UPGRADE 9
Create a working example of a full adder logic gate circuit and test its operation with a series of bytes that need to be added. Report on the findings and limitations found

UPGRADE 8
Write a detailed report on how logic gates would be used to add up two nibbles using examples and explanations

UPGRADE 7
Create a truth table and logic gate circuit to solve a problem that uses both the XOR and NAND gates

UPGRADE 6
Create a truth table and circuit using a series of inputs, outputs and logic gates such as AND, OR and NOT. Show understanding of a half adder

UPGRADE 5
Work out and create truth tables for XOR and NAND by testing the inputs and outputs for those gates

UPGRADE 4
Subtract two binary numbers from each other correctly over a series of calculations and use AND, OR, NOT gates successfully in circuits

UPGRADE 3
Turn binary numbers into decimal and identify the three main logic gates (AND, OR, NOT) and their input/outputs

UPGRADE 2
Without help show how binary is used by logic gates

UPGRADE 1
With help write down the link between binary digits (1 and 0) and electrical current when used in logic circuits

UPGRADE 9

Suggest with valid reasons how the real world issues included in the cyber security quiz could have been prevented or minimised

UPGRADE 8

Use advanced tools and techniques across the questionnaire, cyber security quiz and charts for both purpose and audience

UPGRADE 7

Be creative across the questionnaire, cyber security quiz and with the use of charts in the quiz. Add information about real world cyber security attacks or incidences

UPGRADE 6

Without help, add creative and original changes to the given cyber security quiz and ensure that the information given advises the audience how to be cyber safe
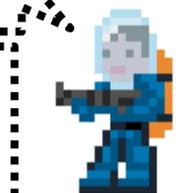
UPGRADE 5

Develop a cyber security quiz with a range of trustworthy primary and secondary information to inform an adult audience

UPGRADE 4

Collect data using a questionnaire and carefully select online information to extend and create a working cyber security quiz
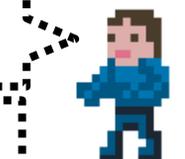
UPGRADE 3

Explain how to defend against cyber security attacks and combine at least two different online sources of information, making several questions in the cyber security quiz

UPGRADE 2

Make a new question in the cyber security quiz using information found online to inform how to be cyber safe

UPGRADE 1

Make the cyber security quiz better with some online research to say how to be safe online

UPGRADE 9
Create a presentation that predicts how Internet hardware and software will change in 5, 15 and 50 years with justifications based on how things have developed so far in history

UPGRADE 8
Create a detailed presentation to defend the following statement "the Internet has made young people lazy"

UPGRADE 7
Write a report to research what TCP, IP and FTP are before summarising how the Internet will change in the future using the researched protocols in the discussion

UPGRADE 6
Identify how the Internet will change to impact the future, its people and the way they perform tasks for home, work & leisure

UPGRADE 5
Explain how online communication software or applications and differences of Internet connections at home, school and in leisure impact your personal life and online usage

UPGRADE 4
Compare alternatives for web browsers and show the differences between circuit and packet switching to explain how the Internet works to retrieve webpages from a web server

UPGRADE 3
Describe the hardware and software used to connect to the Internet and state how it is used personally
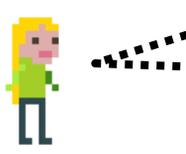
UPGRADE 2
Identify the hardware and software used to connect to the Internet

UPGRADE 1
With help write down how websites, URLs and the Internet work, briefly outlining the software and hardware used

UPGRADE 9

Extend the program to store the answer into a pickle file using your developed guide

UPGRADE 8

Investigate and write a guide on how you would store the answer from the calculator in a pickle file for later use

UPGRADE 7

Select additional code from previous lessons or extension activities and improve the calculator. Explain how the code supports the user and justify why you have used it

UPGRADE 6

Without help create a fully working calculator for the four basic mathematical operators; using clear comments for each of the lines of code to show understanding

UPGRADE 5

Refine the calculator program to have efficient examples of code and ensure that all basic mathematical operators will work

UPGRADE 4

Develop a calculator program that uses several variables to store numbers and performs at least one mathematical calculation correctly
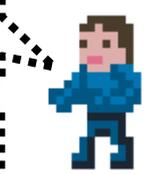
UPGRADE 3

Design and create any program that solves a problem commenting on the code to explain it

UPGRADE 2

Write a program that calculates and converts your time alive based on an input and using mathematical operators + / * -

UPGRADE 1

Be able to open up IDLE and write a simple program that takes an input and then outputs that to the screen

UPGRADE 9
Present with a high level of detail and understanding the differences between an assembler, compiler and interpreter

UPGRADE 8
Create a detailed presentation to analyse the benefits and limitations to both computes and human users for low-level languages and high-level languages

UPGRADE 7
Research and explain the differences between machine code, assembly code and high level programming languages. Describe clearly how are each processed within a computer

UPGRADE 6
Clearly explain how bit depth and sample rate affect the size and quality of a sound file

