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Medium term plan
Cycle 1, Term 5
ICT

Subject: Purple Mash unit 5.6 3D Modelling

Key Concept/ Theme: • To be introduced to 2Design and Make and the skills of computer aided design. • To explore the effect of moving points when designing. • To design a 3D Model to fit certain criteria. • To refine and print a model.

Prior Learning links:

	Cycle 1	Cycle 2
Year 1/2	Unit 1.1 Exploring Purple mash • General use of Purple Mash • Design: avatar creation • Paint Projects: use of the simple paint tools Unit 2.6 Creating Pictures • 2Paint a Picture: art effects, collage effects	Unit 1.1 Exploring Purple mash • General use of Purple Mash • Design: avatar creation • Paint Projects: use of the simple paint tools Unit 1.6 Animated Story Books • 2Create a Story: Painting tool. • Animating images using built in effects • Concept of background (static) and foreground (can move)
Year 3/4		Unit 4.6 Animation • Create a stop motion animation using 2Animate • Use of art tools to create backgrounds and effects
Year 5/6	Unit 5.5 Game creator • Themed art • Art in 3D • Animating 3D characters	

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2D
Something that has only two dimensions; height and width.

3D
Something that has three dimensions; height, width and depth.

3D Printing
The action or process of making a physical object from a three-dimensional digital model, typically by laying down many thin layers of a material in succession.

CAD – Computer aided Design
A CAD computer program or app allows you to design a 3D object or environment in 2D and visualise it in 3D on the screen from many angles.

Design Brief
A document for a design project, defining the core details, including the goal and strategy.

Net
What a 3D shape would look like if it was unfolded and opened out flat.

Points
The points on a 3D net which create the corners of the 3D shape.

Pattern Fill
A tool where you can add a customised repeating pattern to the surface of the net.

Template
Something that serves as a model for others to copy and edit.

Vocabulary:

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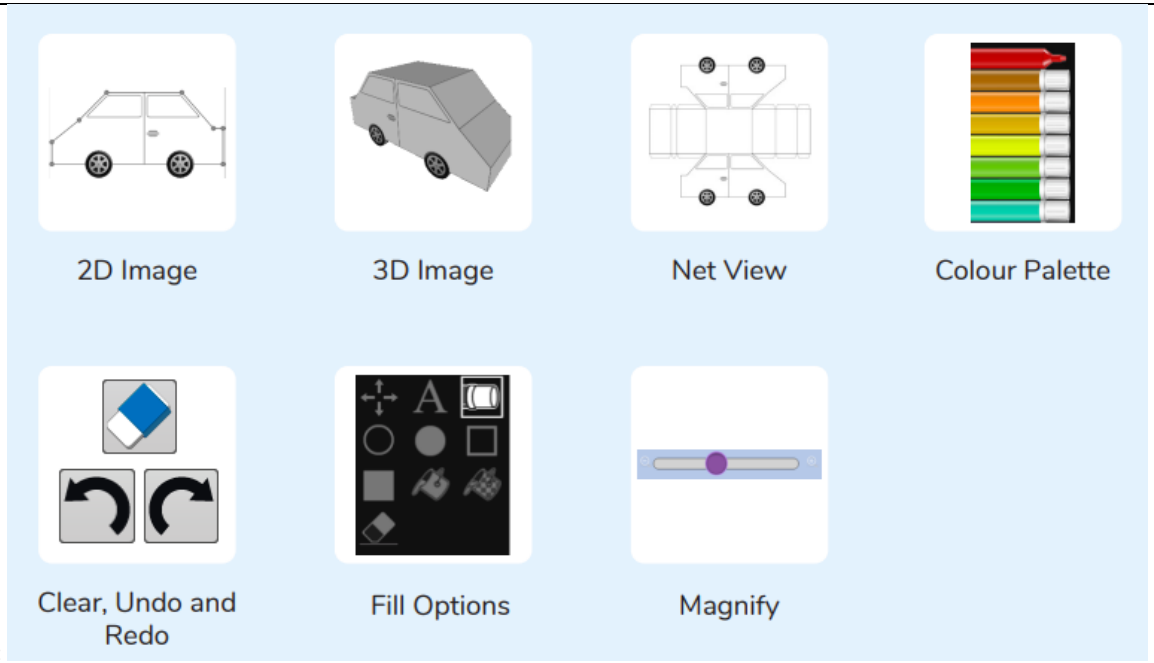
Key Images:



Resources needed for each lesson – 2dos to set.

