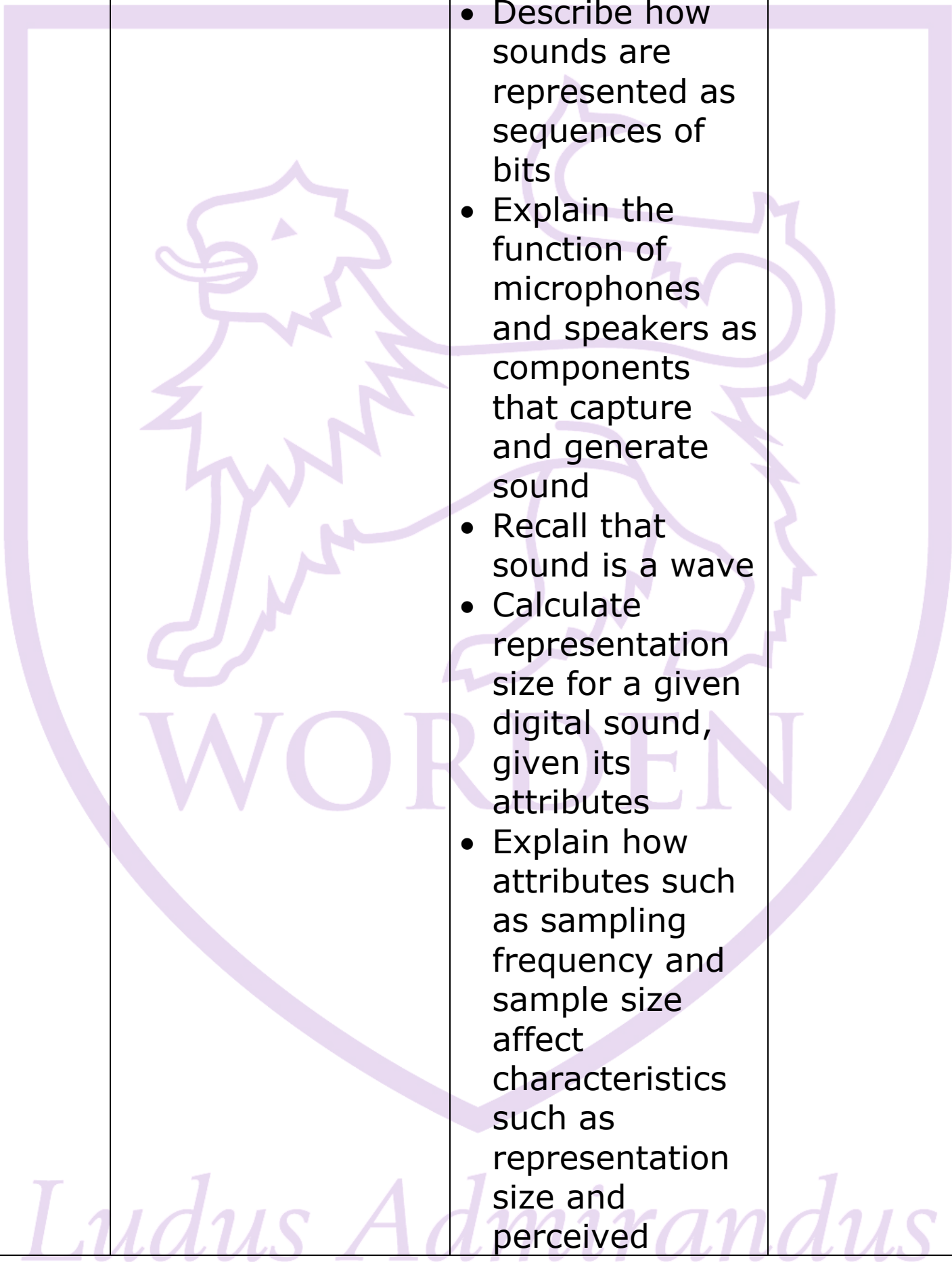## Subject: Computing

Year: 9

Topic 1 Python Programming II	Topic 2 3D Animation	Topic 3 Data Science	Topic 4 Representations	Topic 5 Cyber Security II	
• Create lists and access individual list items • Locate and correct common syntax errors • Use selection (**if-elif-else* statements) to control the flow of program execution • Write programs that display messages, receive keyboard input, and use simple arithmetic expressions in assignment statements • Perform common operations on	• Add, delete, and move objects • Scale and rotate objects • Use a material to add colour to objects • Add, move, and delete keyframes to make basic animations • Create useful names for objects • Join multiple objects together	• Define data science • Explain how visualising data can help identify patterns and trends in order to help us gain insights • Use an appropriate software tool to visualise data sets and look for patterns or trends • Evaluate findings to support arguments for or against a prediction • Recognise examples of where large	• Define key terms such as 'pixels', 'resolution', and 'colour depth' • Describe how an image can be represented as a sequence of bits • Describe how digital images are composed of individual elements • Recall that the colour of each picture element is represented using a sequence of binary digits • Compute the representation size of a digital image, by	• Critique online services in relation to data privacy • Explain the difference between data and information • Explain the need for the Data Protection Act • Identify what happens to data entered online • Implement strategies to minimise the risk of data being compromised through human error • Recognise how human errors pose security risks to data	

lists or individual items • Perform common operations on lists or individual items • Perform common operations on strings or individual characters • Use iteration (while statements) to control the flow of program execution • Perform common operations on lists or strings • Use iteration (for statements) to iterate over list items • Combine key programming language features to develop	using parenting • Play, pause, and move through the animation using the timeline • Apply different colours to different parts of the same model • Use edit mode and extrude • Use loop cut and face editing -Use proportional editing • Use subdivision • Use the knife tool - Add and edit set lighting	data sets are used in daily life • Select criteria and use data set to investigate predictions • Define the terms 'correlation' and 'outliers' in relation to data trends • Identify the steps of the investigative cycle • Solve a problem by implementing steps of the investigative cycle on a data set • Use findings to support a recommendation • Collate data from a data capture form • Identify