KS3 Assessment – Year [9] Progress Grid

Subject: Computing

These are the objectives a student on each Pathway needs to achieve by the end of year 9, to ensure they are making expected progress:

	Computer Science	Information Technology	Digital Literacy
Exceptional performance	Students draw conclusions and report findings. Students decompose the functions of a physical computing system. Students test, revise, and refine the design of a project. Students can trace through programs that manipulate lists. Students can combine all of the programming features to develop solutions to meaningful problems. Students describe and assess the creative benefits and drawbacks of digital manipulation.	Students can use peer feedback to reflect on their work to make improvements.	Students compare security threats against their probability and potential impact on organisations.
Pathway 1	Students evaluate their findings to support arguments for or against a prediction. Students use the findings of their cycle investigation to support a recommendation. Students analyse visualisation to identify patterns, trends and outliers. Students combine features in a text-based programming language to develop solutions to meaningful problems. They write programs that combine components to solve meaningful problems. Students write programs that exchange messages wirelessly. Students design a physical computing artifact purposefully and implements this design. Students can form common operations in lists. They can access individual string elements and perform common operations on strings. Students trace through programs that iterate sequences using FOR and use this to iterate over lists and strings. Students can explain how the manipulation of digital images amounts to arithmetic operations. Students describe the trade-off between size and perceived quality for digital images and sound. They explain how manipulation of digital sound amounts to arithmetic operations.	Students can use proportional editing in an animation package and use the knife tool. They can use subdivision. Students can add and edit set lighting. They can set up the camera and compare the difference between render modes.	Students implement strategies to minimise the risk of data being compromised through human error. Students explain how a DDoS attack can impact users of online services. They question how malicious bots have an impact on societal issues. Students explain how networks can be protected from common security threats.
Pathway 2	Students explain how visualising data can help us identify patterns and trends. Students select criteria and use data sets to investigate predictions. They solve a problem by implementing steps of the investigative cycle on a data set. Students create a data capture form and describe the need for data cleansing. Students apply data cleansing techniques to a data set. Students select data to visualise a data set. Students can call functions and use the results they have returned in expressions. They can use selection and iteration to control program flow. They locate and correct common syntax errors. They can test and debug Python programs for the micro:bit. They write programs that use the micro:bits built in components. Students select hardware components that are fit for purpose. Students can create lists and access the elements of the list. They can use variables to keep track of counts. Students describe how digital images are composed out of individual elements and how colour can be represented as a mixture of red, green and blue, and as a sequence of bits. Students can calculate the size of bitmap image. Students define the term compression and explain why it is necessary. Students use software to perform basic image editing and sound editing tasks and combine them to solve problems. Students explain the function of microphones and speakers. They describe how sound can be represented as a series of bits. Students can calculate the size of a digital sound.	Students can use edit mode and exude in an animation. They can create useful names for objects. They can use loop cut and face editing. Students can join multiple objects together using parenting in an animation package. Students can apply different colours to different objects.	Students will explain the difference between data and information and recognise how human errors pose security risks to data. Students critique online services in relation to data privacy and explain the need for the Data Protection Act and Computer Misuse Act. They identify strategies to reduce the chance of a brute force attack being successful. Students examine how malicious bots can have a huge impact on societal issues. They identify the most effective methods to prevent cyber-attacks.
Pathway 3	Students define data science. They use software to visualise data sets and look for patterns and trends. Students recognise examples of where large data sets are used in daily life. They define the terms 'correlation' and 'outliers' in relation to data trends. They identify the steps of the investigation cycle. Students identify data needed to answer a question. Students can use an IDE to write and execute a Python program for a BBC micro:bit. Students can use variables and data structures to keep track of information. They list the built-in components for input and output. Students can describe what lists are in a program. Students recall that the colour of a each picture element is represented using a sequence of bits. They define key terms such pixel, resolution and colour depth. Students use software to perform basic image and sound editing tasks. They can recall that sound is a wave. Students define key terms such as sample, sampling rate and sample size.	Students are able to add, delete and move objects in an animation package. They can scale and rotate objects and use a material to add colour to objects. They can add, move and delete keyframes to make basic animations. Students can play, pause and move through the animation using a timeline in an animation package. Students can create a 3 to 10 second animation and render out animation.	Students identify what happens to data entered online. Students can define hacking in the context of cyber security. They can list the common malware threats