Lesson 1:

• 2Design and Make Tool: This is found in the Tools area of Purple Mash.

Lesson 2

• 2Design and Make Tool: This is found in the Tools area of Purple Mash. • Watch the help video 'Make a 3D model' in advance to help you decide whether to show it to the class or to use it as the basis for teaching the children about the effect of moving points. This is accessed by opening 2Design and Make and clicking on the video button on the top right.

Lesson 3

• 2Design and Make Tool: This is found in the Tools area of Purple Mash. • Set the design brief activity as a 2Do for the class. The design brief asks children to upload a picture of the item if possible. Using items of which images can easily be searched for online would be helpful. You can select the following suggested computing objectives when setting the 2Do to make future assessment easier:

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Subject: Computing | Y5 | IT

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.

Lesson 4

• Access to a printer – preferably a colour one. • 2Design and Make Tool: This is found in the Tools area of Purple Mash. • Scissors and glue sticks. • If you wish to print in 3D on a 3D printer and do not have one, you can search the Internet for local 3D printing services, though this obviously has cost implications. Many secondary schools have 3D printers. You could investigate having one of the class models printed to show children that this can be done. • Video about 3D Printing (please note this is not a Purple Mash video). - https://www.youtube.com/watch?v=Vx0Z6LplaMU

1. Unit 5.6 Lesson 1	**Deeper learning questions:** **Reconnection:** Remind children of online safety rules. Go over previous words encountered in previous units. **LO:** • To be introduced to the 2Design and Make tool. **Activity:** Go over new vocab for lesson Show the class how to open 2Design and Make from the Creative Tools area of Purple Mash. Look at the different types of available templates. Today, we are starting with the house; in future lessons, we will be exploring other templates and their functions. Draw the children's attention to the features of the 2Design and Make screen. Make the 3D View the main view and show the children how to spin the model in different directions by dragging the mouse or swiping. Explore how the Net View relates to the 3D model by making the net the main view and using the drawing tool to draw on one of the surfaces. You will see the 3D View change as well.

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	Demonstrate how the children could add repeating patterns to their design by using the Pattern Fill tool. Introduce the activity. You could show children how to create a brick or tile pattern or challenge them to work it out for themselves. First clear the default pattern by using the eraser button on the Pattern Fill tool, then make a brick or tile pattern. Go over vocab and success criteria. **Extension: Amend your design to add in some more features of a house, for example: windows, doors, doorknob etc.** **Think carefully about where on the net you would need to add the features.** **How could you ensure you have straight sides and edges?** **Create a new design of a log cabin.** **How would the pattern fill tool be helpful when attempting this?** **Does the pattern need to be altered for different sides of the log cabin?**
2. Unit 5.6 Lesson 2	**Deeper learning questions:** **Reconnection:** Remind children of online safety rules. Go over previous words encountered in previous units. **LO:** • To explore the effect of moving points when designing. **Activity:** Go over new vocab for lesson watch the help video 'Make a 3D model' or use it as the basis for teaching the children about the effect of moving points. Demonstrate how to change the points on some of the different templates. Demonstrate how to use the paint tools to draw on the design. If the children struggle to work out which surface to draw on in the Net View, encourage them to try drawing a dot on the surface and then check the 3D View. They can then use the Undo control in the top right to remove the dot. Demonstrate how to change the width of a 3D model.