UPGRADE 5
Research how MAR, MDR, buses and cache are used in CPUs and describe how they are used to store and execute instructions

UPGRADE 4
Explain how a CPU runs instructions and works with memory. Explain how sound is represented in a computer
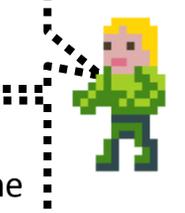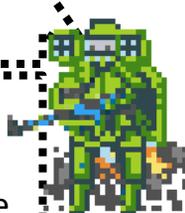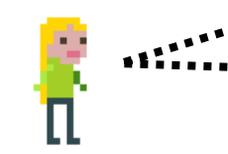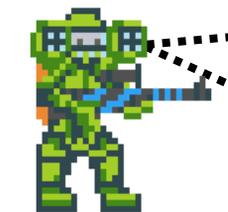
UPGRADE 3
Calculate download times and amounts of samples for sound files and describe how a CPU works

UPGRADE 2
Identify the factors that make sound files larger in size

UPGRADE 1
With help select which sound files may be bigger and identify the reasons for that

UPGRADE 9
Develop a researched presentation about how some algorithms for sorting and searching are more time efficient. Use practical experimentation to explain and justify.
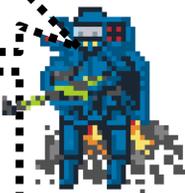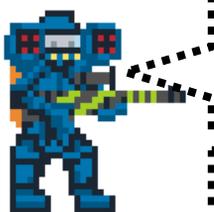
UPGRADE 8
Research the insertion sort algorithm and critically compare it against bubble and selection sorting algorithms

UPGRADE 7
Compare two sorting algorithms against each other and two searching algorithms against each other. Justify clearly which are the better algorithms
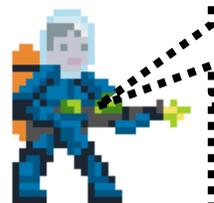
UPGRADE 6
Develop alternative algorithms for sorting (both bubble and selection) and searching (both linear and binary)

UPGRADE 5
Develop the pseudocode for a bubble sort and a linear search that could be developed into code
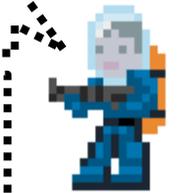
UPGRADE 4
Create algorithms; one sort (bubble, selection) and one search (linear, binary) that could be applied to data

UPGRADE 3
Explain how a bubble sort and linear search work using an algorithm
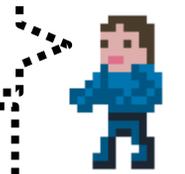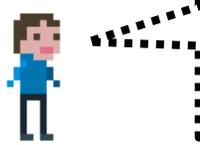
UPGRADE 2
Use a sorting or searching algorithm to work out what the outputs based on given inputs

UPGRADE 1
Identify between a search and sort algorithm and match the correct parts of the algorithm to the code

UPGRADE 9
Extend the program to store the mark book data into a pickle file using your developed guide

UPGRADE 8
Investigate and write a guide on how you would store the mark book data from the grade convertor in a pickle file for later use

UPGRADE 7
Select additional code from previous lessons or extension activities and improve the grade convertor. Explain how the code supports the user and justify why you have used it

UPGRADE 6
Without help create a fully working grade convertor with a mark book and use of subroutines; using clear comments for each of the lines of code to show understanding

UPGRADE 5
Refine the grade convertor program to have efficient examples of code using at least one subroutine

UPGRADE 4
Develop a grade convertor program that uses several variables, performs at least one mathematical calculation correctly and stores student marks in a list or array

UPGRADE 3
Design and code a solution to calculate the percentages for a marked exam commenting on the code to explain it

UPGRADE 2
Write a program that prints a menu system using a loop to control exiting the program

UPGRADE 1
Be able to open up IDLE and write a simple program that takes an input and then outputs that to the screen

UPGRADE 9

Show excellent use of; research for the reverse cypher to outline the requirements, pseudocode to design the solution, efficient coding to develop the program and secure testing to evaluate

UPGRADE 8

Analyse and develop a reverse cypher program. Evaluate and improve the code after testing

UPGRADE 7

Analyse and test the substitution cypher programs for both encryption and decryption. Develop and make an improvement to the cyphers code for both programs

UPGRADE 6

Without help design, code and improve a program to decrypt cyphertext using the substitution cypher

UPGRADE 5

Use efficient code in the decrypt program for the substitution cypher and develop an identified improvement into that code

UPGRADE 4

Develop a fully working program that uses two inputs to decrypt cyphertext for a substitution cypher. Evaluate the cypher and suggest improvements

UPGRADE 3

Design the pseudocode and then code a solution that attempts to decrypt cyphertext for a substitution cypher

UPGRADE 2

Evaluate a substitution cypher and plan how to create the code to decrypt some cyphertext using a substitution cypher

UPGRADE 1

Identify a substitution cypher by looking at the plaintext and cyphertext and state what has happened