions

Aim

- To explore how an external device can be used as a game controller.

Success Criteria

- I can compare an algorithm to written code.
- I can write or adapt code for a program which uses an external device as a game controller.
- I can review and debug code to ensure a program runs effectively.

Preparation

- Ensure that the **Purple Chip App** is downloaded on the devices which will be used as external devices.
- Set **Purple Frogger Game** as a 2Do.
- Print off **Purple Chicken - Algorithm** - one between two.
- Print off **Purple Chicken - Solutions** - one between two (These will also be shown in the slideshow).

Please find all lesson resources and additional teaching notes below.

Resources

- [Slideshow - Lesson 2](#)
- [Purple Frogger Game](#)
- [Purple Chicken - Algorithm](#)
- [Purple Chicken - Solutions](#)

Teaching Notes

In regards to Activity 1, Children who are very familiar with 2Code will be able to do this alone or in pairs. Children who have not used 2Code a lot would benefit from teacher guidance. The solutions document (and in the slideshow) breaks the code down into functional chunks to help teachers support children in matching code to the algorithm. Children **do not** have to understand the code in detail, especially if they are not experienced with 2Code. They **will** need to identify where to add the missing code though.

Lesson 3: Text Functions

Aim

- To use and understand different text functions on an external device.

Success Criteria

- I can understand how to program text-based interactions between a program and an external device.
- I can adapt a simple quiz that can be answered using an external device.

Preparation

- Ensure that the **Purple Chip App** is downloaded on the devices which will be used as external devices.
- Set **Example - Quiz** as a 2Do.

Please find all lesson resources below.

Resources

- [Slideshow - Lesson 3](#)
- [Example - Using Text](#)
- [Example - Quiz](#)

Lesson 4: Interacting with the 'Real World'

Aim

- To create a program in which an external device can be used to monitor real world conditions.

Success Criteria

- I can write the algorithm for a procedure that triggers an output when something is sensed.
- I can create a program that uses the sounds and motion sensors of an external device to trigger a response on a computer.

Preparation

- Ensure that the **Purple Chip App** is downloaded on the devices which will be used as external devices.
- Set **2Code Purple Chip** as a 2Do.

Please find all lesson resources below.

Resources

- [Slideshow - Lesson 4](#)
- [2Code Purple Chip](#)
- [Example - Using Text and sound](#)

Lesson 5: Extended Project - Part 1

Aim

- To design a program for the Purple Chip.

Success Criteria

- I can design a program which makes use of the Purple Chip functionality.
- I can code the program to follow my design.

Preparation

- Ensure that the **Purple Chip App** is downloaded on the devices which will be used as external devices.
- Set **2Code Purple Chip** as a 2Do.
- Print off **Storyboard Templates** in case children want to use it to plan.
- Set **2Code Game Planner** as a 2Do in case children want to use it to plan.

Please find all lesson resources below.

Resources

- [Slideshow - Lesson 5](#)
- [2Code Purple Chip](#)
- [Storyboard Template](#)
- [2Code Game Planner](#)

Lesson 6: Extended Project - Part 2

Aim

- To test and debug a program for the Purple Chip.

Success Criteria

- I can test a program which makes use of the Purple Chip functionality.
- I can debug my program so it works effectively.
- I can share my program with others.

Preparation

- Ensure that the **Purple Chip App** is downloaded on the devices which will be used as external devices.
- Set **2Code Purple Chip** as a 2Do in case children did not begin their project in the last lesson.
- Set up a **Display board** so children can share their projects with the class. Instructions on setting up a display board can be found [here](#).

Please find all lesson resources below.

Resources

- [Slideshow - Lesson 6](#)
- [2Code Purple Chip](#)

Assessment

The following information is an exemplar of what a child at an expected level would be able to demonstrate when completing this unit with additional exemplars to demonstrate how this would vary for a child with emerging or exceeding achievements.

Emerging

- With support, children can connect an external device to a 2Code program using the QR code. They can control a simple program using the device though they might not be able to fully interpret the code to work out where actions or responses originate. Children experiment with making programs that interact with the Purple Chip; they are more likely to do this through experimentation than planning a full algorithm in advance. Children can create a program that uses the Purple Chip functionality, but these may lack a full appreciation of the purpose of an external device used separately from the host. Children can give some real-world examples of the use of external devices.

Expected

- Children understand the purpose of some external devices. They can connect the Purple Chip and host device to run programs making use of the Purple Chip external device or simulator. Children know which code blocks to use to effect changes on the Purple Chip. Children can write and code simple algorithms involving an external device. Children can create programs that make use of the functionality of the external device. However, sometimes their practical application might not be fully thought through. For example, it might require the user to interact with both the host and the external device for a program to run, thereby negating the usefulness of the device. Children can give some real-world examples of the use of external devices.

Exceeding

- Children can relate the interaction of the host and Purple Chip to a range of systems that use external devices, building upon their own experience with the Purple Chip to envision other uses. Children understand the design, code, test, debug process and use this to code, appraise, and further refine their programs. Children understand the practical setup of using an external device and design accordingly, for example, they determine whether a program's function is enhanced using the chip or whether certain programs lend (or do not lend) themselves to the use of the chip. Children can give some real-world examples of the use of external devices and can propose novel uses.