

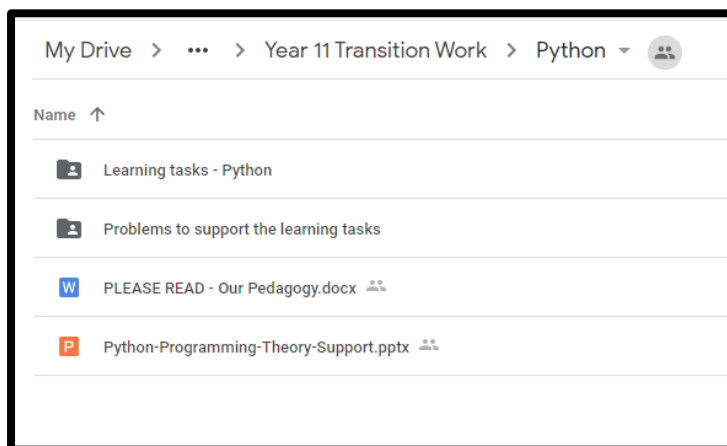
AQA A-Level Computer Science Summer Work

Your Transition work consists of:

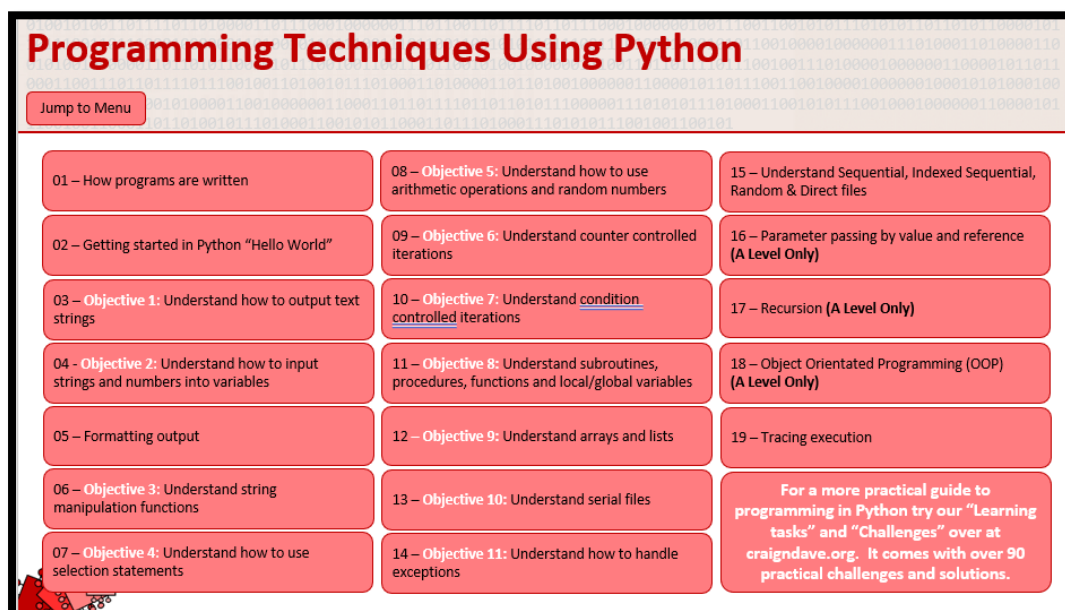
1. Programming Activities
 - a. Making sure your python knowledge is secure – We will be continuing with Python in year 12.
 - b. Learning the basics of Object Orientated Programming
2. Research Activities
 - a. Learning to make your own notes
 - b. Complete Independent Research

Programming Activities 1a – Python Knowledge

1. Download the files from
<https://drive.google.com/drive/folders/1pYzOYFv9r3lqpyLW7JKkvQE0Tm6Qxngk?usp=sharing>



2. Become familiar with the Python Techniques by completing the Interactive Presentation

A screenshot of an interactive presentation titled 'Programming Techniques Using Python'. The presentation has a red header and a 'Jump to Menu' button. The menu consists of 19 numbered items, each with a brief description of the objective. The items are arranged in a grid. The last item in the grid is a larger box with text: 'For a more practical guide to programming in Python try our "Learning tasks" and "Challenges" over at craigndave.org. It comes with over 90 practical challenges and solutions.'

You are expected to already have knowledge of using the following programming techniques:

- Printing and creating variables
- Inputting data including strings and numbers
- Make use of different data types
- Selection, using IF, ELIF, ELSE
- Random Function
- For Loops
- While Loops
- Subroutines, including procedures and functions
- Using Lists, including 1D and 2D lists (arrays)
- Writing to a file
- Reading to a file

4. Attempt the Learning Tasks for each Objective

- Getting started with Python.docx
- Objective 1 Tasks - Understand how to output text strings.docx
- Objective 2 Tasks - Understand how to input strings and numbers into variables.docx
- Objective 3 Tasks - Understand string manipulation functions.docx
- Objective 4 Tasks - Understand how to use selection statements.docx
- Objective 5 Tasks - Understand how to use arithmetic operations and random numbers.docx
- Objective 6 Tasks - Understand counter controlled iterations.docx
- Objective 7 Tasks - Understand condition controlled iterations.docx
- Objective 8 Tasks - Understand subroutines, procedures and functions.docx
- Objective 9 Tasks - Understand arrays and lists.docx
- Objective 10 Tasks - Understand serial files.docx
- Objective 11 Tasks - How to handle exceptions for validation.docx

5. Attempt the Challenges for each Objective

- Objective 01 Problems - Output text strings.docx
- Objective 02 Problems - Input strings and numbers into variables.docx
- Objective 03 Problems - String manipulation functions.docx
- Objective 04 Problems - Selection statements.docx
- Objective 05 Problems - Arithmetic operations and random numbers.docx
- Objective 06 Problems - Counter controlled iterations.docx
- Objective 07 Problems - Condition controlled iterations.docx
- Objective 08 Problems - Subroutines, procedures and functions.docx
- Objective 09 Problems - Arrays and lists.docx
- Objective 10 Problems - Serial files.docx
- Problems to extend further.docx
- Simon.docx

6. Bring the solutions to the Challenges with your next term.

Programming Activities 1b – Object Orientated Programming Technique

Learn object orientated programming principles with Future Learn Interactive Course.

<https://www.futurelearn.com/courses/object-oriented-principles>

What will you achieve?

By the end of the course, you'll be able to...

- ✓ Explore using objects in programming, and understand the difference between a function and an object.
- ✓ Demonstrate extending other people's classes, including inheritance and polymorphism.
- ✓ Collaborate by sharing your code with other people.
- ✓ Develop your understanding of how writing your own class allows you to combine functions and data.
- ✓ Produce a module to apply your learning of object oriented programming.

The next course starts on 6 April and lasts for 4 weeks.

Research Activity – Independent research using Cornell Notes System

Use the Cornell notes system: <http://coe.jmu.edu/learningtoolbox/cornellnotes.html>

Make 1 page of notes for 3 of the topics below.

For the options under number 6, each one counts as a separate topic. Use good quality websites to research the topics. Bring the notes with you next term.

Below is a list of interesting Computer Science topics.

- History of the internet
- Impact of computing society
- Why are there so many programming languages?
- History of artificial intelligence
- What is robotics?
- Impact of computing on:
 - Medicine
 - Design
 - Engineering
 - Manufacturing
 - Retail
 - Air traffic control
 - media/gaming