Year 5. 3D Modelling

Prior learning links:

This is a new unit of learning for the children, although some children may have a certain level of familiarity with it through their own exploration of Purple Mash. It has been selected for this year group as it serves as an excellent introduction to a still-young industry, with easy to navigate software on Purple Mash and good links to D&T. Trials of this unit with the children previously have been very successful in that progression of skills was easily observable and both the staff and children enjoyed the activities a great deal. The unit involves the manipulation and decoration of pre-existing 3D shapes to meet different criteria throughout, which progress in challenge in each lesson.

Adaptive teaching – Recommended tried and tested practise in these lessons:

Due to the nature of Computing lessons and the common 'firefighting' required in lessons with technical issues or children who are individually confused over what may be considered small stumbling blocks, it is recommended that teachers put time and effort into reinforcing the use of school-wide learning ethos and systems (for example, the use of the 4B's – brain, board, buddy, boss) to encourage children to try to solve their problems in the right way rather than going straight to the teacher, or lessons will quickly become unmanageable. It is also recommended to follow our school's use of the Rosenshine model of mastery teaching strategy and teach lessons in a series of stages, with short, simple tasks being set, and children who finish early can be given encouragement to support and 'lifeguard' other students. This has twofold benefits; the process of teaching others cements and secures pupils' own mastery as well as ensuring the teacher isn't overwhelmed with personal requests for help. If one-to-one support is unavailable for high need children, it is a good idea to make sure these children are sat next to or near a higher ability student who may act as peer support for them, and these children are monitored carefully throughout lessons to ensure they stay on task and understand each objective given. Ensure that any hardware support that is required for individual's SEND requirements are adjusted appropriately and are tied to those students' individual log ins (e.g. Zoom tools or screen tints for students with visual impairments etc). Teachers should have a knowledge of Pupil Premium children, particularly those who have been seen to struggle in Computing lessons, and these children should be monitored alongside those with SEND during lesson time to help ensure they access lessons along with the rest of the class.

Knowledge covered:

NC	Ladders Objectives
(2.1) Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts	
(2.2) Use sequence, selection, and repetition in programs; work with variables and various forms of input and output	
(2.3) Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs	
(2.4) Understand computer networks including the Internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration.	Y5 - IT5 - I can recognise the role of computer systems in our lives
(2.5) Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.	**Y5 - IT1 (KPI)** - I am aware of several different search engines and can explain their difference (e.g: google, Bing)
(2.6) Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.	Y5 - IT2 - I can combine more than one source of information (e.g. text, picture, video, animation, sound) in my work and can present this well to other people. Y5 - IT3 - I can use software to collect, present and analyse data appropriately. I can explain what I have done to other people. Y5 - IT4 - I can create and edit a presentation to provide information clearly and can include hyperlinks in it (e.g. using PowerPoint/Sway/Keynote/Other).
(2.7) Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	

Year 5 3D Modelling

Medium Term Lesson Plan:

Lesson 1	Introducing 2Design and Make L.I To be introduced to the 2Design and Make tool **Y5 - IT1 (KPI)** Y5 – IT2 Y5 - IT3 Y5 - IT4 Y5 - IT5	S.C: know what the 2Design and Make tool is for. I can explore the different viewpoints in 2Design and Make whilst designing a building.	Key Questions *Prior knowledge* What is 3D Modelling? When might it be used? What do you know about 3D printing? What are the features of a house? What features do you observe in this image of a log cabin?	Discuss 3D modelling with the children and assess what they know about its real-world applications. Explain that the software we will be using will enable them to create a series of in 3D which will print out in the form of a net, for them to build in the final lesson. Children are introduced to the software's features, step by step. They are finally shown how to make a pattern for bricks which they can use on a 3D model of a house. Extension: adding more detail to their house and designing a log cabin.
Lesson 2	Moving Points L.I I can explore the effect of moving points when designing. **Y5 - IT1 (KPI)** Y5 – IT2 Y5 - IT3 Y5 - IT4 Y5 - IT5	S.C: I can adapt one of the vehicle models by moving the points to alter the shape of the vehicle while still maintaining its form.	Key Questions *Prior knowledge* What did we learn how to do in the last lesson? What would you still like to learn in order to do more with this software? What kind of vehicle do you want to make? What are the key features of this vehicle? What details can you add to make it look more like your vehicle?	Children are shown how to move points on an object, allowing them to change its shape. They are then shown how to change the width of models to suit their design. Children are then challenged to make their own design for a vehicle from a range of suggested options. Extension: Create two designs; one for a car and one for a transporter
Lesson 3	Designing for a Purpose L.I I can design a 3D model to fit certain criteria. **Y5 - IT1 (KPI)** Y5 – IT2 Y5 - IT3 Y5 - IT4 Y5 - IT5	S.C: I can explore how to edit the polygon 3D models to design a 3D model for a purpose	Key Questions *Prior knowledge* What did we learn how to do in the last lesson? Was there anything you wanted to be able to do with your model but didn't know how? What ideas do you have for packaging? What would make a good present for someone? What could you put inside this packaging?	Children are shown how to add and remove points to enable them to further customise their designs. They are shown a design for some packaging and are challenged to design an idea of their own. They then design their packaging, filling out the design brief. Extension: Create a more accurate human 3D figure from a basic model.
Lesson 4	Printing and Making L.I I can refine and print a model. **Y5 - IT1 (KPI)** Y5 – IT2 Y5 - IT3 Y5 - IT4 Y5 - IT5	S.C: I can refine one of their designs to prepare it for printing. I can print my design as a 2D net and then created a 3D model. I can explore the possibilities of 3D printing.	Key Questions *Prior knowledge* What skills have we learnt in this unit? Which design was your favourite? Why? How could you improve your design	Children are challenged to choose their favourite design and further refine and improve it. Children then print their design. They then construct it after some modelling. Evidence via photo/video in Seesaw. Reflect on their work and learning.