the data needed to answer a question defined by the learner	multiplying resolution (number of pixels) with colour depth (number of bits used to represent the colour of individual pixels) • Describe how colour can be represented as a mixture of red, green, and blue, with a sequence of bits representing each colour's intensity • Describe the trade-off between representation size and perceived quality for digital images • Describe and assess the	• Define hacking in the context of cyber security • Explain how a DDoS attack can impact users of online services • Explain the need for the Computer Misuse Act • Identify strategies to reduce the chance of a brute force attack being successful • Examine how different types of malware causes problems for computer systems • List the common malware threats • Question how malicious bots can have an impact on societal issues • Compare security threats against probability and the potential impact to organisations	

solutions to meaningful problems • Use iteration (for loops) to iterate over lists and strings • Use variables to keep track of counts and sums • Apply all of the skills covered in this unit	• Compare different render modes • Set up the camera • Create a 3–10 second animation • Render out the animation	• Identify the steps of the investigative cycle • Apply data cleansing techniques to a data set • Describe the need for data cleansing • Visualise a data set -Analyse visualisations to identify patterns, trends, and outliers • Draw conclusions and report findings • Visualise a data set	creative benefits and ethical drawbacks of digital manipulation [• Explain how the manipulation of digital images amounts to arithmetic operations on their digital representation • Perform basic image editing tasks using appropriate software and combine them in order to solve more complex problems requiring image manipulation • Define key terms such as 'sample', 'sampling frequency/rate', 'sample size'	• Explain how networks can be protected from common security threats • Identify the most effective methods to prevent cyberattacks

			• Describe how sounds are represented as sequences of bits • Explain the function of microphones and speakers as components that capture and generate sound • Recall that sound is a wave • Calculate representation size for a given digital sound, given its attributes • Explain how attributes such as sampling frequency and sample size affect characteristics such as representation size and perceived	

			quality, and the trade-offs involved • Perform basic sound editing tasks using appropriate software and combine them in order to solve more complex problems requiring sound manipulation - Define 'compression', and describe why it is necessary • Recall that bitmap images and pulse code sound are not the only binary representations of images and sound available	