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	Ask the children to select a vehicle template from the choice of vehicles: van, car, bus, train, truck cab and end. They should try adapting the points to make their vehicle shape unique, encouraging the children to be as creative as they can. Go over vocab and success criteria. **Extension: Have a go at producing two vehicles: A car and car transporter. You will need to use two templates.** How could they be designed so that the car can sit on top of the transporter? What might need to be adapted on the designs? Would the car need to be narrower? Why would that be? What would be the alternative to making the car narrower?
3. Unit 5.6 Lesson 3	**Deeper learning questions:** **Reconnection:** Remind children of online safety rules. Go over previous words encountered in previous units. **LO:** • To design a 3D model to fit certain criteria. **Activity:** Go over new vocab for lesson Watch the help video called 'Adding and removing points'. This demonstrates that the polygon templates can be adapted to making alternative shapes. Today, the children are going to be designing packaging for an item. You could tell them the items to design for or they could select something themselves. Display the example which shows how different points can be added to make a creative packaging design. Ask the children to fill in the design brief activity file as they go along. To have both 2Design and Make and the activity file open together, children should open a new tab on their browser and open Purple Mash on this tab as well. They should complete the sections about the design before they start using 2Design and Make. They can then insert screen prints from their finished design afterwards. How to create screenshots will depend upon which platform you are using 2Design and Make on. One way to do so is to use the Windows Snipping tool (type 'snipping tool' in the search bar on your computer to locate this). This enables you to capture a section of the screen and save this as an image file which you can then upload to the design. On an iPad, press the Home button and the Off button at the same time. Other devices will have different methods of creating a screenshot.

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	Make sure that children save both the 2Design and Make model and their design brief information sheet Go over vocab and success criteria. **Extension: Have a go at creating a 3D human figure** **Look at the different templates available and think about how they could be adapted by adding new points.** **In the example below, it has been achieved by adding 8 points to the original angel template design.** **Can you create a 3D human figure with two legs, a more rounded head, and distinct arms? Decorate your figure to fit in with a current topic, or a character from your class novel.**
Unit 5.6 Lesson 4	**Deeper learning questions:** **Reconnection:** Remind children of online safety rules. Go over previous words encountered in previous units. **LO:** • To refine and print a model. **Activity:** Go over new vocab for lesson Give the children a chance to refine and improve one of their models from the earlier lessons. They will then be printing the net of the model and then cut, fold and stick it to make a 3D model. Children should get their design ready for printing and save it. When they are ready to print, they should click on the Print button. This creates a pdf file of the Net View, which they then need to open and print on the printer. Whilst the nets are printing talk with the children about the possibilities of 3D printing. You might wish to watch the video about how 3D printers work to show the children. PLEASE NOTE - THIS IS A YOUTUBE VIDEO AND NOT A PURPLE MASH VIDEO AND IT IS RECOMMENDED YOU CHECK IT WILL LOAD ON YOUR NETWORK. Outline how to successfully make the 3D model. Go over vocab and success criteria.

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	Extension: Spend some time now evaluating your model. You can use a blank writing template or you could create a 2Blog post. **What went well?** **How could it be improved if you were completing the task again? - Areas to consider could be planning / designing / decorating / construction.** **How sturdy is your model? Which part would your strengthen if you could?**
	End of unit quiz & reflect on gaps from the unit: Unit 5.6 Quiz – found on unit page on PM Questions: Select label for icon Why is there a blue box around this point? How can you work out which surface of a net to decorate for the desired effect? Which of these aspects of a 3D object can you change with 2Design and Make? You want to make a model of a person with trousers on. How can you use this template to do this? What can a design brief contain? What can 3D printers use to print with instead of ink? Drag the words to complete the paragraph.

End Points:

What are the different view of an object available in 2Design and Make? Net, Points and 3D.

How can the objects designed in 2Design and Make be turned into 3D objects? You can print the net and then cut and fold this into shape or you can convert the file into a format recognised by 3D printers.

How is CAD software used in industry? Give some examples. It is used to design 3D objects in a 2D environment. Some examples are; Architectural plans for buildings; designing layouts for interiors; designing objects such as packaging and designing mechanical components; designing shoes and clothing.

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Evaluation: What have the end of unit quizzes, pupil self-reflections and termly work told you about what the children can remember and recall? What are the gaps? Ensure that the areas that need further reinforcement are documented in the next subject unit MTP. **Plan in time to revisit gaps within units, determined by the quizzes.** •