PACA STEM Yr 7 Curriculum

	Autumn term	Spring term	Summer term
Unit of Work	**LEGO Robotics**	**Micro:bits**	**Animation**
Fertile Questions	How can you program a robot to navigate through an obstacle course?	How can software communicate with hardware to create visual and auditory outputs?	How to use digital tools to create animations
Threshold Concepts	• Ensuring power outlets are on and checking computer light is on before trying power button to turn on computer • Using ctrl, alt and delete to get sign out option • Only turning off computers using the shutdown function on the computer • An algorithm is a set of instructions • Block coding is a visual coding language which allows users to drag and drop blocks of commands into order creating an algorithm • Sensors allow a robot to take in environmental inputs which means the program can react and change its output • How to attach a touch, ultrasonic and colour sensor to a robot	• The inputs (buttons) a Micro:bit has • The outputs (LED screen and sound box) a Micro:bit has • How to download program onto Micro:bit • Follow an algorithm in either Block coding (visual) or Python coding (text based) to create a simple program	• Gifs are a type of image that moves by looping through images • Frames are stills of an image • FPS stands for frames per second. More frames per second creates a smoother animation but also increases the size of the animation • Save animation files using web-based software that utilises cloud saving • Create animations that showcase real life response to stimuli, including bouncing ball, fight scene and moving backgrounds to show movement
Assessment	• Introduction quiz using unitTest multiple choice questions to assess what students know • End of topic assessment using miniMock	• Introduction quiz using unitTest multiple choice questions to assess what students know • End of topic assessment using miniMock	• Introduction quiz using unitTest multiple choice questions to assess what students know • End of topic assessment using miniMock
Experiences	• Creating obstacle courses • Creating an algorithm using Block coding • Download programs to robot and run those programs • Building LEGO robots using sensor attachments	• Creating an algorithm using Block coding (basic) or Python coding (advanced) • Download programs to Micro:bit and run those programs	• Create multiple animation scenes by creating a single frame and then copying and manipulating it to show movement • Use an algorithm to support creating an animation • Use web-based animation software which allows students to use it on any device (including at home) • How to save files in a cloud-based environment to find the file again
Skills	• Building spatial awareness through building and navigating obstacle courses • Problem-solving when robot program doesn't work • Resilience and patience through coding robot through obstacle course	• How to read and write algorithms • Debugging skills when program doesn't work • Resilience and patience when program doesn't work	• How to read algorithms and follow instructions to create an individual animation • Understand editing tools in animation software including copying and pasting a frame to create a seamless transition • How to access and log into a web-based software