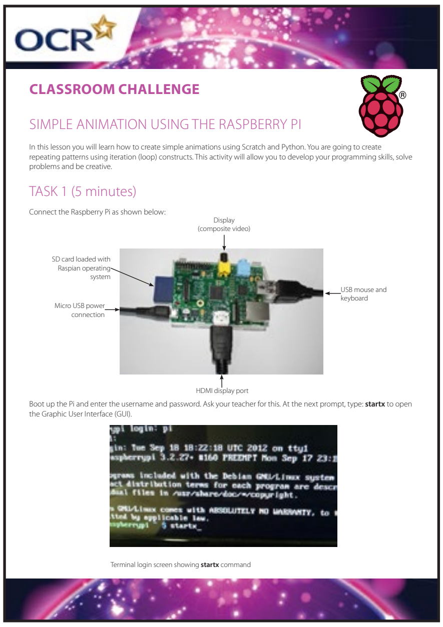
CLASSROOM CHALLENGE:
INSTRUCTIONS AND ANSWERS FOR TEACHERS

SIMPLE ANIMATION USING THE RASPBERRY PI

These instructions should accompany the OCR resource 'Simple animation using the Raspberry Pi'.

This activity allows learners to use the Raspberry Pi to produce simple graphics using Logo-like commands in both Scratch and Python.



CLASSROOM CHALLENGE

SIMPLE ANIMATION USING THE RASPBERRY PI

In this lesson you will learn how to create simple animations using Scratch and Python. You are going to create repeating patterns using iteration (loop) constructs. This activity will allow you to develop your programming skills, solve problems and be creative.

TASK 1 (5 minutes)

Connect the Raspberry Pi as shown below:

Display
(composite video)
SD card loaded with Raspian operating system
Micro USB power connection
USB mouse and keyboard
HDMI display port

Boot up the Pi and enter the username and password. Ask your teacher for this. At the next prompt, type: **startx** to open the Graphic User Interface (GUI).

```
ypi login: pi
d:
gin: Tue Sep 18 18:22:18 UTC 2012 on tty1
aspberrypi 3.2.27+ #160 PREEMPT Mon Sep 17 23:1

ograms included with the Debian GNU/Linux system
ect distribution terms for each program are descr
dual files in /usr/share/doc/*/copyright.

n GNU/Linux comes with ABSOLUTELY NO WARRANTY, to
tted by applicable law.
spberrypi ~ $ startx_
```

Terminal login screen showing **startx** command

Expected approximate duration:

Task 1 - 5 minutes

Task 2 - 10 minutes

Task 3 - 20 minutes

Task 4 - 20 minutes

Task 5 - 5 minutes

Task 6 - 20 minutes

Additional activities - 30 minutes

To complete this activity the following resources are required:

- *Raspberry Pi model A or B (B recommended)*
- *Raspian Wheezy system image on SD card (download: www.raspberrypi.org/downloads)*
- *HDMI or composite video cable and monitor*
- *Micro USB power supply*
- *USB keyboard and mouse*

TASK 1

This task requires learners to connect up the Raspberry Pi hardware, login and load the GUI (Graphic User Interface). It is recommended that user accounts are created for learners rather than using the default administrator account.

The default account settings are:

username: pi

password: raspberry

TASK 2

Learners are introduced to the Logo-type drawing commands supported by Scratch. They should plan their algorithms using pseudocode or flowcharts and then test out their ideas using Scratch. This task could generate a homework activity to undertake more detailed research into the language Logo using the provided link as a starting point.

http://el.media.mit.edu/logo-foundation/logo/index.html

TASK 3

Learners now apply their understanding of the basic shape drawing algorithm to create more shapes. More able students will be able to explore complex designs.

TASK 4

The next programming task is more sophisticated and should result in repeated coloured shapes being drawn on the screen similar to early Windows screensavers. The most able learners will be able to develop sophisticated patterns and less able students should be able to reproduce the code in the example successfully. In all programming tasks, students should be encouraged to plan and document their algorithms before they start.

TASK 5

This small activity could form a starter activity to a second lesson based on this sheet:

Command	Purpose
Clear	Clears existing drawn lines from the screen
Repeat	Creates a loop to be repeated a specified number of times
Pen up	Stops drawing mode but the turtle can still be moved
Pen down	Starts drawing mode when turtle is moved
Turn	Rotate the turtle a specified number of degrees
Move	Moves the turtle forward a specified number of steps

TASK 6

This task requires learners to use Python to run a program that produces similar output to Task 4 but using a different development environment. They are prompted to make small modifications to the code to investigate the effects. This will provide an opportunity for structured troubleshooting as learners will have a working program to compare their code with.

ADDITIONAL ACTIVITIES

These tasks are designed to inspire students to create their own designs and to increase the functionality of the current program. They could form a starter for a larger investigation.