DigiTech Scheme of Work

Unit 5.6 – 3D Modelling

Contents

Introduction

These lessons use the Purple Mash tool 2Design and Make.

A user guide to this tool can be found in the Guides and Resources area of Purple Mash.

These lesson plans make use of the facility within Purple Mash to set activities for children which they can then complete and hand in online (2Dos). This enables you to assess their work easily as well as distribute resources to all children. If children have not opened 2Dos before, they will need more detailed instructions for how to do this. If your children do not have individual logins for Purple Mash, we can help you with this. Contact your school Purple Mash administrator or email us at support@2simple.com.au

A teacher's guide to 2Dos can be found in the Teacher section: 2Dos Guide.

To force links within this document to open in a new tab, right-click on the link and then select 'Open link in new tab'.

Medium-Term Plan

Lesson	Title	Success Criteria
1	Introducing 2Design and Make	• Children know what the 2Design and Make tool is for. • Children can explore the different viewpoints in 2Design and Make whilst designing a building.
2	Moving Points	• Children can adapt one of the vehicle models by moving the points to alter the shape of the vehicle while still maintaining its form.
3	Designing for a Purpose	• Children can explore how to edit the polygon 3D models to design a 3D model for a purpose.
4	Printing and Making	• Children can refine one of their designs to prepare it for printing. • Children can print their design as a 2D net and then created a 3D model. • Children can explore the possibilities of 3D printing.

Lesson 1 – Introducing 2Design and Make

Aim

- To be introduced to the 2Design and Make tool.

Success Criteria

- Children know what the 2Design and Make tool is for.
- Children can explore the different viewpoints in 2Design and Make whilst designing a building.

Resources

Unless otherwise stated, all resources can be found on the main unit 5.6 page. From here, click on the icon to set a resource as a 2Do for your class. Use the links below to preview the resources; right-click on the link and 'open in new tab' so you do not lose this page.

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

Activities

Introduction	Display **slide 2** and outline the lesson aims. Display **slide 3** and outline the success criteria.
Opening 2Design and Make	Display **slide 4.** Show the class how to open 2Design and Make from the Creative Tools area of Purple Mash.
Design Templates	Display **slide 5.** 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.
Features of 2Design and Make	Display **slide 6.** Draw the children's attention to the features of the 2Design and Make screen.
Looking at 3D Models	Display **slide 7.** 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.
Net View and 3D View	Display **slide 8.** 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.
Using the Pattern Fill Tool	Display **slide 9** and demonstrate how the children could add repeating patterns to their design by using the Pattern Fill tool.
Activity 1: Creating a Brick Pattern	Display **slide 10.** 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  button on the Pattern Fill tool, then make a brick or tile pattern.
Activity 2: Extension	Display **slide 11** to give children an extension activity.
Review Success Criteria	Display **slide 12.** Review the success criteria from **slide 3.** Children could rate how well they achieved this using a show of hands.

Lesson 2 – Moving Points

Aim

- To explore the effect of moving points when designing.

Success Criteria

- Children can adapt one of the vehicle models by moving the points to alter the shape of the vehicle while still maintaining its form.

Resources

Unless otherwise stated, all resources can be found on the main unit 5.6 page. From here, click on the icon to set a resource as a 2Do for your class. Use the links below to preview the resources; right-click on the link and 'open in new tab' so you do not lose this page.

- 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 .

Activities

Introduction	Display **slide 2** and outline the lesson aims. Display **slide 3** and outline the success criteria
Making a 3D Model	Display **slide 4.** Watch the help video 'Make a 3D model' or use it as the basis for teaching the children about the effect of moving points.
Moving Points	Display **slide 5.** Demonstrate how to change the points on some of the different templates.
Using the Paint Tools on a 3D Model	Display **slide 6.** 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.
Changing the Width of a 3D Model	Display **slide 7** to demonstrate how to change the width of a 3D model.

Activity 1: Designing a Model	Display **slide 8.** 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.
Activity 2: Extension	Display **slide 9** to introduce an extension activity.
Review Success Criteria	Display **slide 10.** Review the success criteria from **slide 3.** Children could rate how well they achieved this using a show of hands.

Lesson 3 – Designing for a Purpose

Aim

- To design a 3D model to fit certain criteria.

Success Criteria

- Children can explore how to edit the polygon 3D models to design a 3D model for a purpose.

Resources

Unless otherwise stated, all resources can be found on the main unit 5.6 page. From here, click on the icon to set a resource as a 2Do for your class. Use the links below to preview the resources; right-click on the link and 'open in new tab' so you do not lose this page.

- 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.

Activities

Introduction	Display **slide 2** and outline the lesson aim. Display **slide 3** and outline the success criteria.
Adding and Removing Points - Video	Display **slide 4.** Watch the help video called 'Adding and removing points'. This demonstrates that the polygon templates can be adapted to making alternative shapes.
Activity 1: Designing Packaging	Display **slide 5.** 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 on **slide 6** which shows how different points can be added to make a creative packaging design.
Activity 2: Filling in the Design Brief	Display **slide 7.** 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. Make sure that children save both the 2Design and Make model and their design brief information sheet.
Activity 3: Extension	Display **slide 8** to introduce an extension activity.
Review Success Criteria	Display **slide 9.** Review the success criteria from **slide 3.** Children could rate how well they achieved this using a show of hands.

Lesson 4 – Printing and Making

Aim

- To refine and print a model.

Success Criteria

- Children can refine one of their designs to prepare it for printing.
- Children can print their design as a 2D net and then created a 3D model.
- Children can explore the possibilities of 3D printing.

Resources

Unless otherwise stated, all resources can be found on the main unit 5.6 page. From here, click on the icon to set a resource as a 2Do for your class. Use the links below to preview the resources; right-click on the link and 'open in new tab' so you do not lose this page.

- 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).

Activities

Introduction	Display **slide 2** and outline the lesson aim. Display **slide 3** and outline the success criteria.
Activity 1: Refining our Model	Display **slide 4.** 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.
Activity 2: Printing our Model	Display **slide 5.** 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.

What is 3D Printing?	Display **slide 6.** 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.
Activity 3: Making our 3D Model	Display **slide 7** and outline how to successfully make the 3D model.
Activity 4: Extension	Display **slide 8** to show an extension activity where the children can evaluate their models.
Review Success Criteria	Display **slide 9.** Review the success criteria from **slide 3.** Children could rate how well they achieved this using a show of hands.

Assessment Guidance

The unit overview for Year 5 contains details of national curricula mapped to the Purple Mash Units. The following information is an exemplar of what a child at an expected level would be able to demonstrate when completing this unit with additional exemplars to demonstrate how this would vary for a child with emerging or exceeding achievements.

Assessment Guidance	
Emerging	With support, children can use the ready-made templates within using 2Design and Make to design the recognisable form of a building (Lesson 1). They will evaluate, refine, edit, and adapt models to suit a design brief (Lesson 2, 3 & 4).
Expected	Children will use the ready-made templates within 2Design and Make to design the recognisable form of a building (Lesson 1). They will evaluate, refine, edit, and adapt models to suit a design brief (Lessons 2, 3 and 4). Most children can design a 3D model to fit certain criteria using a template from 2Publish. They can present their work making use of screenshots incorporated within their template (Lesson 3). Children designs demonstrate that they have considered the brief and can discuss changes they intend to make to their designs to refine them for printing (Lesson 4). Most children will invite feedback which focuses on how well their designs meet an intended purpose, explicitly, the skill of editing existing polygons.
Exceeding	Using 2Design and Make, children demonstrating great depth can use the geometric shapes and the addition of up to 24 points to design the recognisable form of a building (Lesson 1). They will evaluate, refine, edit, and adapt models to suit a design brief (Lesson 2, 3 and 4).